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. 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	Barry Bendell
Project title	Evaluation and Monitoring of Marine Protected Areas in Seagrass Meadows at Phra Thong Island, Thailand
RSG reference	11393-2
Reporting period	1 April 2012 – 30 September 2013
Amount of grant	£5962
Your email address	barrybendell@yahoo.ca
Date of this report	1 October 2013

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective Outcomes listed in proposal	Not achieved	Partially achieved	Fully achieved	Comments
1) A quantitative evaluation of the effectiveness of small MPAs in seagrass meadows at 2 villages on Phra Thong Island using a comparison between protected and non-protected areas based on:			Yes	Initially proposed to monitor invertebrates in two plots inside protected areas and plots outside, but increased that number to three each. Monitored at 3 months intervals as proposed for both inverts and seagrass throughout the period.
a) Differences in the densities of target organisms, specifically the conch *Strombus canarium* and the sea cucumber *Holothuria scabra*.			Yes	Conch numbers increased dramatically in the MPA at Tha Pae Yoi, from 1.7/100m^2 in August 2011 to 30.7/100m^2 by May 2013, less so at Lions Village. Sea cucumber numbers were generally low everywhere but observed seasonal recruitment of juveniles in non-protected areas.
b) Changes in the population size-structure of target organisms.			Yes	The sizes of conch and sea cucumber were measured at every monitoring. Conch populations in protected areas were dominated by adult *S. canarium*, which were larger in MPAs. Sea cucumbesr were largest in the MPA at Tha Pae Yoi, juveniles elsewhere.
c) Changes in seagrass composition and cover			Yes	Seagrass cover was shown to be highly variable in a seasonal pattern but monitored plots vary between years in how closely they follow that pattern.
d) Differences in the species composition and diversity of non-target organisms.			Yes	There was a dramatic fall in sea star numbers in the MPA at Lions, but how that relates to protection is unclear. Small species of conch were more abundant in unprotected areas, possibly outcompeted by protected *S. carnarium.*
2) A data set that will be part of on-going seagrass			Yes	Seagrass monitoring results are now available at Koh Phra Thong from

monitoring which can be used to evaluate future environment changes and threats, including both local environmental degradation and large-scale changes associated with climate change, such as sea level rise				2009 and all data have been forwarded to seagrass watch in Australia, where they become part of international data collection efforts.
3) Recommendations for the establishment and management of similar small-scale protected areas in small coastal communities.			Yes	The MPAs established in this study are a good example for other communities. The size appears to be adequate but areas may differ ecologically and the impacts will differ. Impacts may take years to be shown. Areas need to be well defined and demarcated.
4) A clearer understanding of the basic biology and ecology of seagrass meadows and some of the organisms associated with them on the Andaman Sea coast of Thailand.		Yes		We are only beginning to understand the more complex interactions that are occurring in seagrass meadows. It appears possible that the 3 main large inverts (*S. canarium*, *H. scabra* and the sea star *Archaster typicus*) are competing somehow for food or other resources. It is also becoming clearer that the seagrass is usually more abundant at the same time of year when the juveniles of those animals appear, and we do not understand what is driving that association and the seasonal changes.

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

The establishment of the protected areas was determined by the villagers. Ideally one would want to begin monitoring the protected areas before they were established so that there could be a "before and after" comparison. That sort of "experimental design" was not possible here as the villagers went ahead with demarcating the protected areas on their own. Similarly, at Lions village they changed the area without letting me know. So one of the plots I thought had been outside the protected area became inside. To keep the balanced design of the study, two plots were added outside protection so that there were three plots inside and three outside. The poor demarcation of the protected areas was also a problem, as they were using just styrofoam markers at first. Funding from Mangroves for the Future (MFF) allowed the village to buy more permanent buoys.

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

1) Numbers of conch increased in the protected areas, especially at Tha Pae Yoi. Irrespective of the increase in numbers, populations in protected areas had greater proportions of adults and those adults were larger in size. Very large sea cucumbers were also found at the Tha Pae Yoi site.

2) Increased numbers of juveniles outside the protected areas clearly supports the belief that the protected areas are providing a refuge for adult populations that can reproduce and disperse larvae (which are planktonic in both the conch and sea cucumber) beyond the area of protection.

3) There is near unanimous support amongst the villagers for the protected areas, and there is the perception that they are improving harvests of animals outside the protected areas.

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

The protection areas were an initiative of the communities, promoted by the elected village heads. Local people have been employed in the monitoring efforts with funds coming from this Rufford grant. As mentioned above, villagers believe that they are benefitting from improved conch harvests because of the protected areas.

5. Are there any plans to continue this work?

The protected areas will continue indefinitely. I expect to continue the monitoring over the next year, if possible. It is quite likely that we have not seen the full impacts of the protection, as the life expectancy of the conch is at least 2 years and much longer for the sea cucumber.

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

A report has been prepared on the monitoring data, which will be sent along with this report. It is still preliminary, and needs statistical analyses and the addition of scientific references etc., but will be the basis of later publications. I have sent an abstract for consideration for the Rufford grantees conference in Myanmar.

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

The funds were used throughout the 18 month period (April 2012 to September 2013) as proposed, although the monitoring is anticipated to continue for a longer period.

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 As listed in proposed budget	Budgeted Amount	Actual Amount	Difference	Comments
Project Coordinator (Barry Bendell, volunteer MAP-Asia)	2792	2792	0	
Field assistance	1489	524	965	The original estimate of the cost of field assistance was calculated as a portion of a wage for someone from off the island. However, changed to using local assistants paid on a day-to-day basis, which cost much less but got local people more involved with monitoring.
Travel between Trang and Phra Thong - bus	223	158	65	The project coordinator moved from Trang to Khuraburi late in the project and that saved on bus travel.
- boat to island	335	257	78	More trips were taken to the island but used the local public boat at less cost.
Accommodation - in Khuraburi	103	114	-10	Cost of staying overnight on mainland when needed to travel to and from island.
- on Ko Pra Thong	41	52	-11	This was mainly a portion of the water and electricity bill for housing on the island that is shared between several projects.
Meals on Phra Thong	391	462	-71	Food costs are very high on the island and a portion of those extra costs are claimed here.
Hire of boat or motorcycle between Pak Chok and Tha Payoi site	99	156	-57	This was the cost of getting to one of the monitoring sites, by motorcycle and boat, which cost more than originally expected.
50m fiberglass measuring tape for transects	37	34	3	The cost of a tape and new quadrats for seagrass monitoring, also added here miscellaneous items, like forceps.
Calipers for measuring animals	31	46	-15	Instruments for measuring animals, including calipers and a balance.
Other supplies, phone, internet, post, photocopying	31	55	-24	Others costs included photocopying data sheets, mailing data to seagrass watch, printing and laminating % cover sheets, plus internet and phone charges.
Project operation overhead cost 7%	390	390	0	This is the standard percentage taken from projects by Mangrove Action Project (MAP) for its overhead.
Total	5963	5040	923	

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

Monitoring needs to continue as further changes are likely as a result of the protection. In addition, there is great interest in rearing sea cucumbers in both villages, an activity which could be combined with conservation efforts while raising local incomes. More juvenile sea cucumbers are being seen outside the protected areas but if those animals are collected and dried they get a very low price on the market. The price is much better for large mature animals. It has been suggested that the small ones from outside protection be reared to a larger size in pens. We are currently planning to have a workshop on sea cucumber issues featuring an invited expert with experience rearing them**.**

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?

The logo has not been used as yet. RSGF has been mentioned in the written report on the monitoring, which will be attached. Also it is mentioned in an article in seagrass watch magazine about the protected area on Koh Phra Thong. I believe I sent you a copy of that, and I expect to follow up that article with one on the results of the protected areas.

11. Any other comments?

I look forward to continued work on the seagrass meadows at Koh Phra Thong and hope there will be an opportunity for continued support from the Rufford Foundation.