

## Final Project Evaluation Report

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Your Details	
Full Name	Vidlia Putri Rosady
Project Title	Reducing Mobula Ray Bycatch within Indonesia's Small-scale Fisheries using Light.
Application ID	22241-1
Grant Amount	£ 4.909,00
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Date of this Report	20 August 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
At least 75% of the local fishing community have increased knowledge and awareness about: (i) the conservation and regulatory status of mobula rays; (ii) the requirements and potential benefits of sustainable seafood markets; and (iii) the availability of bycatch mitigation technologies.				Our outreach and education programme directly targeted 576 people, including fishers, women and high school and university students. Pre- and post-training evaluations indicated that 90% of participants had increased knowledge and awareness about the issues targeted.
At least 20 fishers participate in a six-month randomized control trial to evaluate the feasibility and effectiveness of light-based bycatch reduction technologies.				Twenty fishers received training and participated in the trial, including reporting their catch and effort data for the duration of the 6-month trial.
Students from at least two fishery high schools, and national decision-makers from at least two agencies have increased awareness of bycatch mitigation technologies and the results of this project				We delivered education and outreach to 380 students from three high schools and two universities. We have reported results at one national (2 <sup>nd</sup> Indonesia Symposium for Sharks and Rays) and one international (5 <sup>th</sup> International Marine Conservation Congress) workshop. We held occasional progress meetings with the local Marine and Fishery Agency, but were unable to establish a regular schedule for these meetings. Reporting at the second national workshop targeted in our initial proposal to Rufford has not yet been achieved, and is scheduled for September 2018. We therefore consider this objective partially

			achieved.
Project communication and administration			The project was administered successfully. We have successfully communicated project via online channels, and have received project coverage in two university bulletins and one local newspaper.

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

Logbook and Port Monitoring

We collected catch and effort data using logbooks, which we encouraged fishers to fill out independently. However, we encountered a few obstacles: fishers had low literacy; completing logbooks is not an existing habit; and fishers occasionally forgot the species and weights of their catches. To overcome this we began supervising and assisting fishers to complete their logbooks every 2-3 days. This also provided a good opportunity for use to strengthen our relationship with the fishers.

We conducted port monitoring for a sample of catches, and used these data to cross-check and verify logbooks. However we had inadequate tools to accurately measure catch weights. We used scales of local middlemen to weigh catches, but these were not calibrated. To improve analysis of catch per unit effort, future studies should ensure that accurate scales are available.

Changing season

We implemented this project during the main season for this fishery. Nonetheless fishers made several adaptations due to changing conditions during this period, including changing fishing gear and the location of fishing grounds. In January 2018, two fishers began using high-intensity lights to attract sardines for capture using purse seines. Between December 2017 and March 2018 16 of the 20 fishers participating in our trial moved temporarily to Pandean, a coastal village 70km to the north of our project site.

Due to these dynamics, we updated our logbooks to ensure that fishers were correctly recording their gears used. We used cell phones to maintain contact with fishers who had relocated to Pandean and record their catches. It was not possible for us to implement port monitoring in Pandean during this project, but future plans should include this site.

Oceans users' conflict

Fishers were initially concerned that the lights attached to their gillnets would attract other fishers to their fishing grounds, and so increase competition for the resource. They also reported occasional loss of fishing gear (including the lights) due to entanglement or collision with other vessels. As a result, fishers decided to reduce the number of lights that they deployed. We had to adapt our methodologies and data analyses to account for this change.

### Awareness material

We conducted pre- and post-evaluations for every education and awareness event during this project. These evaluations allowed us to identify that our bycatch mitigation and sustainable seafood market training materials were not producing an increase in participant knowledge. We used this information to modify our materials, and to make them more relevant for the local context and the background knowledge of the participants. Our pre- and post-evaluations showed that these modifications were successful at improving participant knowledge.

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

1. Our education and outreach programme was successful, and we expanded the scope of this programme to include a women's education component. We delivered training and outreach to 96 women, 100 fishers and 386 students from three high schools and two universities. Pre- and post-evaluations showed that 90% of participants had increased knowledge about mobulid ray conservation, bycatch mitigation, and sustainable seafood markets.
2. During our 6-month pilot to evaluate the feasibility of using light to reduce mobulid bycatch, we recorded 3,620 logbook days and verified 399 landings via port sampling. Despite a small sample size of only 10 test and 10 control fishers, our data shows good indications that mobulid catches were reduced when fishers use lights. Interestingly, target catches appeared to be higher when fishers use lights. Our perception surveys provided insights into fisher's opinions about the social and economic feasibility of using lights.
3. Our project was supported by the local Marine and Fishery Agency since its earliest stages. We conducted occasional meetings with government officials to share our plans, progress and results. While we would have preferred to establish more regular coordination with this agency, nonetheless we consider it a success that these officials now have improved knowledge about mobulid conservation status, bycatch mitigation, and alternative strategies to manage their local marine biodiversity.

### **4. Briefly describe the involvement of local communities and how they have benefitted from the project.**

The local community of Muncar was closely involved throughout this project. We coordinated with and were supported by Banyuwangi Marine and Fishery Agency from the earliest planning stages of this project. We worked closely with 20 gillnet fishers, as well as delivering training and outreach to 100 fishers, 96 women and 386 students from three fishery high schools and two universities. In total, 511 community members directly benefitted from improved knowledge and awareness about mobulid conservation status, bycatch mitigation strategies, and sustainable seafood markets. The 20 fishers that participated in our pilot have benefited from training and improved knowledge about sustainable fishery practices, and have had the opportunity to evaluate and to provide feedback on the feasibility of using bycatch mitigation technologies within their fishery.

## **5. Are there any plans to continue this work?**

This project has successfully demonstrated the potential of light to reduce mobula bycatch within small scale fisheries. The fishermen also expressed their interest in continuing to evaluate tools to reduce mobulid bycatch within their fishery. With technology partners we have identified newly developed lights that can be solar-powered and that allow colours to be adjusted in the field. We intend to evaluate these devices, which appear to be more suitable for Indonesia's small-scale fisheries. We are currently planning phase two of this project, which will increase the sample size to provide a more statistically robust analysis, and aims to collaborate with a sensory biologist to identify the most effective colours to reduce mobulid bycatch. We also plan to develop our education and awareness programme, including by developing more interactive materials and empowering local students and youths as local leaders to spread knowledge about mobula conservation and sustainable fisheries.

Our future plans include: (i) communicating project findings and outcomes to date at relevant workshops and conferences; (ii) publishing scientific findings in peer-reviewed journals; (iii) developing and launching Phase 2 of this project that will include a randomised control trial to evaluate new technologies with at least 40 participating fishers, and expanding our outreach program to target at least six national universities and 1,000 coastal community members.

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

We have published regular project updates via mantawatch.com and related social media channels. The project has received media coverage by two university bulletins and one local newspaper. We have presented project results at one national (2<sup>nd</sup> Indonesia Symposium on Sharks and Rays) and one international (5<sup>th</sup> International Marine Conservation Congress) workshop. We plan to continue communicating projects results at relevant meetings and workshops, and are in the process of developing two papers for submission to peer-reviewed journals.

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

Our project was largely to schedule. Our start date was delayed due to funding and administrative delays, and this shortened our preparation time in the field. Fieldwork ran for 6 months from September 2017 to March 2018, coinciding with the main fishing season and reflecting our aligning with our initial proposal to Rufford. The delayed start date ultimately proved beneficial, and allowed more time after fieldwork was completed for analysis and reporting of results.

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.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Team training	216	187	-29	We secured a saving on training venue costs
Field equipment	139	389	+250	Additional purchase of camera to document field activities
Ground transport	544	593	+49	Additional cost to conduct rapid assessment of Pandean seasonal fishing port
Field accommodation	611	611	0	1/3 contribution towards fixed term rent
Meals and incidental expenses	1,100	1,100	0	180 person days @ IDR150, 000 per day.
Stipend for fishers	540	0	-540	We are able to secure fishers participation without stipends, and so avoid creating misaligned incentives.
Outreach and education materials	1,222	1,430	+208	Additional costs associated with expansion of outreach program to women and more schools
Results dissemination	537	599	+62	Additional costs associated with presenting the project at international conference (IMCC5)

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

We believe the following next steps are essential for lights to have an impact on reducing mobulid bycatch at scale:

1. Prepare and submit the results of this project to peer-reviewed journals;
2. Expand this trial to provide more statistically significant results;
3. Strengthen collaboration with sensory biology researchers to identify the most effective light colours to reduce mobulid bycatch;
4. Strengthen collaboration with organizations working within sustainable seafood supply chains and markets to create the strong incentives for adopting sustainable fishing practices;

5. Improve the evidence available to decision-makers to support improved regulation of mobulid bycatch and increased adoption of bycatch mitigation technologies.

**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 included the logo of the Rufford Foundation in all materials developed by the project, including outreach materials, reports and presentations. Specific examples include:

1. Posters used during education and outreach events with fishers, women and students;
2. Presentations delivered during education and outreach events with fishers, women and students;
3. Presentations delivered during progress meetings with government partners;
4. Technical reports on outreach events; and
5. Presentations delivered at national and international workshops.

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

**Vidlia Putri Rosady** has B.Sc. Marine Science from Padjadjaran University. She has over four years' experience of mobulid conservation, including undertaking a baseline study of three of Indonesia's major mobula ray fisheries, developing mobulid bycatch reduction strategies, and being selected as for the 2013 MantaWatch Internship Programme. Vidlia led the implementation of this project, including managing milestones and deliverables, training and supporting team members, monitoring and evaluating project progress, and developing collaborations with stakeholders such as government, local community, and education institutions.

**Retno Kusuma Ningrum** is an expert communicator, and was selected by the Embassy of Denmark to be an ambassador for Zero Ocean Waste in 2017. In 2016 she was selected for the MantaWatch Internship Programme, where she successfully developed communication and education programs for local schools. Retno developed innovative videos and animations to communicate conservation messages to coastal communities in Puntondo Makassar. She has B.Sc. Marine Science from University of Padjadjaran. During this project Retno create a range of education and awareness materials to communicate conservation messages to various audiences.

**Amelia Setya Nur Kumala** has B.Sc. Biology from the University of Diponogoro. She was selected for the 2016 MantaWatch Internship Programme, where she played a leading role in planning and implementing field surveys, and communicating with government partners. She has successfully led field research, including behaviour studies of Sumatran elephants as part of her undergraduate research. As the Secretary of UKSA-387 Diving Club for two years, she managed reporting and finances. During this project she coordinated research activities, including recording

fishers' logbooks, supervising port monitoring, and creating Standard Operating Procedures for deploying bycatch reduction device.

