Final Evaluation Report

Your Details	
Full Name	Agnese Mancini
Project Title	Fishers helping turtles, turtles helping fishers – Using sustainable bycatch reduction technology to reduce marine turtle mortality
Application ID	fc17cb-C
Grant Amount	14,940
Email Address	agnes@grupotortuguero.org
Date of this Report	15/02/2022

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
Participatory workshops on gear design and prototype production				We started our project with a field visit to meet with future partners, during which we explained what the project was about and how we hoped to work with local fishing communities. We also met with local authorities (for example managers of protected areas) to explain the main goals of the project and get their perspective on how to best approach the issue. We subsequently ran two large workshops (instead of four smaller ones), where we invited fishermen from different communities and local students from the Fishery Engineering department. This strategy was suggested by one of our project partners as a better one to get an overall design that would accommodate the needs of all fishermen we were going to work with. Participation was above expectations and many suggestions were made on how to design the illuminated nets to fit a variety of fisheries. Prototypes were developed by project partners and then tested in the field (see next point). One extra workshop was run in Oaxaca following an accident where more than 200 turtles got caught in a fishing net. The workshop was meant to introduce fishermen to existing initiatives aimed at working with local communities to reduce bycatch without stopping the fishery.
Improved modified fishing gear presentation (based on results from activity 1) and field				Illuminated nets were tested for 7 nights (test of lights functionality, resistance to water and harsh conditions, battery duration), while

testing				trials on turtle bycatch rates were run over 42 nights. Overall, the use of illuminated nets was positive. Results on species are currently being analysed, but so far the findings are encouraging reduction of marine turtle bycatch by 50-60%, and no major effect on some targeted species. Nevertheless, more trials are needed especially considering the variety of species that fishermen target in their fisheries. We also need to cover wider areas and include different fishing seasons to account for all variables. Generally, the solar-powered buoys solved some of the problems that were presented during the trials with LED lights: no batteries, and better manoeuvrability. However, more trials are needed as one important element to convince fishermen to switch gears is that they are able to test and see by themselves if the modifications are working.
Final gear effectiveness evaluation, adoption likelihood, and implementation assessment				We started interviews at the beginning of 2020 when the first tests were completed and results were available for sharing with the fishermen, nevertheless we had to stop with the interview process in March 2020 due to the COVID-19 contingency. We resumed interviews in January 2021, however field trips were restricted in various areas, and we had often to reschedule, therefore we were very much delayed in accomplishing this goal. Nevertheless, we managed to cover six coastal communities along the Baja peninsula and interviewed 60 fishing teams. As we were limited in our field trips, we presented the results of our project during the Grupo Tortuguero Annual meeting, which was held online. One of the teams participating in the trials presented their experience with the illuminated nets to other fishermen that are part of our network,

				We also organised two online and two in-person meetings with local authorities and community members where we were able to present results of the illuminated nets trials. We conducted an in-person training for a group of fishermen willing to test illuminated nets on turtle bycatch rates. Trials started in December 2020 and tests are still ongoing at one spot due to fishermen interest in the project. We consider this goal to be partially achieved as we could not conduct the number of surveys we wanted to conduct originally (80); however, we are currently able to go to the field and do more surveys in the coming weeks.

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

This project presented some major unforeseen difficulties:

- The first one, in time, came from changes in the way fishery trials permits were obtained. At the beginning of the project, the governmental authority that was in charge of expediting the permits went through a major restructuring process that lasted for about 6 months, therefore all permits were delayed or put on hold for longer than foreseen. This process delayed the trials and therefore the subsequent workshops and meetings to present results. However, this delay gave us an opportunity to talk about the project to a larger audience and to reach out to a larger number of people. We partnered with the local university and organised two big meetings, involving fishermen from different areas and we were able to present and get interest in the project from a group larger than the one we originally planned. The participation of fishery engineering students was a welcome bonus as it allowed us to build capacity at local level and provided an opportunity to exchange ideas with a group of stakeholders that were not originally included in the plan. One of the students is currently doing her BSc with us based on results of this project. By having one big platform at the university, we were able to gather more people in two single events, therefore getting all relevant prototype design information at once, instead of having to accommodate ideas from separated workshops.

- Another difficulty that we faced during the project was time, in the sense that anything that has to do with fishing gear modifications or gears switching took longer than what we had originally planned. As the results from the interviews show, fishermen need to have enough time to test and try the modified

fishing gears by themselves, as each fishing ground is different, and response of targeted and bycaught species will be different. Therefore, 1 year or even 1.5 years is not enough time to implement change, but through this project we had a unique opportunity to create solid relationships with fishermen at different communities, get to hear their opinions and points of view, as well as improve our fishing gear modifications. Thanks to the time we were able to spend in the field, we were able to discuss and test different settings for the illuminated nets and we also identified other potential low-cost fishing gear modifications that can mitigate bycatch of marine turtles and other species.

- Towards the end of the project, the major difficulty we encountered was obviously the COVID outbreak and all the restriction on movements that came with that. We had to suspend all field activities for about 18 months (vaccination schemes were completed by August 2021 by the majority of people within GTC, as well as community members). Some communities closed their access to outsiders to avoid contagion and due to outbreaks at different times of the year and different locations, we had to be very cautious about our field trips. Also, we decided that the priority was the wellbeing of our community partners and we focused on community needs more than project needs. However, a plan was established to resume work as soon as possible and we were able to run a decent number of interviews and run some of the workshops, either online or in person. It is important to mention that due to the nature of the subject (incidental fishery and protected species), it is not possible to carry the interviews over the phone as the personal component is very important to understand how the person being interviewed is feeling, also phone interviews do not guarantee anonymity. As for the online workshops and events, we are aware that we could not reach the same amount of people we could have reached with in person events because in some place's internet connection is slow or not available, however we managed to talk to enough people and more people will be reached with our follow-up activities (see next paragraphs).

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

1. Involving fishermen in all the steps of the process is key in identifying strategies to mitigate bycatch of endangered species; without a doubt one of the most important outcomes of this project was that fishermen were willing to participate, and more than that they showed great enthusiasm and provided more ideas of modified fishing gears to develop and test for the future. Their participation also made for the likelihood of other fishermen to adopt these modified fishing gears very high as fishermen respond better to ideas proposed by other fishermen (peer-to-peer).

2. Illuminated nets are definitely one of the ways to go if we want to reduce bycatch on a large scale. Nets are used worldwide and allow even inexperienced fishermen to catch fish; it will therefore be hard to remove nets completely. Solar-powered illuminated nets can provide a realistic alternative to regular nets and can effectively reduce bycatch of turtles and other endangered species. Having lights integrated in the net as per fishermen

design helped reduce some of the problems related to the manoeuvrability of nets using LED lights.

3. Visiting communities one by one has a snowball effect, more people want to get involved and more people want to test the modified fishing gears and get involved. This is allowing us to plan for more trials, more workshops and more interviews to cover a wider area. One key element in this process of recruiting more volunteers for the trials is to be able to present results from a 'real life' situation where fishermen can actually see data obtained from other local fishermen, which is what we were able to partially do as soon as the first trials were completed.

4. What do you consider to be the most significant achievement of this work?

The most significant achievement of this work was to create momentum to impulse for change in artisanal fishing practices, through the use of a participatory approach to design and test modified fishing gears. The project received very positive comments from many fishermen, and we were asked to visit and test communities in other areas of the Mexican Pacific coast as well. Although COVID slowed our work, we were able to build on results from this project and push for more activities to be run at a larger scale during the next 3 years. As we mentioned above, time is key when pushing for change of behaviour (in this case change in the way people normally fish), therefore being able to have more time and funds to continue this work and build and everything we learnt is fundamental to implement long-term bycatch mitigation strategies.

5. Briefly describe the involvement of local communities and how they have benefitted from the project.

Local communities were at the heart of this project, they made this project happen. Fishermen were involved since day one in the modified fishing gear design and in the tests. They were involved through participatory workshops and meeting were updates on the status and results of the project were presented. They also identified other possible modifications that can be built and tested in the future.

This project provided them with tools to fish more sustainably but also using modified fishing gears that actually reduce bycatch of endangered species will protect fishing communities from future fishery embargoes / fishery bans.

6. Are there any plans to continue this work?

Yes. We have been successfully fundraising in order to be able to run more field tests for another 3 years and at a larger scale. The idea behind this is that with a higher number of tests on different fisheries and in different areas we will be able to see if these illuminated nets can work at wide scale. We have also been in communication with representatives of more fishing communities in order to run workshops and test the modified fishing gears over a broader geographical scale.

Thanks to the collaboration with fishermen and the interviews we run towards the end of the project, we identified a series of modified fishing gears that we can test in future trials. We also identified other options, suggested by the fishing communities we worked with, to reduce bycatch by reducing the fishing effort. Some groups expressed interest in diversifying their sources of income through engaging in other activities (e.g., scientific monitoring, ecotourism, other conservation activities like mangrove restoration, and so on).

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

Results of the tests and the final design of the prototype will be presented at the Grupo Tortuguero Annual Meeting in 2020.

Our priority now is to share results with other community members, through community meetings, where and when possible. Our work will also be published in a peer-reviewed journal (in preparation) and will hopefully be presented at international meetings.

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

The project was meant to run from September 2018 to April 2020, however we have been effectively running the project from September 2018 to December 2021, with a long break in 2020 and activities restarted at a slow pace in 2021 due to COVID restrictions.

9. 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
Food / Accommodation	5040	2212	-2828	At the beginning of the project, we saw the necessity to have a person moderating the workshops and helping fishermen expressing their points of view and opinions on a subject that they consider sensitive. We therefore decided to reduce money allocated for food and accommodation

				and being able to pay for a facilitator (see below). It is also important to mention that a couple of the planned meeting were run online towards the end of the project, therefore we were able to spend less than originally planned.
Fuel	3600	3435	-165	
Internal flight	300	244	-56	
Material for workshop and trials	1200	2042	+842	We got a problem with a couple of nets being used during the trials and we decided to use money allocated for workshop material to buy them.
Surveyor / Transport	800	94	-706	Most field visits for the interviews were coupled with other activities; therefore, we were able to save money under this budget line.
PI	2000	2000		
Project assistant	2000	1598	-402	
Moderator		3177	+3177	We decided to hire a person to help us coordinate and moderate meetings at local communities due to the sensitive nature of bycatch discussions. This allowed us to obtain a socio-economic diagnostic of each community, information that helped us building subsequent actions and shaped our communication strategy.
TOTAL	**14940**	**14802**	**-138**	

***** We are presenting food and accommodation as one item as we generally bought food and accommodation from families at local communities.

** Money was converted from GBP to USD and then to MXN using the following exchange rates at the time of receiving the money: 1 GBP = 21.9042 MXN

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

More field trials are needed to test the illuminated nets and other modified fishing gears in different settings, fisheries and locations as what might help at one community may not work in the nearby area.

Organizing fishery exchange programs is also something that could provide more solutions to the bycatch issue.

Identifying partnerships with key government agencies is going to be important to make sure that changes can be implemented in the field.

11. 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?

The Rufford logo was used in all the material we prepared for the workshops and the presentations related to the project. During the Grupo Tortuguero Annual meeting, The Rufford foundation was acknowledged as one of our main partners. The RSG will also be acknowledged in future publications.

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

Dr. Jesse Senko: Arizona State University: Dr Jesse Senko has been our modified fishing gear and illuminated net expert. This project was built on his previous work with LED lights and solar-powered buoys. He provided us with prototypes to test in the field and has been supervising the field trials.

Isabel Miranda: Grupo Tortuguero de las Californias: Isabel Miranda has been instrumental in helping the PI managing the different aspects for this project, as well as supporting the team in the field.

Abigail Puppo Sanchez: a student at the Autonomous University of Baja California Sur, Abigail was in charge of conducting the interviews on BRTs and adoption likelihood. As an undergraduate student in the Fishery Engineering department, Abigail will continue to collaborate on this project to complete the interviews and support fishermen during future field trials.

Raul Velez: Socioecologist, he has a large experience working with communities and helping them solving conflicts, as well as working together to design plans. He used a SWOT (strengths, weaknesses, opportunities, and threats) method for identifying internal strengths, weaknesses, external opportunities and threats for communities to adopt new fishing techniques.

Grupo Tortuguero de las California: all the activities were run and coordinated through Grupo Tortuguero de las California (GTC), a well-established local NGO that has worked for 20 years in the region and has promoted turtle conservation among fishing communities. GTC works over 7 Mexican states in Pacific Mexico and has a network of more than 200 members, mostly fishermen, which were reached through this project while presenting at the annual meeting.

Various fishermen: throughout this project we have been collaborating with numerous fishermen in the field and during workshops, their help and ideas were invaluable for the project and provided important information to allow for this

project to continue. We would like to mention in particular Francisco Burgoin and Juan and Felipe Cuevas, as the three of them were instrumental in the testing process, as well as in the designing process.

We have also collaborated with the University of Baja California Sur (Dr Hiram Rosales in particular, who helped us organize the workshops at the local university), the national park authorities at Bahía de los Ángeles and Vizcaíno.

13. Any other comments?

This project was instrumental to get the conversation going about bycatch reduction technology and fishermen participation in bycatch reduction strategies. Thanks to the work done under this project, we have the base to work collaboratively towards more shared bycatch mitigation strategies.