

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Ma. Rica Teresa B. Dungog
<b>Project Title</b>	A Giant's Happy Meal: Whale Sharks and their Food in the Whale Shark Capital Donsol, Sorsogon
<b>Application ID</b>	20962-1
<b>Grant Amount</b>	£5000
<b>Email Address</b>	ricadungog@msi.upd.edu.ph
<b>Date of this Report</b>	01/08/19

**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
Characterize the plankton community in the waters of Donsol				Collection of samples is already complete and analyses are still ongoing.
Investigate the relationship of several physico-chemical parameters in relation to plankton community and abundance				Collection of samples is already complete and analyses are still ongoing.
Investigate the relationship of plankton density and whale shark sightings during the whale shark season in the study site				Whale shark sightings data from WWF-Philippines were already gathered and this is yet to be correlated with the plankton density in certain stations during the analysis.

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

- **Budget** - We did not anticipate the bulk of water samples for nutrient analysis and the allotted budget for the analyses was not enough. There were a total of five nutrients (nitrate, nitrite, phosphate, silicate and ammonia) measured per station at two different depths. Despite this, we pushed through with the method since these nutrients are essential in explaining the patterns of distribution and abundance of the plankton across our sampling stations. To resolve this, we requested for a meeting with the head of the laboratory where we submitted our samples. Both parties agreed that we will provide reagents and our participation in the actual analyses of our samples was a better course of action.
  
- **Weather** - Sample collection coincided with the two monsoon seasons in our country - the wet and the dry season. Before going out on field, we would always check the weather conditions, tide cycles and other pertinent environmental parameter of our study site. Since we started during the wet season, the team braved heavy rains especially that the site, Bicol Region, is located in the country's typhoon belt. Several typhoons and heavy rains brought by the southwest monsoon hit the area. We also consulted with our crewmen if it was feasible to go out when there were weather reports of heavy rain, as they were the most acquainted with the study site. During those incidents that we had to cancel the sampling, we made sure to

reschedule it within the ideal time frame in accordance with the objectives of the study.

- **Volcanic Activities** - Donsol, being situated in an area proximal to two active volcanoes, Mayon and Bulusan, is susceptible to danger during volcanic activities. During the early months of 2018, Mayon Volcano began a series of eruptions. These activities have caused several flight cancellations and people transferring to safer areas.

One team of NGOs that was supposed to conduct photo-identification of whale sharks during that season decided to transfer to another location in the interest of safety of their team. Fortunately for us, we were still able to proceed with our field works despite minimal delays in the schedule.

- **Equipment breakdown** - The breaking down of the equipment used for nutrient analyses was a major setback for our analyses. The immense number of samples were put on hold until the equipment was repaired. As of writing, all nutrient samples were already analysed.

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

- **Plankton Composition** - Nine months' worth of dataset on plankton abundance and composition may be used as baseline for creating a plankton database in Donsol. Coastal areas are expected to have high plankton density and diversity. In the case of the Donsol, it becomes extra interesting to catalogue these organisms because whale sharks feed in the area.
- **Nutrient Profile and Water movement** - Physical and chemical characteristics of the study site may provide insights on what conditions help shape the environment in which the plankton thrive. These data also provides a snapshot of the habitat in which these large filter feeders visit annually. It is a crucial information in understanding their feeding place, and possibly mating and breeding area as well.
- **Community Engagements** - The community-based ecotourism in Donsol paved the way for the betterment of the lives of the people who live there. The holistic approach of this study is to provide feedbacking seminars/workshops with community regarding the findings and outcomes of this study that can aid in the crafting of the science-based management plans for the whale sharks not only in the LGU of Donsol but also within the peripheries.

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

For 9 months, our team has employed the services of at least eight locals (consisting of Butanding Interaction Officer/s, boatmen/crew, fishermen) to assist us with our sample collection. Each month, we hired two boats: one for the plankton and

chemical samples collection manned by four crewmen, and another boat for the physical oceanography personnel with at least two crewmen.

We believe that these activities were important at the community level, specifically during the months corresponding to the off-season of whale shark sightings (September to November). The crewmen were able to have extra income from manning our sampling boats in addition to their fishing livelihood. At the same time, they also got acquainted with the scientific equipment and devices used by our team and learned more about the “plankton” as food of the “butandings”.

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

Our proposed methodology only covered 9 months' worth of sample collection and fieldwork. We firmly believe in the value of these types of observational studies and their outputs that will help answer important research questions especially if these type of studies are done on a long term and regular basis. Datasets generated by continuing this work through the years will help in tracking the changes in the immediate environment of this important whale shark hotspot in the Philippines.

If there is a chance to conduct another of this kind of work, our team will be willing to, or at the very least assist anyone or any group who wants to conduct the same studies as we did.

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

- Conduct meetings and seminars with the local government units and people's organisations in order to present key findings, particularly the link between whale sharks and the bottom of the food web and the environmental conditions affecting their interaction. We will provide this information to help as inputs in their resource management and development plans.
- Provide lectures or IEC campaigns in schools to broaden the perspective of the youth in the community about their adjacent marine environment, especially on the ecosystem of the plankton and whale sharks. Such education activities are important since in our experience of conducting high school marine science summer camps around the country, children living their lives right next to the ocean (and even those whose parents are fishers), have not even gone into the water (or know how to swim) and seen the marine habitats underneath.
- Contribute chapters of this study to the scientific community through publications in the hopes of filling in some knowledge gaps regarding the feeding of the whale sharks and the physico-chemical parameters that support it.

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

The grant was used to fund 9 months of sampling. Originally, the project was supposed to run for a year but due to budget constraints, the length of sampling was shortened into 9 months. Nonetheless, we made sure to cover the time periods of interest without sacrificing the objectives of the project.

**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. £ 1 = Php 67.00**

Item	Budgeted Amount	Actual Amount	Difference	Comments
Nutrient analyses	1500	1748	-248	Underestimation of budget allocated for nutrient analyses.
Consultation services	1500	524	976	Equipment rental was rendered free of charge. Payment was made only to the Researcher who operated on the equipment.
Boat rental	1000	1136	-136	Two boats were hired for two days per sampling month.
Travel expenses	500	1609	-1109	This line item included the budget for van hiring services.
Lodging	500	500		
<b>TOTAL</b>	<b>5000</b>	<b>5517</b>	<b>-517</b>	

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

It would be interesting to see possible changes in the plankton composition in the area.

- Increase the knowledge about plankton that would aid in promoting awareness to the people, specifically in Donsol, about their waters that are teeming with these organisms that draw whale sharks to their place.
- Update policies in relation to management of coastal and riverine area (i.e. water quality) in the Local Government Units (LGUs) of Donsol and nearby municipalities.

- Facilitate a more extensive research on the plankton and the whale sharks that will help in the betterment of its conservation programmes, as well as preparation for potential variabilities in their food source.

**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 used The Rufford Foundation logo in a thesis proposal presentation at The Marine Science Institute, University of the Philippines. We also participated during the last Rufford Small Grants Conference in Hanoi Vietnam where we presented partial results of the study.

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

**Gianina Cassandra May B. Apego** is the co-project leader of this study. She specializes on phytoplankton, one major component of this project.

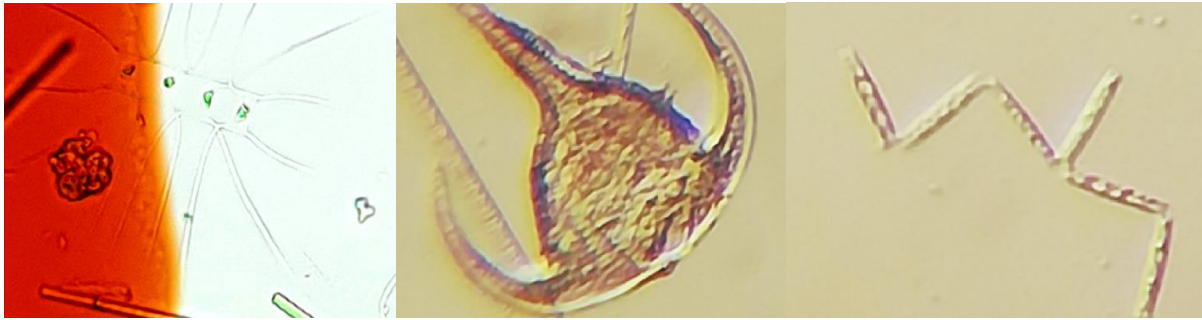
**Aletta T. Yniguez, Ph.D.** is the thesis adviser of the project leaders. She supervised the team during the duration of the project and during the analyses.

In addition to the team members, several volunteers also shared invaluable support during the conduct of this project namely: **David, Patrick Cadelina, Jay Estrella, Jake Baquiran, Michael Nada**, as well as **Andrea Pimentel** and **Maynard Matalobos** of WWF Philippines through our collaboration with them. These people volunteered to help the team for a month or so during the sampling. More importantly, the **boatmen of Donsol** assisted us during the nine-month sampling.

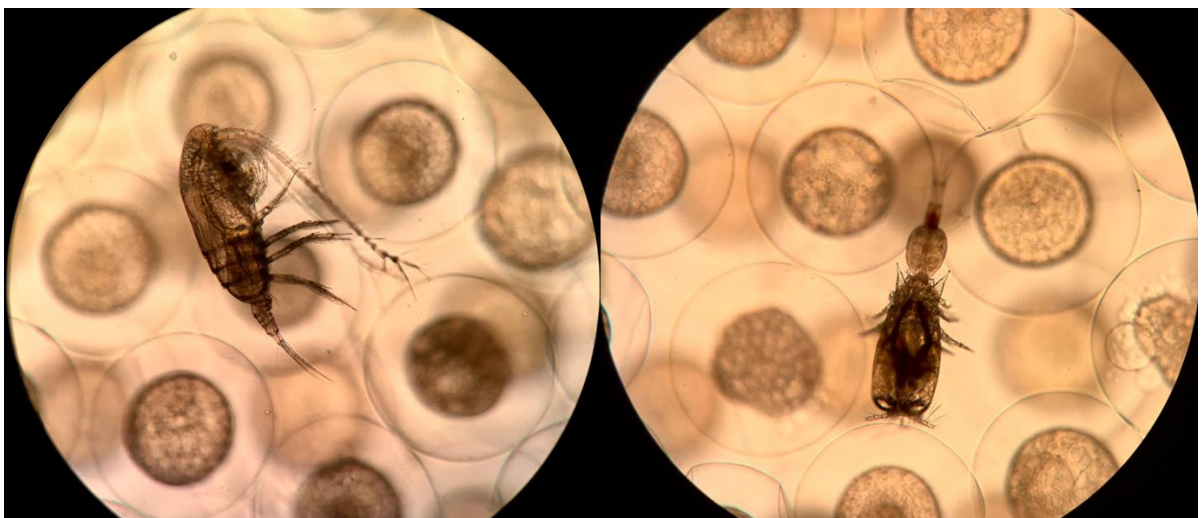
Researchers who collaborated with us during the sampling were from the Physical Oceanography Laboratory of Marine Science Institute, University of the Philippines Diliman namely: **Anabel Gammaru, Jeffrey Maloles, Jakellen Del Prado**, and **Dianne Deauna**. The researcher from the Marine Geochemistry Laboratory of the same Institute who analyzed our nutrient samples was **John Michael Aguilar**.

**12. Any other comments?**

Our team hopes that you continue to support aspiring and driven scientists and researchers to carry out and complete projects that promote plankton studies and conservation. These studies will be of invaluable contribution to the research endeavors of developing countries, especially in the Philippines. We would like to extend our deepest gratitude to Rufford Foundation for funding our project until its completion.



(a) *Chaetoceros* sp., (b) *Ceratium* sp., and (c) *Thalassionema* sp. are genera of marine phytoplankton commonly found in coastal waters. These phytoplankton are microscopic, plant-like organisms that dominate the world's oceans and contribute to global primary production. They also exist in different size classes and forms. *Chaetoceros* sp. form chains with long strand-like projections at the corners of the cells; *Ceratium* sp. have two to four horns that are either open or closed, whereas *Thalassionema* sp. are characterized by cells attached to each other at their ends. The sizes of the cells also vary with species.



These small aquatic crustaceans are zooplankton called Copepods. They are considered to be one of the most abundant multicellular organisms on Earth. Zooplankton serves as food for most marine organisms from the smallest fish up to the biggest – the whale sharks and are therefore the important link in the productivity of the ocean as a whole.



Several whale sharks seen during the season. Photographing the left side behind the 5<sup>th</sup> gill and above the pectoral fin area for the unique patterns used for photo identification.