



Fish Survey conducted at Carnaza EcoPark  
26th January 2018  
Author: Lucy Harding, Lead Science Officer



people and the sea



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## 1. INTRODUCTION

People and the Sea is a marine based conservation initiative, based on the island of Malapascua, in the Central Visayas region of the Philippines. Alongside ongoing systematic marine surveying efforts, People and the Sea regularly conduct fish surveys in the waters of Daanbantayan. This data allows us to assess the health of the coral reefs around Daanbantayan and establishes a baseline dataset, which can be used to inform and implement sustainable conservation and management plans.

As part of these efforts, on the 26<sup>th</sup> January 2018, we conducted a snorkeling fish survey within the Carnaza EcoPark bay, on Carnaza Island, Cebu (see Fig. 1.1). The survey was conducted by our Lead Science Officer, Lucy Harding, in which a 30 minute observational survey was conducted by snorkeling within the bay and recording all fish species/families observed.



**Figure 1.1:** Map of Carnaza island, Daanbantayan, with location of the January 2018 fish survey conducted by People and the Sea indicated.

The aim of this survey was to investigate the potential increase in fish biodiversity in this bay as a result of ongoing conservation efforts here, being conducted by Carnaza EcoPark. The EcoPark has protected this bay from all fishing activities for approximately 6 - 10 years. By making some basic comparisons between this location and areas outside of the bay it could be seen that the biodiversity was much higher within the bay, most likely due to these conservation efforts (see section *Findings*).

## 2. FINDINGS

A total of 41 fish species were observed during the survey (see *Table 1.1*). A number of these species are commercial species (see *Table 2.1*). One species observed is an obligate corallivore (i.e. a fish must have live coral polyps as the primary source of nutrition in its diet); the Eastern Triangle Butterflyfish. The presence of this species indicates that there is an adequate amount

of coral within the area to act as a food source for this fish species. This would imply that the reduction in fishing practices within the bay has indirectly provided protection to the coral allowing it to grow and proliferate.

**Table 2.1:** Fish species recorded within Carnaza EcoPark bay during People and the Sea fish survey (26<sup>th</sup> January 2018).

Fish species		Commercially targeted	Obligate & facultative corallivores
Gray drummer	<i>Kyphosus bigibbus</i>		
Three-spot damselfish	<i>Dascyllus trimaculatus</i>		
Humbug damselfish	<i>Dascyllus aruanus</i>		
Jewel damselfish	<i>Plectroglyphidodon lacrymatus</i>		
Staghorn damselfish	<i>Amblyglyphidodon curacao</i>		
Yellow damselfish	<i>Amblyglyphidodon aureus</i>		
Scissortail sergeant	<i>Abudefduf sexfasciatus</i>		
Reticulated dascyllus	<i>Dascyllus reticulatus</i>		
Tomato anemonefish	<i>Amphiprion frenatus</i>		
Clark's anemonefish	<i>Amphiprion clarkii</i>		
Dash-dot goatfish	<i>Parupeneus barberinus</i>		
Bluestreak cleaner wrasse	<i>Labroides dimidiatus</i>		
White streak monocle bream	<i>Scolopsis ciliatus</i>		
Long-beaked butterflyfish	<i>Chelmon rostratus</i>		+
Eightband butterflyfish	<i>Chaetodon octofasciatus</i>		
Fusilier sp.			
Twotone dartfish	<i>Ptereleotris evides</i>		
Razorfish	<i>Aeoliscus strigatus</i>		
Eastern triangle butterflyfish	<i>Chaetodon baronessa</i>		+
Panda butterflyfish	<i>Chaetodon adiergastos</i>		
Double-banded soapfish	<i>Diploprion bifasciatum</i>		
Virgate rabbitfish	<i>Siganus virgatus</i>		
Parrotfish sp.		+	
Bicolour parrotfish	<i>Cetoscarus bicolor</i>	+	
Batu coris	<i>Coris batuensis</i>		
Rockmover wrasse	<i>Novaculichthys taeniourus</i>		
Crescent wrasse	<i>Thalassoma lunare</i>		
Checkerboard wrasse	<i>Halichoeres hortulanus</i>		
Redbreasted wrasse	<i>Cheilinus fasciatus</i>		
Blackeye thicklip	<i>Hemigymnus melapterus</i>		
Checkered snapper	<i>Lutjanus decussatus</i>	+	
One spot snapper	<i>Lutjanus monostigma</i>	+	
Sixbar angelfish	<i>Pomacanthus sexstriatus</i>		
Vermiculated angelfish	<i>Chaetodontoplus mesoleucus</i>		
Pearl-scaled angelfish	<i>Centropyge vroliki</i>		
Convict surgeonfish	<i>Acanthurus triostegus</i>		
Grouper sp.		+	
Oriental sweetlips	<i>Plectorhinchus vittatus</i>	+	
Many spotted sweetlips	<i>Plectorhinchus chaetodonoides</i>	+	
Onespot emperor	<i>Lutjanus monostigma</i>	+	
Moorish idol	<i>Zanclus cornutus</i>		

The presence of these commercial species indicates that the reduction in fishing activities within the bay has allowed these species to recover to higher populations than would be found in areas which are actively fished. People and the Sea carried out a fish survey in August 2017 at the Pantao survey site; this site is subject to regular fishing primarily by local fishermen

using traditional fishing methods. At this site there was only one commercial fish species recorded (snapper sp.) and one obligate corallivorous species recorded (eastern triangular butterflyfish).

### 3. CONCLUSION

As is evidenced by the data collected during this survey, the removal of fishing pressures from within this bay has benefitted the fish populations within the local environment. The bay has a higher than average fish species biodiversity, compared to sites around the island which are under fishing pressures. This is likely due to the bay now acting as a refuge for fish. This increased protection could lead to increased reproductive capacity and reduced mortality of many fish species and the eventual restocking of the fish populations further offshore.

This increase in biodiversity will be beneficial to the local community in a number of ways:

- ✓ increased fish stocks for fishermen and local communities, providing increased income and reduced food scarcity;
- ✓ creation of sought after snorkelling area will increase revenue for the Carnaza EcoPark resort;
- ✓ positive publicity regarding beneficial conservation efforts carried out by the EcoPark will increase in-flow of 'eco-tourists' to the island, providing revenue and creating jobs for the local community; and
- ✓ reduced fishing practices within the bay has a knock-on effect of protection of the coral reef from fishing damage and pollution. Increased protection of the reef will increase the coastal protection provided by the reef, for the coastal villages and communities.

In conclusion, the active involvement of Carnaza EcoPark in conservation efforts has increased the fish diversity in the local environment, having many beneficial impacts to the island and its inhabitants. The continued effort by Carnaza EcoPark is actively encouraged and admired by People and the Sea and should be showcased as an example of the immense benefits that can arise from locally-based, small-scale conservation and management practices.

### 4. ACKNOWLEDGEMENTS

People and the Sea would like to acknowledge and thank the Osmena family for allowing us to conduct our survey within the Carnaza EcoPark.

## APPENDIX A: FISH SPECIES WITHIN CARNAZA ECOPARK.



Fig. A.1: Gray drummer (*Kyphosus bigibbus*) (Ref: <http://www.whatsthatfish.com/fish/gray-drummer/2453>)



Fig. A.2: Tomato anemonefish (*Amphiprion frenatus*). (Ref: <https://www.starfish.ch/reef/anemonefish.html>)





Fig. A.3: Long-beaked butterflyfish (*Chelmon rostratus*). (Ref: [https://en.wikipedia.org/wiki/Copperband\\_butterflyfish](https://en.wikipedia.org/wiki/Copperband_butterflyfish))



Fig. A.4: Eastern triangle butterflyfish (*Chaetodon baronessa*). (Ref: <http://fishesofaustralia.net.au/home/species/2376>)





Fig. A.5: Two-tone dartfish (*Ptereleotris evides*). (Ref: <http://www.ryanphotographic.com/ptereleotridae.htm>)



Fig. A.6: Sixbar angelfish (*Pomacanthus sexstriatus*). (Ref: <https://reeflifesurvey.com/species/pomacanthus-sexstriatus/>)