

Coral Cay Conservation Visual Assessment Report



Barangay President Quezon (Maugoc) 2018

Municipality of Liloan, Southern Leyte, Philippines

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Barangay President Quezon

Initial Assessment for President Quezon, Liloan Proposed MPA

In 2017, the assessment of the President Quezon proposed MPA site was requested by Armando Gaviola of PENRMO. After consulting with the Barangay Captain, CCC surveyed the southern end of the bay of President Quezon for the purpose of a proposed MPA. This initial assessment was conducted between July 18th and August 14th, 2017 by trained volunteer survey teams, following Underwater Visual Census (UVC) protocols. Assessment of the proposed MPA site was conducted using an enhanced Reef Check methodology which is widely recognised and used to survey coral reefs around the world. The concluding recommended MPA site is depicted in Fig. 1, in addition to the MPA coordinates in table 1. For a full report on the methodology and results of this assessment, please refer to Waters *et al.* (2018).

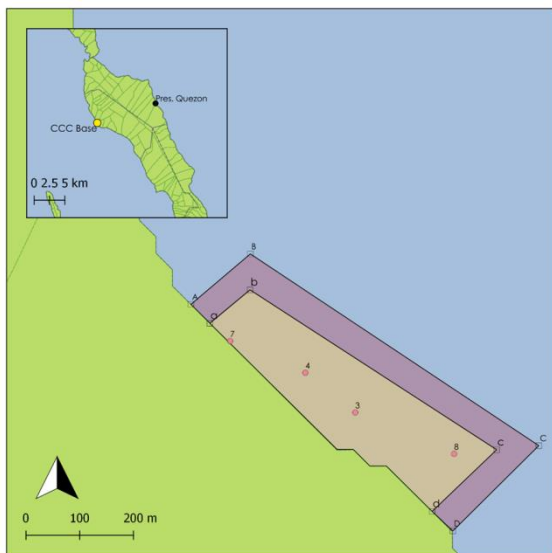


Figure 1. Original proposed boundary location for Barangay President Quezon Marine Protected Area. Purple area = Marine Reserve (MR), orange/yellow area = No-Take Area (NTA).

All recommendations are flexible, and the final designation is a result of the collaboration of CCC with the Municipality of Liloan and the local community of President Quezon, in particular the local fisherfolk. CCC provide suggestions on what is the ecological ideal but understand that there are other factors to consider during the decision making process. Combining an ecosystem approach to fisheries (EAF) and community-based management (CBM), empowering the local user group level and conferring high levels of transparency in a triangulated consortium, CCC aims to facilitate the local Barangay President Quezon in achieving measurable levels of effectiveness from their designated MPA.

Table 1. Recommended boundary coordinates for establishment of Marine Protected Area in Barangay President Quezon, 2017, given in Universal Transverse Mercator (UTM) coordinates. The boundary points indicate the corners of each zoned and should be understood further following map referral. MR = Marine Reserve; NTA = No-Take Area; MR = Marine Reserve.

Buoy	Easting (UTM)	Northing (UTM)	MPA component
A	743874	1116251	MR
B	743984	1116345	MR
C	744521	1115988	MR
D	744361	1115829	MR
a	743909	1116216	NTA
b	743984	1116278	NTA
c	744443	1115980	NTA
d	744323	1115865	NTA
NTA (ha)	7.51		
MR (ha)	4.82		
Total (ha)	12.39		

Reconsideration of placement for President Quezon, Liloan MPA

After discussions between Government officials, Barangay officials and the local community, the suggestion was made to relocate the originally proposed MPA site North, to the newly defined coordinates noted in Table 2 (Fig. 2). Consequently, an additional assessment of the relocated proposed MPA site for President Quezon was requested by Armando Gaviola of PENMRO, and the newly elected Barangay Captain of 2018. The main concerns expressed by the Captain for the newly proposed site was that the area is exposed to high levels of siltation, due to several river outputs flowing into the area. Furthermore, it was believed that the originally proposed area did in fact host a healthier reef ecosystem, although the establishment of an MPA here was not fully supported by the community. Therefore, these were the basis of conducting an RVA in the newly proposed area, in order to gain insight into the coastal zone not previously surveyed.

Although an RVA cannot form the basis of scientific recommendations for relocation, it is adequate in providing basic preliminary data, in the form of qualitative and multimedia data, which will guide further surveying if requested. CCC conducted a Rapid Visual Assessment (RVA) in the newly proposed area on September 12th 2018, in addition to a second RVA in the originally proposed area, for which media data was lacking.



Figure 2. Original (purple/orange/yellow) and newly proposed (red) boundary location for Barangay President Quezon Marine Protected Area.

Table 2. New boundary coordinates for establishment of Marine Protected Area in Barangay President Quezon, 2018, given in Universal Transverse Mercator (UTM) coordinates. The boundary points indicate the corners of each zoned and should be understood further following map referral. Area; NTA = No-Take Area.

Boundary Point	Easting (UTM)	Northing (UTM)	MPA component
A	743515	1117267	NTA
B	743790	1117353	NTA
C	744021	1116675	NTA
D	743655	1116556	NTA
Total area (ha)		23.97	

Methodology

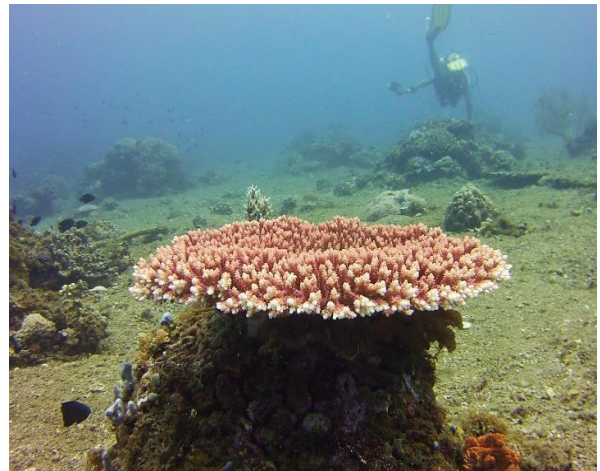
Rapid Visual Assessment (RVA)

The RVA is a preliminary protocol that is utilized by a survey team to collect anecdotal and qualitative data of the site. The qualitative data are used to support subsequent scientific reports and supplement recommendations and future survey efforts.

The RVA is broad in concept and looks at the site in general with no defined quantitative data being collected (due to During scientific and dive training with CCC participants undertake a series of training presentations and skill assessments. This is in order to obtain certification in survey methodologies to undertake biophysical assessments. An augmented REEF Check methodology is followed including target fish and invertebrate species, in addition to coral species and other substrates included in the REEF check methodology, in addition to species specific to the Philippines which can be used as good indicators of environmental health (for the full target species list, please refer to Waters *et al.* 2018). Trained divers including the Science Officer (SO) and volunteers participated in the RVA survey. Divers also recorded impacts on the reef including sightings of bleached coral colonies, coral diseases, and damage in three categories: boat/anchor, dynamite and other, in

varying survey team numbers and the resulting area (m²) covered). As a result, it enables a large area to be visually assessed within a short period of time. The RVA in design takes basic logistical elements of a Roving Diver Transect (RDT) without the defined methods and species counts and takes reference from exploratory dive procedures. Survey teams are encouraged to explore the area, collecting as many notes as possible to describe the survey site.

addition to trash being recorded into general and fishing nets/traps. All media and species observation data were collated by the Science Officer.



*A tabulate coral colony in the newly proposed area.
-Photo by Daniella Bayliss (Volunteer)*

Results of Visual Assessment

Originally Proposed MPA

Although the full, original location, biophysical assessment can be reviewed in Waters *et al.* 2018, a brief RVA of the site was undertaken in order to visually compare the original and newly proposed MPA site in President Quezon.

The area was described by a steep sloping reef, with a largely rocky area near the steepest drop-off. The northern section of the area was mostly comprised of sand and silt substrate with much nutrient indicator algae present. Some small and few large coral patches and rocks were noted throughout. As the team moved south, however, a more biodiverse landscape was observed. Soft coral, hard corals such as branching, foliose, tabulate, massive, and encrusting forms were noted in addition to anemones and lower cover of nutrient indicator algae. In this section, nearly 90% of the ground cover was dominated by hard coral.

Accordingly, with the substrates, more target fish species were seen in the southern part of the area than the north. These included large schools of Fusilier, Surgeonfish, Angelfish, Wrasse and Spinecheek, although very few commercially important fish species (Parrotfish, Snapper, Grouper) were seen. Furthermore, invertebrate abundance and diversity was observably higher in the south. These included the commercially important Giant Clam, Blue Seastar (*Linkia Laevigata*), Cushion Seastar (*Culcita novaguineae*), in addition to various nudibranchs and gastropods. The northern section of the area was mostly dominated by Long-spined Sea Urchins (*Diadem spp.*) and Feather Stars.



The varying topography of the originally proposed MPA area: North dominated by sand/silt on a steep slope, with some coral patches; moving south had reduced in the slope gradient, with smaller coral patches interspersed over the sandy substrate; Southern end was dominated by large coral patches, and diverse fish species.

-Photos by Jasmine Corbett (SO)

Newly Proposed MPA

Overall observations described a patchy reef, dominated by sandy and silty substrates. This was especially true in the northern section of the area, which consisted of nearly 50% sand cover. The survey team haphazardly encountered coral patches with tabulate coral colonies, encrusting sponges, tunicates, hydroids and soft corals. Most areas of coral cover were small (1m x 1m) with little fish diversity nearby, although some large patches (4m x 1m) were seen. Patches were characterized by an even distribution of hard (tabulate, massive forms) and soft corals, in addition to sponges. When considering the depth gradient, the newly proposed area had a steep-sloping reef, with more coral cover observed at depth (12m), while shallower areas had little coral cover. Numerous newly recruited coral colonies were noted, typically small encrusting corals. Due to the fragmented nature of the reef in comparison to the originally proposed area, which was segregated into two distinct areas of Sand and Hard Coral, an overall higher coral cover was estimated in the newly proposed area.

The presence of target fish species, including corallivorous and a limited number of commercially important species, was also noted. These included small (10-20cm length) Parrotfish, in addition to a few larger individual snappers (30-40cm length). A high number of Eastern Triangle Butterflyfish, in addition to sightings Redfin and Vagabond Butterflyfish were noted.

A small number of target invertebrate species were recorded, including the commercially important Giant Clam, and a Cowrie. A number of species of Nudibranchs were also encountered on site.

Anthropogenic impacts were high in the area, with numerous pieces of discarded fishing line and other fishing trash observed. A few pieces of other trash pieces were also seen on site.



Coral patch on a sloping gradient in the newly proposed area.



Lionfish hiding within the gaps of a coral patch.



Spider Conch on the silty substrate.

-Photos by Daniella Bayliss (Volunteer)

Recommendation

Due to the low number of large commercial fish, in addition to the high count of fishing trash noted on site, the new President Quezon MPA site exhibits signs of overfishing. There appeared to be a low level of structural complexity, especially at the shallow reef depth, which was dominated by sand and silt bottom. A high grading of structural complexity is ideal in supporting a large diversity of reef fish and invertebrate species.

The main substrates in both visually observed sites were sand and silt. Although more coral patches were observed in the newly proposed site, a well-established coral system, apparently supporting a larger diversity and abundance of fish, was seen in the originally proposed MPA area. However, the prevalence of silt within both sites is of concern. Siltation is often a problem, and is enhanced during heavy rainfall. Suspended sediments in the water can inhibit the ability for sunlight to penetrate through to the coral tissue, restricting coral growth. Furthermore, there is concern towards the future settlement and development potential of hard coral cover within the proposed areas. Even with a good supply of coral larvae, it is impossible to settle in these environments. Nonetheless, the observation of more rock substrate within the originally proposed area may be able to compensate for this settlement potential that has otherwise been lost due to the presence of silty substrate. In accordance with results from the biophysical assessment (Waters *et al.* 2018), protection including the southern section of the originally proposed area would be of first priority.

Note that although these inferences can be made, further scientific protocols (Underwater Visual Census) would be required for visual results of the newly proposed area to be conclusive. Regardless

of the selected area in which to establish an MPA, the location would assist in creating a connective network between other established MPAs within Sogod Bay, such as those in Barangays Bahay and Catig. This would allow the protection of species with large dispersal and geographic ranges, such as commercially important Groupers who leave their feeding grounds to access their spawning location, possibly existing outside of MPA boundaries and hence exposing themselves to exploitation.

The success of a protected area is entirely dependent upon the cooperation of, and engagement with, local stakeholders. Research has shown that the involvement of resource users in the planning, implementation and management of their own MPA increases their sense of ownership and pride. Only when local stakeholders feel they are adequately considered and regularly consulted on their MPA's management, will it be possible for the full potential of the MPA to be attained (Green *et al.*, 2009, Human and Davies 2010). By establishing clear, community driven objectives and goals during the formation of the President Quezon MPA, CCC hopes to address the key challenge to successful MPAs by ensuring that the MPA's by-laws, policies and restrictions fit into the greater ecological, social and economic context, contextualising not only the needs for the fauna and flora present within its boundaries but the needs of the local stakeholders and that of the municipality under the Republic Act No. 8550.

The newly proposed area surveyed under the RVA methodology highlighted areas that are potentially in a difficult position to support a healthy ecosystem. However, due to the methodology utilised, these preliminary data cannot be relied upon to provide scientifically sound marine spatial planning recommendations, but do formulate a basis for further assessment. As such, CCC recommends that a complete Biophysical assessment be undertaken

within the newly recommended area discussed in this summary report, situated north of the previously recommended protected area. Until a spatial ecological assessment can be undertaken, CCC cannot recommend an MPA at this stage but will establish meetings with Barangay President Quezon's captain to discuss opportunities for returning and assessing the area in higher resolution.



A coral patch in the originally proposed MPA area.

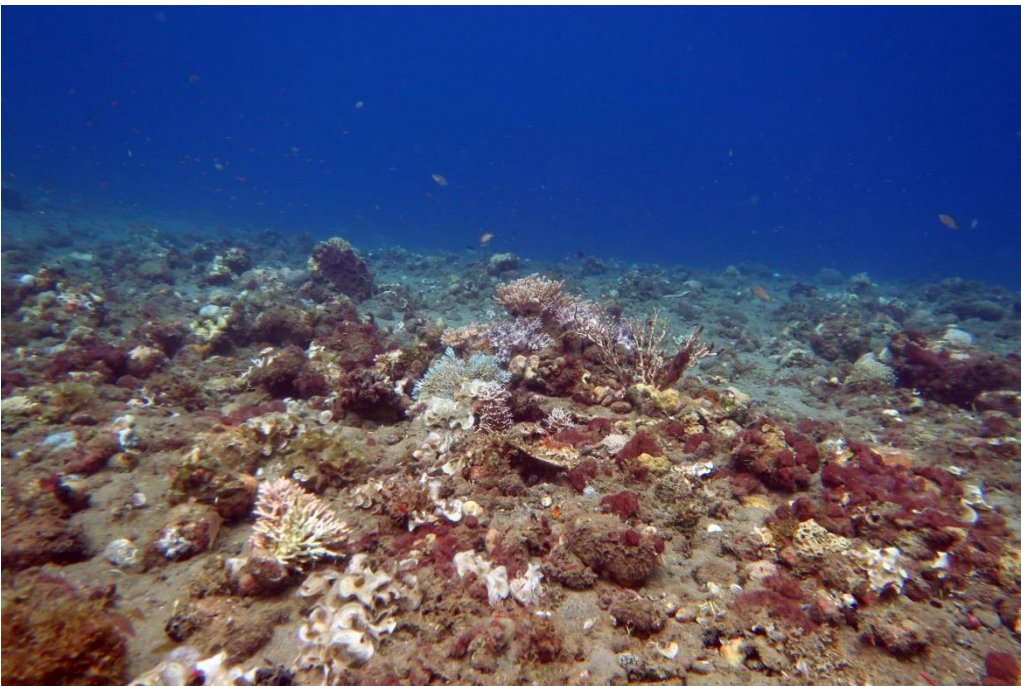
-Photo by Daniella Bayliss (Volunteer)

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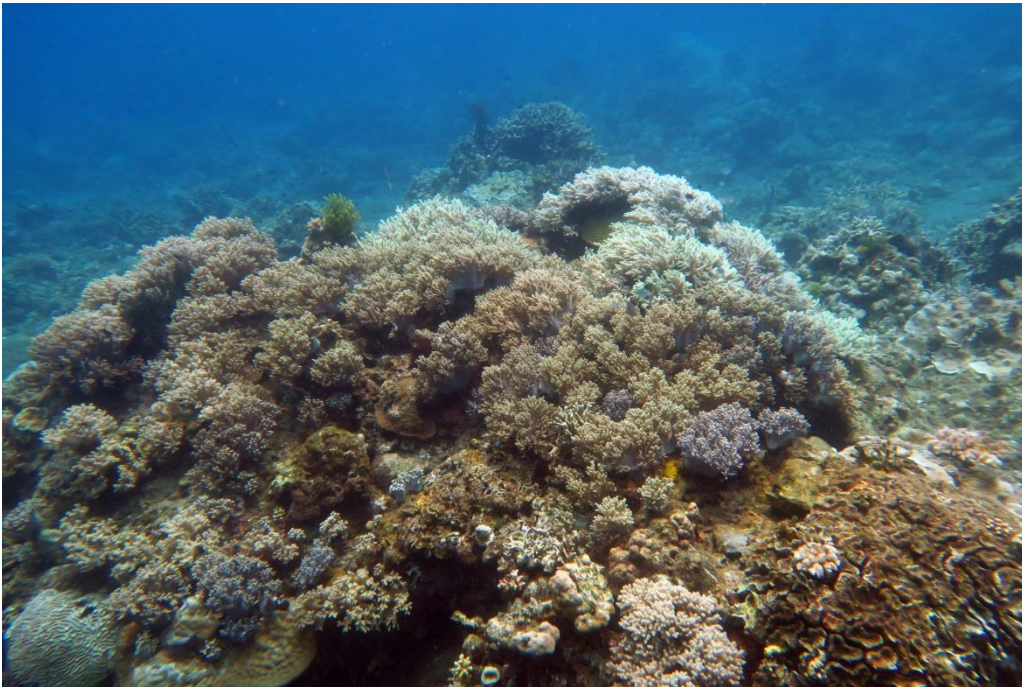
Appendices

Originally proposed area



A steep, sand-dominated slope in the northern section of the originally proposed area, becoming less steep with more coral cover towards the south.

-Photos by Jasmine Corbett (SO)

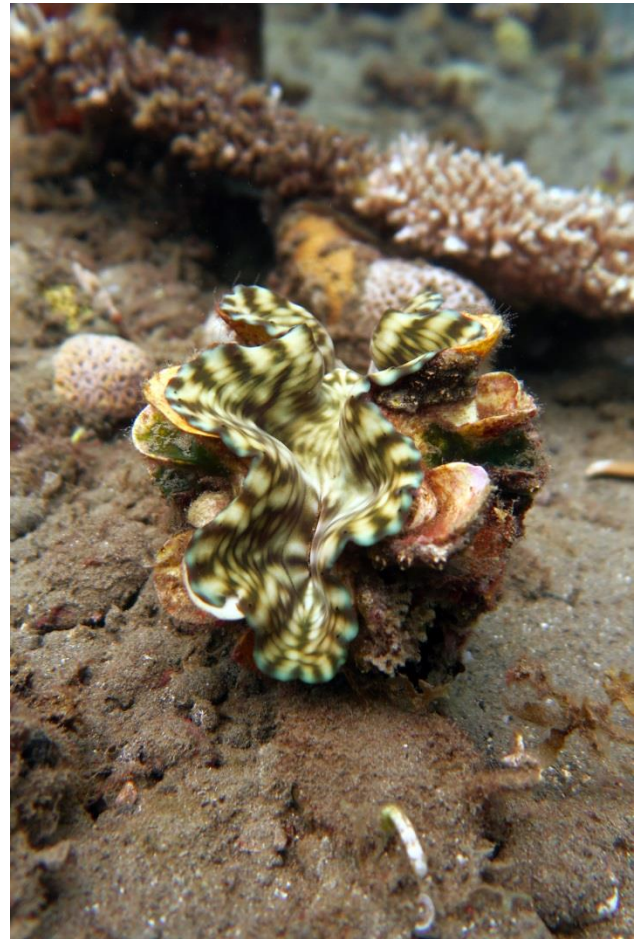


Large, diverse coral patches (with schooling fusilier in top photo), at the southern end of the originally proposed MPA area.

-Photos by Jasmine Corbett (SO)



A branching coral recruit seems to be establishing on a sandy substrate. However, even with a good supply of coral larvae, it is impossible to settle in these environments. Nevertheless, the high recording of rock substrate within the area may be able to compensate for this settlement potential that has otherwise been lost due to the presence of sandy substrate



A medium-sized Giant Clam. This species is commercially important and in some sites around Sogod bay has been shown to have its populations depleted due to overfishing. The establishment of an MPA in President QUEZON would allow this species, in addition to others, grow to maturity and reproduce in the area; providing a sustainable supply for fishermen.

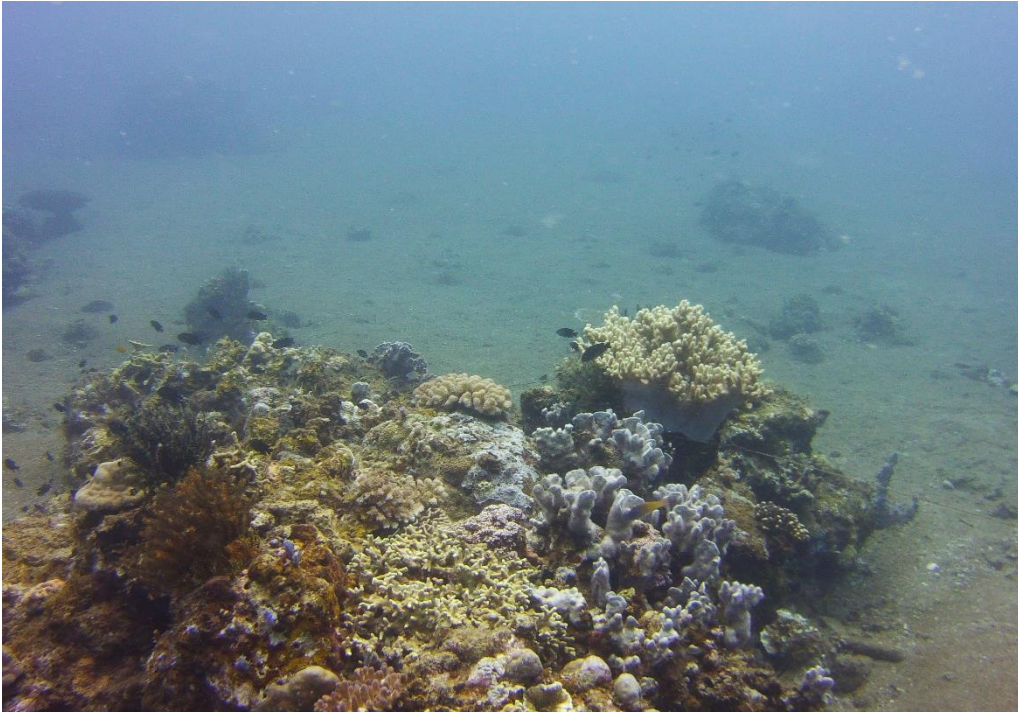
-Photos by Jasmine Corbett (SO)

Newly proposed area



The dominating substrates in the area were sand and silt, somewhat evenly dispersed with patches of coral.

-Photos by Daniella Bayliss (Volunteer)



A mixture of rocky and coral patches were also intermittently encountered throughout the area.

--Photos by Daniella Bayliss (Volunteer)



Some coral patches hosted more biodiverse communities, such as anemone and other fishes (top) and sponges and nudibranchs (bottom)
-Photos by Daniella Bayliss (Volunteer)