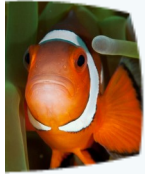
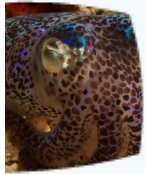




- CCC CARRIED OUT AN ASSESSMENT OF THE REEFS IN COASTAL WATERS OF SAN BERNARDO FROM APRIL TO JUNE 2017



- HARD CORAL WAS THE DOMINATE SUBSTRATE IN THE SURVEYED AREA FOLLOWED BY ROCK WHICH HAS THE POTENTIAL FOR NEW CORAL RECRUITS, WHICH WOULD IN TURN SUPPORT COMMERCIALY IMPORTANT REEF FISHES AND INVERTEBRATES IF PROTECTED



- ELECTRONIC AND HARD COPIES OF THE FULL TECHNICAL REPORT ARE AVAILABLE FROM OUR PROJECT SCIENTIST: LRCP@CORALCAY.ORG

CREATED BY STUART ROSS AND JORDON WILLIAMS -SCIENCE OFFICERS

CORAL CAY
CONSERVATION



Barangay San Bernardo Proposed MPA

San Bernardo is dominated by hard corals and rock substrate, making it a complex and diverse reef system that can continue to grow if given the opportunity. Targeted fish and invertebrate species abundance were high with only commercial species being in low abundance which prompts protection status.

The Current Status of the San Bernardo Reef

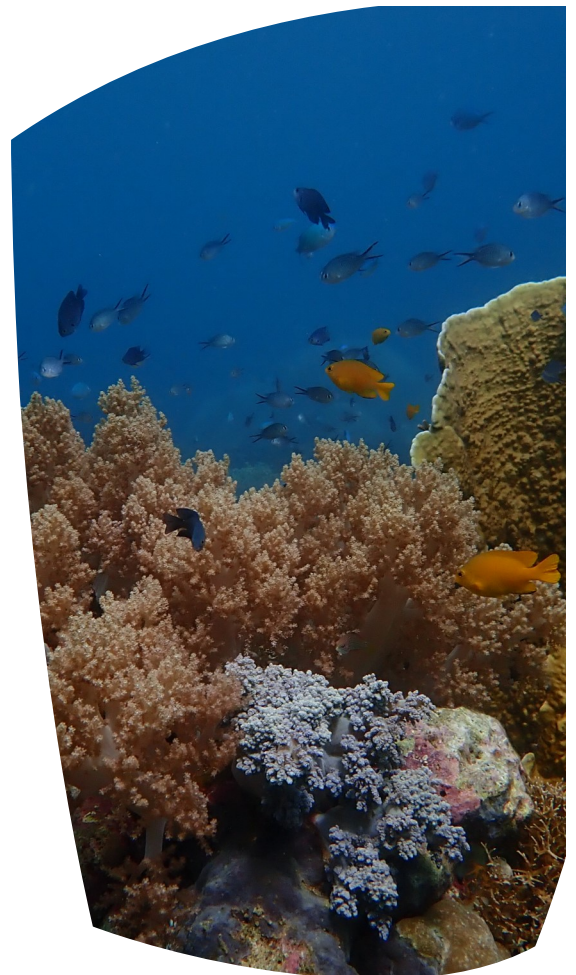
Following CCC surveys, it was found that the dominant substrate of the San Bernardo reef was hard coral (32%) followed by rock (30%) and then sand (15%). While bleaching and coral disease was recorded as low within the survey, predation from *Acanthaster planci* (Crown of thorns sea stars) (12 counts) and *Drupella* sea snails (131 counts) were accounted for the majority of the coral damage recorded.

The average total target fish abundance per transect was fairly high, at 102.12 ± 10.77 per 500m^3 . However the low abundance (7.75 ± 1.07) and small size ($<30\text{cm}$) of commercially important fishes indicates a highly overfished

area, in need of protection. Of the commercially important fishes such as Grouper, Snapper and Parrotfish, herbivorous fish (Parrotfish) displayed the greatest abundance (266) and biomass (17.35 kg) throughout the surveyed area.

Invertebrate populations displayed a moderate mean abundance of 101.48 ± 11.77 per 100m^2 which combined with species richness suggests a diverse population. However, commercially important species abundance was low.

Overall the direct anthropogenic impacts were low. General trash was recorded as the greatest impact



Why Are MPAs Important?

Marine Protected Areas (MPAs) protect areas of reef from human impacts. Within an MPA, fish are protected and can grow larger, producing more offspring. This leads to 'overspill', increasing fish numbers outside the MPA. In the Philippines many very successful MPAs have been created including the famous Apo Island MPA. Not only do these well managed MPAs help to enhance fish stocks, they also provide income from tourism and other benefits such as protection of coastal habitats and communities from storms.

CCC's assessment of San Bernardo's Coral Reef

Results indicate a stable and diverse abundance of coral-reliant fish species, but a lack of commercially important fish and invertebrates suggests that the reef has been affected by "top-down" impacts. But the reef has the capacity to improve with protection.

With hard coral being recorded as the most prevalent substrate, this indicates that regardless of seasonal exposure to strong currents, coral larvae can still settle and grow into mature colonies producing high hard coral cover. The presence of all three life traits also indicates that the reef ecosystem is capable of supporting a diverse community assemblage.

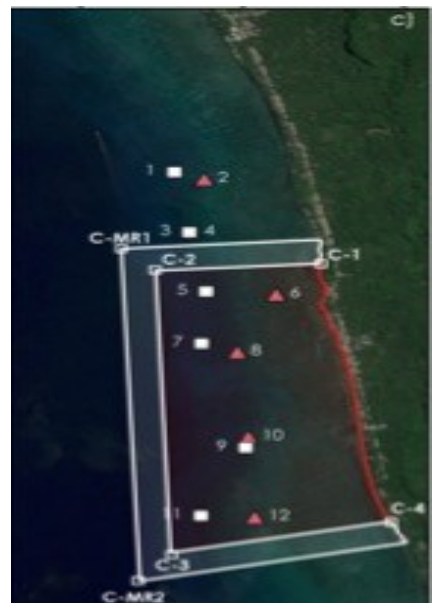
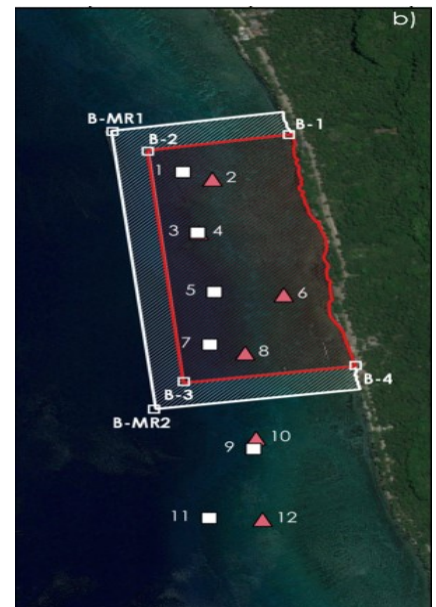
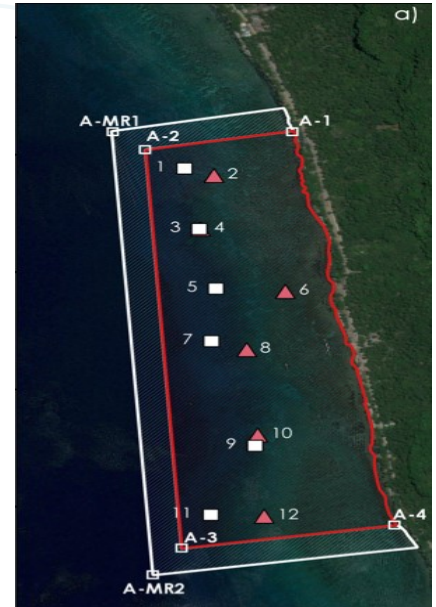
However, the low number of commercially important fish indicate that this site is currently an active fishing site, this is supported by the presence of fishing trash recorded on site.

If assigned MPA status and top down stressors such as fishing can be removed and help recovery. The ideal MPA size would be option A, covering 31.96 ha and allow the most promising chances for successful reef improvement. Option B is the smallest at 17.74 ha but still includes areas of high hard

coral cover, high invertebrate abundance and high fish abundance including butterfly and commercial species. The third option, C, covers 23.77 ha and includes areas of high abundance for hard coral, fish and invertebrates. But it also includes areas in the South with the lowest abundance of fish and invertebrates.

Key Recommendations:

- The marked Marine Protected Area boundary should include a NTA (no take area), surrounded by a 50m Marine Reserve buffer with restricted fishing activity.
- High MPA enforcement will be necessary to prevent illegal fishing or poaching within the site.
- Fishermen should be involved in the establishing and monitoring process in order to ensure continual success of the MPA.
- Coastal management regimes should be introduced to control anthropogenic induced reef damage.



Coral Cay Conservation

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Expeditions

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