

Study On Reef ball At Batu Penyu nearby Talang Talang Island

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Abstract.

This papers presents data collected by Fisheries Research Institute Sarawak Branch on the status of reef balls in the Kuching region of southern Sarawak in April 2003. The primary aim of the project, and main role of Fisheries Research Institute Sarawak Branch, was to assess the status of reef balls habitats currently present at Batu Penyu nearby Talang Talang Island. An underwater surveying programme was initiated in April 2003 using divers, mainly from the Fisheries Research Institute Sarawak Branch and Department of Marine Fisheries Sarawak. Belt transects surveys conducted on the reef ball at Batu Penyu nearby the Talang Talang Island. The Line Intercept Transect Method was used to assess the composition of benthic organisms at reef balls. This was a first scientific survey conducted within this area. Around 5 benthic were identified during the survey. Most of the reef balls show new coral growth. Objective of this study is to determine the percentage of coral reef attached with the reef ball.

Keyword: coral, reef ball, Sarawak

Introduction

A Reef Ball is a Designed Artificial Reef used to restore ailing coral reefs and to create new fishing and scuba diving sites. Reef Balls are used for beach protection, freshwater, mitigation, and many other uses too. Reef Balls are the only artificial reefs that can be floated and towed behind any size boat! Reef Balls are made of a special, marine friendly, concrete and are designed to mimic natural reef systems. They are used around the world to create habitats for fish and other marine and freshwater species. Over 500,000 Reef Balls have been deployed in over 3,400 projects worldwide (<http://www.reefball.org>). Sarawak is the first place in Asia to use environmentally friendly - "Reef Balls" to conserve its marine life - marine turtles in particular. Since 1998 about one thousand reef balls have been deployed around the coast of Sarawak. The characteristics of reef balls are constructed using cement of the same pH as salt water with use of special admixtures and micro silica. This ensures that the reef balls mimic natural reef limestone and remain stable. They contain no toxins (e.g., heavy metals, petroleum, PCBs) that leach into seawater, neither do they contain any biologically active compounds (e.g., iron, copper, fertilizers, vitamins). They remain stable on the sea bottom, even during cyclones. They are predicted to last at least 500 years. They have a variety of surface textures to enhance the settlement of marine life. They have holes that not only go into the reef ball but between it walls. A large open area in the center is designed to provide shelter for fish, and the holes create vortices, which feed the

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invertebrates and corals. They have sharp textured surfaces, which are capable of ripping trawler nets. When the reef balls are placed in small clusters, they provide a physical barrier on which trawler nets will become entangled.

Talang Talang coastal waters are characterized by high diversity of species. However there was no scientific study conducted within this area especially which related on reef ball. Our objective is to determine the percentage of coral reef.

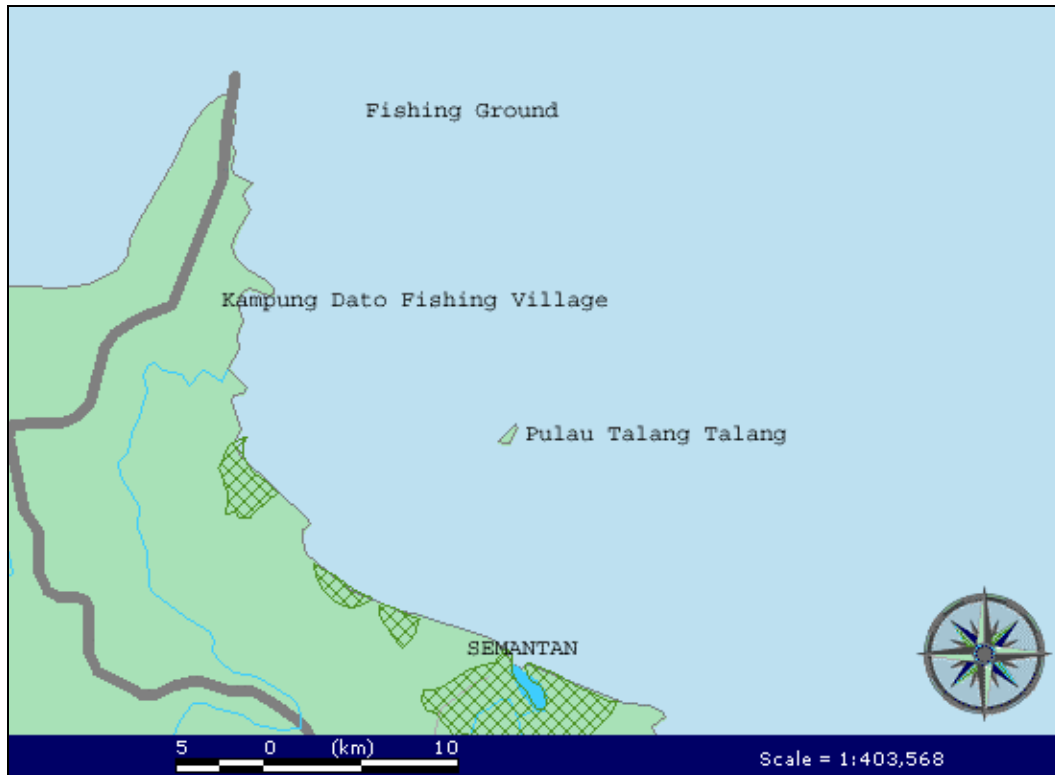


Figure 1. Map showing the location of Pulau Talang Talang

Material and Method

Earlier year 2000, several reef ball made by concrete, were deployed at about 9 m deep, 5 miles off Talang Talang Island, on a flat sandy bottom north coast of Sematan which located as table below (figure 1). The area occupies approximately 1500 m square. All the station are stated as below:

Station	Latitude & Longitude
1	1° 52.624N & 109°45.582 E
2	1° 52.62 N & 109° 45.578 E
3	1° 52.615 N & 109° 45.578 E
4	1° 52.607 N & 109° 45.576 E
5	1° 52.614 N & 109° 45.584 E

Table 1. Location of Reef ball nearby Talang Talang Island

The Line Intercept Transect (LIT) method (English et al, 1994) was used to assess the sessile benthic community of the reefs. The community is characterized using life form categories, which provide a morphological description of the reef community. The LIT is used to estimate the cover of a life form or group of life forms within a specified area. Gates, 1979 reported by calculating the fraction of the length of the line that is intercepted by that life form. Two general assumptions are made; the size of the life form is small relative to the length of the line; and the length of the line is small relative to the reef of interest (English et al, 1994). The measure of cover, expressed as a percentage, is then considered to be an unbiased estimate of the proportion of the total area covered by that life form.

At each site surveyed, 100 meter transect line were laid at a depth of 8 m using measuring tape (figure 2). Once the transect laid, the observer moved slowly along the transect, recording on data sheets the life forms encountered under the tape. At each point where the benthic life form changed, the transition point in centimeters and the code of the life form was recorded. The intercept of each life form encountered under the transect is the difference between the transitions points recorded for each life form. To ensure standardization of the data, the same observer recorded data for each individual transect, at all sites and during repeat surveys. For data analysis, all data was entered into a MS Access database. This database was extracted and analyzed using MS Excel.

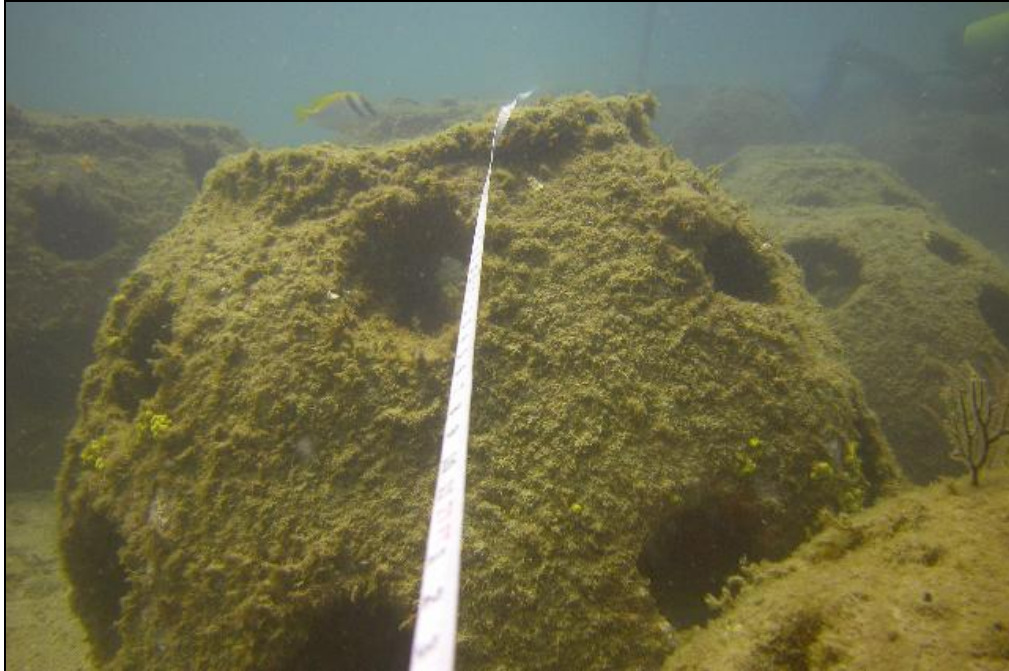


Figure 2. 100 meter transect line were laid along the reef ball at the depth of 8m

Result

A total of 5 benthic categories were found from the study area (Table 2). Results are presented as means with standard deviation. However, in categories for Reef Fishes and Invertebrate were not recorded due to the lack of expertise/manpower. Mean percentage cover values for benthic categories are presented in Figure 3. During the study, sand appeared to be most dominant, 53%. Meanwhile, Rock with Algae was the second highest with the percentage 25%. Others (e.g. sea cucumber, star fish etc.) contribute 17%. This is due to location of the reef ball. Distance between each reef balls was 10 meters. Therefore the sediment that occupied this distance was sand. Data presented in this report can be obtained from the Fisheries Research Institute Sarawak Branch base upon request (friswak@po.jaring.my).

Station 1 to 5	
Sand	53.64 %
Others	17.48 %
Rock with Algae	25.29 %
Coral Encrusting	0.24 %
Sponges	3.35 %
TOTAL	100 %

Table 2. Benthic categories found at Batu Penyu

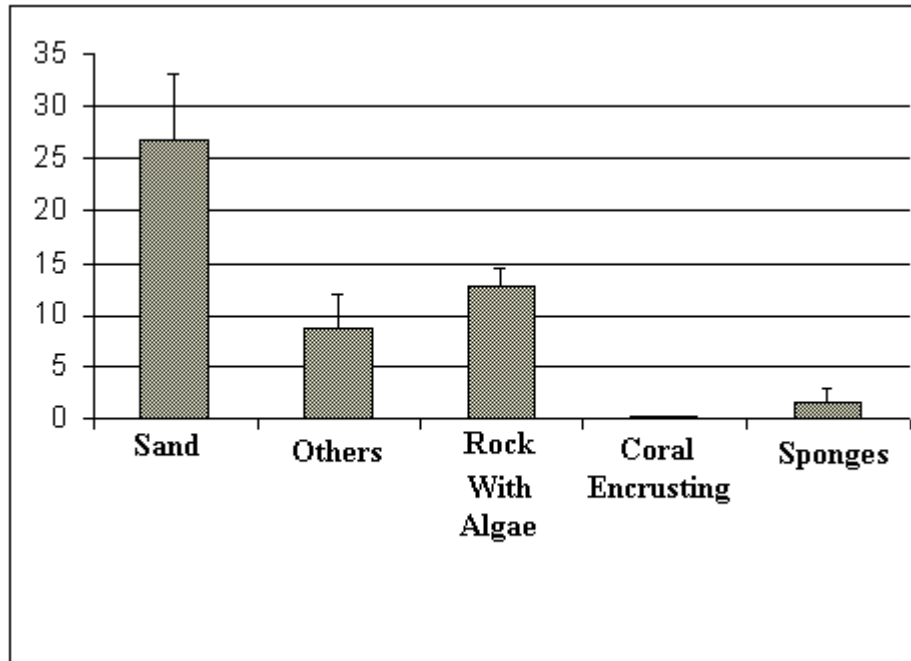


Figure 3. Mean percentage cover values for benthic categories

Discussion and Conclusion

Reef balls appeared to be successful as a basis for the growth of new coral reefs. It was found that reef balls are colonised by a range of marine animals and the colonisation rate is very encouraging (Christopher, 2001). The coral contribute 0.24 %, meanwhile sponges gives 3.35 % for the coral growth at reef ball. Fishes were normally seen feeding within the reef, mostly when the waters were less turbid. After more than 2 years, most of the reefballs are covered by algae and invertebrate, thereby providing food for several fish species. This will enhance the fish populations within this area. Pilcher, N and Cabanban, A (2000) reported no quantitative data is available on coral cover especially in Sarawak, but hard corals comprised mostly *Porites* (CM and CD), *Echinopora* (CF and CE), *Diploastrea* (CM) and *Montastrea* (CM and CE).

Reef balls are also efficient to avoid any trawling activities, and are especially useful near turtle nesting beaches (Ismaili, 2003). More reef balls could be deployed to build reefs for recreational SCUBA diving, as they are used by attractive reef fish. Reef balls appear to be successful as a basis for the growth of new coral reefs.

A further study should be conducted especially fish composition and fauna inventory within this island. With this information, a good conclusion can be made. Long-term and short-term monitoring should be conducted to see the impact and growth of coral reefs in Talang Talang Island.

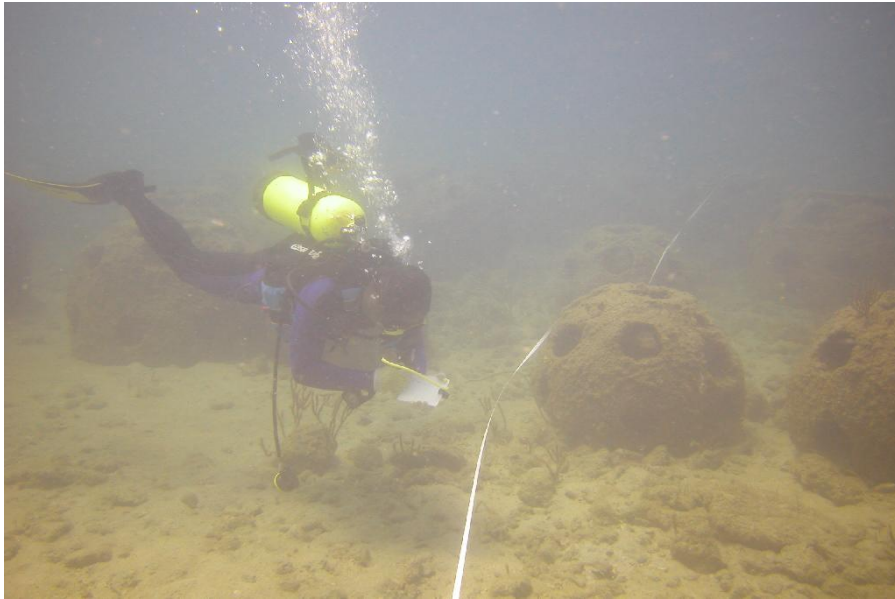
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References

- Christopher, K.U. 2001. Colonisation and growth of marine animals on artificial reefs at Batu Penyu, Talang-Satang National Park, Malaysia. *Hornbill* 5:nn-nn
- English, S., C. Wilkinson and V. Baker. 1994. Survey manual for tropical marine resources. ASEAN-Australia Marine Science Project. Australian Institute of Marine Science, Townsville.
- Ismaili, B. P. 2003. Unpublished Reef Ball data and personal communications.
- Pilcher, N and Cabanban, A. 2000. The Status Of Coral Reefs In Sabah, Labuan And Sarawak, East Malaysia. GCRMN. Australian Institute of Marine Science. 57pp.
- Zalmon, I. R., Novelli, R., Gomes, M. P., and Faria, V. V. 2002. Experimental results of an artificial reef programme on the Brazilian coast north of Rio de Janeiro. – *ICES Journal of Marine Science*, 59: S83–S87.

Appendix



The diver moved gradually along the transect and record the life forms which come across under the tape



Location of Reef Balls at Batu Penyu



Angelfish (*Pomacanthus imperator*) as indicator fish species at reef ball area



A group of Angelfish Round Batfish (*Platax teira*) were commonly seen feeding on and around the reef balls, particularly when the waters were less turbid.



Algae and soft coral mostly covered surface of the reef balls



A friendly squid (*Sepia sp.*) swim at the bottom of the reef balls, depth 8.5 meters, 1200 afternoon