

Stack of Reefballs in Lagoon's Pulau Layang Layang

You might call the Reef Ball an underwater condo for fish, especially grouper and snapper. After the Reef Ball is in the water awhile, marine organisms begin to grow, small fish move in and then larger fish.

Bill Lindberg, associate professor at the University of Florida's Department of Fisheries, says an artificial reef can boost fish population by about 8 percent.

If a reef site is over-fished, it can result in a decrease fish population. Reef Balls have holes that not only go into the module but between the walls. The large open area in the center is designed to provide fish shelter. The holes are designed to create vortexes which feed the invertebrates and corals. Many other artificial reefs assume that surface area or profile alone

will support fish. Profile only attracts (but does not support) certain types of fish. Raw surface area without the right composition is just dead space (surface area needs current, light or both to be productive)

The stacking the reefballs in Pulau Layang Layang lagoon was carried out by 7 divers. The divers team came from various place, Fisheries Research Institute (FRI) Penang, Fisheries Institute Sarawak and Department of Marine Fisheries Sarawak

This project was carried out from 31st May until 13th June 2006. This was a first monitoring since the deployment of reefballs had been made, April 2005. There are 300 units of reefballs located in the lagoon of Pulau Layang Layang. Station A with the total of 200 units and Station B, 100 units



Lifting bag was used during the process of stacking the reefballs. The balloon or lift bag can carry up to 1000kg or one tones. Therefore two lift bags required to pull

Roving Diver Technique was carried out by a diver around the reefball

up a reefball. It is a necessity of having special skills to carry out this work.

View from surface before reefball's stack



Liftbag was used to pull up the reefball



After organized or stacking the reefball



“Underwater Oasis - Artificial Reefs Provide Refuge for Fish.” by Daud Awang, Malaysia

The coral propagation study was carried out by cutting the branching coral into small fragments with the size of 5 to 10cm, and then attached them on the reef-ball surface.

Coral fragments are often able to grow over the wires or cable-ties attaching them within months. At present there is limited information on which coral species are suitable or unsuitable for transplantation. Branching species such as those in the families Acroporidae and Pocilloporidae tend to be fast-growing and easy to fragment. As such they have

been much favoured in transplantation as they can produce a rapid increase in % live coral cover in a relatively short time.

Coral restoration should not be considered as a one-off event but an ongoing process which will benefit from adaptive management over a period of several years.

A rough global estimate of the average total annual value of coral reef goods and services is US\$6,075 per hectare or 10,000 meter square.



Asexual propagation of corals on reef-ball. The coral grow 2 to 5mm within 3 months.



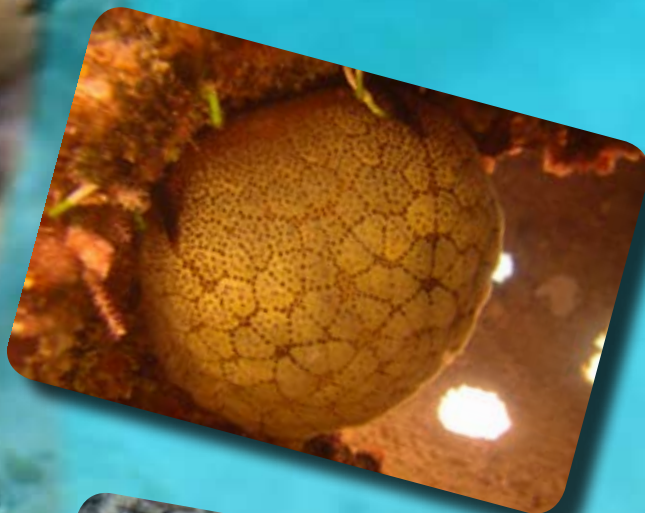
Colonization after 3 months. Soft corals, Nephtheidae distribute very well around reefballs



After 6 months. The larger fish occupied the reefballs.



Checklist of Marine Fauna and Flora in Reefballs



*Culcita
novaeguineae*



Pterois volitans



Acropora sp.

Atriolum robustum



Didemnum molle



Oxycorynia fascicularis



Choriaster granulatus

