

Reef Balls - a scientific approach to building artificial reefs.

by **MEL BODEN**

Cliff Lee-Jaillet remembers diving the reefs in Grand Case, St. Martin thirty years ago. They were lush, bustling with marine life. "Now the area is a marine desert," he says, devoid of the fish and coral that once brought beauty and livelihood to locals and tourists. St. Martin is not alone. Worldwide, 109 countries have reef systems. Of them, 93 are now extremely damaged.

Destruction of the rain forests has grabbed public attention in recent years, with good reason. Valuable natural resources are destroyed forever; the food chain is interrupted.

Though it's harder to see, under the ocean surface and humans living on the same destruction. Hurricanes are, of course, a major cause. Storms and on-shore construction drain silt into the once-clear waters. The sediment settles on coral, killing it by blocking light and food supplies. Since fish can

no longer feed on the coral, the underwater food chain is interrupted. Careless anchor placement by yachts, divers gathering living coral and over-fishing are all to blame.

Throughout the Caribbean, Cliff has seen juvenile tropical fish for sale in local markets. And he notes, "The fish deficit is getting smaller and smaller - nothing escapes."

Coral is a vital link in the sea's food chain. Lack of awareness and regulation on fishing, coral-taking and mooring on reefs disrupts the independent ecosystem and disrupts the food chain so fishermen must go further and further out to find fish.

Cliff is concerned about the underwater environment. He's been diving all his life, has degrees in Marine Science and Marine Biology and is currently working on a Masters in Oceanography. Since natural reefs take thousands of years to form, he has

turned his interest to creating artificial reefs.

Many methods are used to reproduce the coral environment. Often ships, cars or limestone boulders are sunk, creating a place for coral to take hold. But ships and cars move with the tide, breaking up coral life and releasing toxins. They biodegrade in 20 to 30 years. Limestone has few pockets for small micro-organisms to attach themselves. And all these methods are costly, requiring heavy equipment to deploy.

Seven years ago Todd Barber, an American businessman and avid diver, was also troubled by the damage to the world's reef systems. He discussed the issue with some diving buddies and they experimented with pouring concrete over a beach ball. "Because of the inflated center... we could float it into the ocean by small boat and have the tremendous expense involved with renting a crane and barge to transport the object."

Todd said, "Sinking the ball would be easy, just deflate the beach ball center." And so began an innovative company - Reef Ball Development - with a new approach to artificial reef formation.

The years of research and development spawned the A Reef Ball beach ball experiment. Five years ago, participants were found.

The beach balls are transformed to bottom-heavy concrete mounds with irregular Swiss cheese-like holes drilled over the surface. The holes create whirlpools within the ball, aiding in stability and simulating a natural habitat for marine life. Reef balls have maintained the same position after Category 3 hurricanes in less than 10 feet of water and their life expectancy is estimated at 500-plus years. The concrete is pH balanced to the ocean - in fact, fish move in as the balls are placed. Once the ball is in position, the rugged balloon inside is deflated slowly, making pinpoint landings possible. In essence, reef balls are a seed for a natural reef.

They are used worldwide for a variety of purposes - with custom additives affect soft or hard coral, angelfish, lobsters.

Disceyland used them to create underwater habitat to be viewed from glass-bottom boats. In Cancun, Mexico, 300 reef balls were put in 10 years ago. Compared to other artificial reefs of the same size over the same time period, the fish population doubled, and there was three to five times the diversity in types of fish. Special interest to holders in hurricane areas, reef balls have also been used to build a protective harbor mangrove planting.

Reef balls range in size from 8 pounds to 8000 pounds, measuring from inches to 3 1/2 feet in height. Costs range from \$125 to \$1000 US.

Cliff has become a champion for artificial reef cause, giving talks at school children about the state of the oceans. He now operates "Coral Towing" the Caribbean distributor of Reef Ball Development Group.

And he's hoping to appeal to the Caribbean tourist market - developing a Reef Ball program for resorts and hotels. He contemplates a two-day schedule - the first day will be educational. The second day, participants will place their own reef ball in the ocean. They will register the GPS coordinates under their own name. Cultural activities, as holding participants, as well as the resort's island economy. Year after year participants add the

reef life they've contributed. A islanders benefit by having reefs to with tourist dollars.

When asked how we can help, I stressed placing anchors with care - taking only loose, non-living corals. Then he described jacking. "When you're diving, take a moment to jar the reef, wash the sediment off coral. Some divers take off bits of the reef, but you can just do it with your hand. Don't actually touch the coral that's harmful. Now just wave your hand close to the coral, letting water wash over the surface. You'll smooch at how quickly the coral can look to life - you can watch the blood back. And the fish start feeding right away!" You can almost hear reef saying thank you.

Cliff can be contacted at EF 5 Grand Case, St. Martin Codex 7. Phone or fax (590) 29-2931, e-mail cbarber@outriggers.com or visit pages including a video on the Internet at <http://reefball.org/>



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