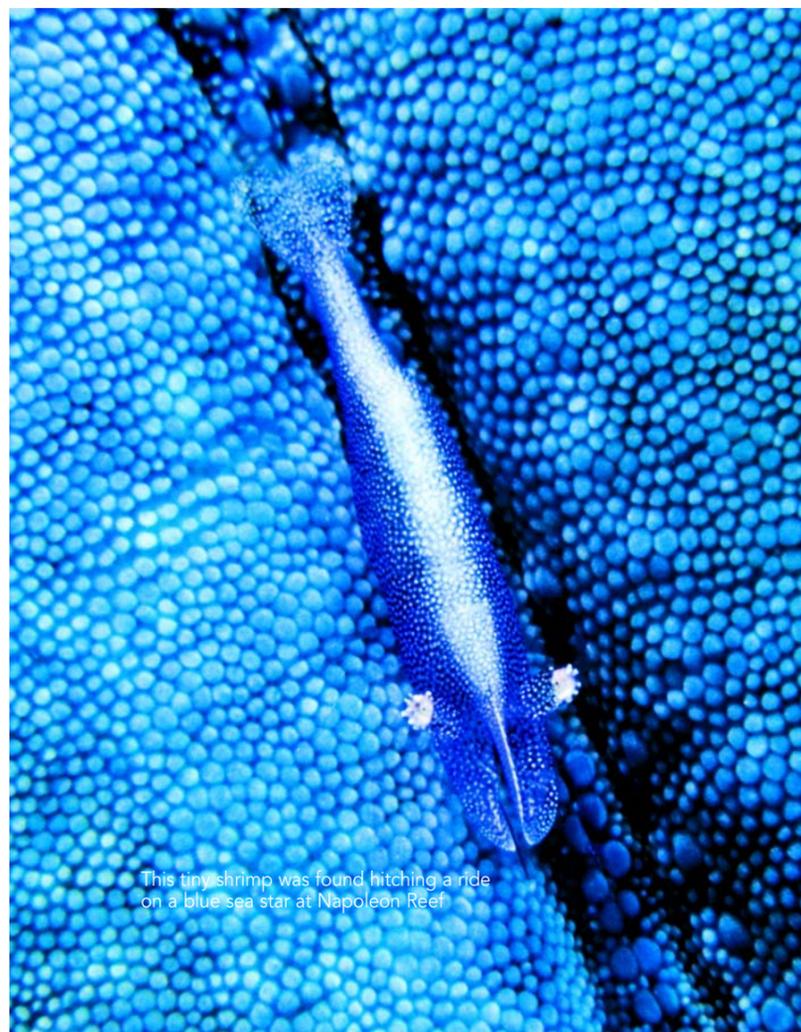


THE REEF OF PEMUTERAN

: JEFF MULLINS

+ OUR LAST VISIT TO DIVE PEMUTERAN BAY ON BALI'S NORTHWEST WAS IN LATE 1998, JUST AFTER THE CORAL REEFS OF THIS REMOTE FISHING VILLAGE HAD BEEN ALMOST DECIMATED BY TWIN DISASTERS - THE DOUBLE EDGED SWORD OF WIDESPREAD CORAL BLEACHING FOLLOWED BY AN INVASION OF CROWN OF THORNS SEA STARS AND DRUPELLA SNAILS, ANIMALS THAT DEVOUR THE LIVING POLYPS OF CORALS.



This tiny shrimp was found hitching a ride on a blue sea star at Napoleon Reef

Then, on each descent, we were greeted by devastation. White skeletons of dead or dying corals and almost everywhere we looked, crown of thorns were eating the few surviving corals. The reefs were all but deserted; most fish had moved out of their coral homes. We thought the reefs of Pemuteran were dying right before our eyes.

Fast forward 10 years to 2007. We're visiting Pemuteran again for a dive trip. What would we find – decimated reefs or signs of recovery? We were really surprised – the story that unfolded during our recent visit was a legacy to the human spirit, a shining example of what can be achieved by the active participation of local community members in ecology and conservation projects. We discovered the Reef Gardeners of Pemuteran Bay.

Pemuteran is in a dry arid part of Bali in the rainshadow of the island's central mountain chain, but due to little fresh water runoff, coral reefs thrive around the coastline. Once just a small quiet fishing village, its potential as a base for visiting divers to explore the offshore reefs was recognised and in 1992 Pemuteran's first dive centre opened, plus a couple of small accommodations. Since then these accommodations have expanded, plus a few more mini-resorts have opened, along with their own dive centres.

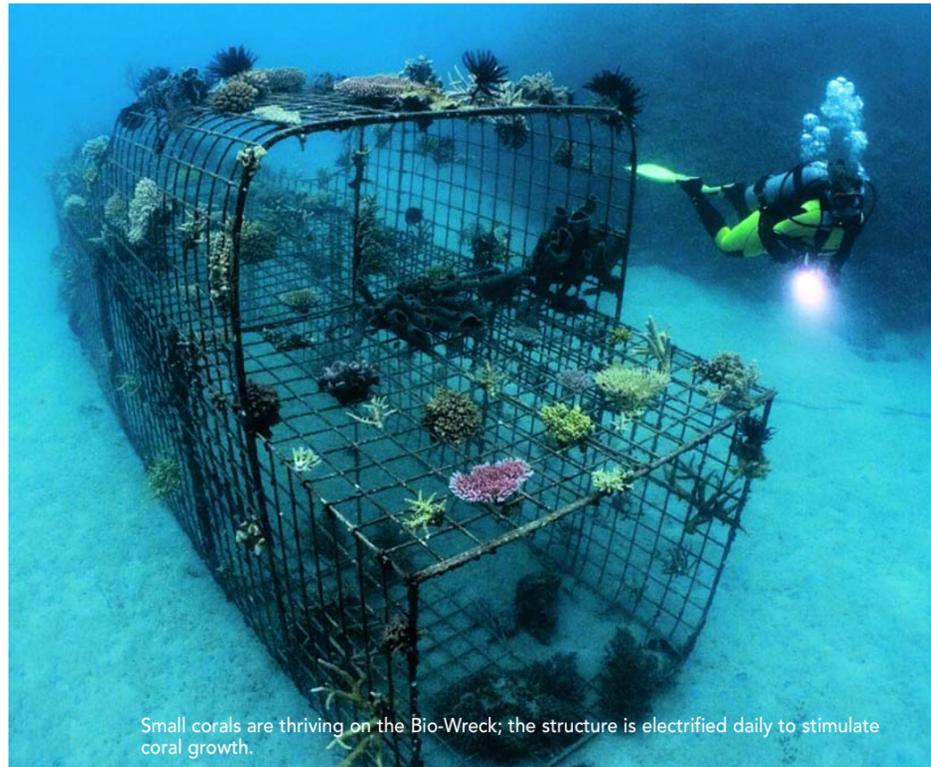
GARDENERS



The Reef Gardeners conduct regular reef monitoring dives, collecting both Crown of Thorns and Drupella snails



// a legacy to the human spirit... //



Small corals are thriving on the Bio-Wreck; the structure is electrified daily to stimulate coral growth.



The reefs of Pemuteran are recovering very well – many areas show greater diversity of corals than prior to the bleaching of 1998.

In 1999 the local community recognised the importance of the area's marine attractions and declared the inshore waters of Pemuteran Bay a Marine Protected Area (MPA); in 2005 the area was extended to cover an offshore reef known as Tukad Jarang. Brainchild of expat Australian Chris Brown, also a long-time resident of Pemuteran, the Reef Gardeners are a small group of local Balinese who were first trained as scuba divers and then introduced to the conservation methods required to help save the damaged reefs.

Funding for the Reef Gardeners has come from a combination of the AUSAID program, public donations, and from funds raised by the Reef Gardeners themselves by taking visitors out on snorkeling trips to see the coral reefs. One of the primary roles of the Reef Gardeners is to remove crown of thorns and the coral-consuming drupella snails from the reefs. Without these predators, corals often naturally recover rapidly from the effects of bleaching. To date the Reef Gardeners have removed over 5,000 crown of thorns and 53,000 drupella snails from Pemuteran Bay. They've also scuttled six 'wrecks' close to one of the offshore reefs, plus constructed and sunk a bio-wreck – a boat-shaped steel structure – at the same site. They've also constructed Bali's first underwater Hindu temple, complete with stone statues 30 metres below the surface.

Our first dive back at Pemuteran was at Kuburan Kapal (Ships Graveyard), where we explored some of the Reef Gardeners sunken wrecks. These are mostly old fishing boats scuttled on a sand bottom close to the edge of Tukad Jarang reef. Among these is a Madurese fishing prahu that was then introduced to the conservation methods required to help save the damaged reefs.

Each day the Reef Gardeners take their boat *Reef Re-Gen* out to the Ships Graveyard and connect an on-board low voltage generator, via buoyed cables, to the Madurese fishing prahu and the Bio-Wreck. This electrical current stimulation is known as Bio-Reef and has been used along the inshore reefs of Pemuteran for over 10 years and is recognised as one of



Above:
The Temple Garden statues are already coated with sponges and crinoids, the surrounding reef is also very rich.
An orangutan crab
The deeper reefs at the Ships' Graveyard have beautiful sponges and corals
The Reef Re-Gen has a low voltage generator onboard that when connected stimulates coral growth

conservation°

the most successful reef restoration projects in the World.

Just after the Bio-Wreck was submerged the Reef Gardeners tied small pieces of live corals all around its structure. These were collected from patches of reef damaged by boat anchors in the area, which are now thriving with plenty of healthy new growth in vibrant colours. Now many smaller reef fish have taken up residence here after less than a year on the bottom. The Reef Gardeners' daily patrols out to the reefs ensures that fishermen from outside Pemuteran are reminded this area is now closed to dynamite fishing and aquarium collecting, destructive practices previously carried out here.

We were invited by the Reef Gardeners to join them on a reef monitoring dive. A 15 minute boat journey had us tied to a mooring at Napoleon Reef a few kilometres offshore. We descended armed with a metal hook, collecting bag and Kadek our Reef Gardener guide. We slowly finned along the reef following Kadek as he searched the reef for crown of thorn sea stars and drupella snails. We meandered among healthy patches of elegant staghorn and large table corals; this reef had recovered well, with very few signs of damage at all. But not too far into the dive Kadek was gesturing for us to look below a small coral ledge. We could just see one spiky arm of a crown of thorns, well hidden in the dark recesses. Kadek carefully hooked the feeding sea star from its coral breakfast and slipped it into his collecting bag, moving along the reef in search of more predators. On this dive alone, he collected eight crown of thorns and around 30 drupella snails, all of which we wouldn't normally have seen as they are camouflaged so well among the corals.

To us the jewel in the Reef Gardeners crown of achievements has been the construction of an underwater Balinese Temple at a dive site known as Taman Pura (Temple Garden). The reef lies along the western shore of Pemuteran Bay, overlooked by three traditional Balinese hillside temples. There's beautiful shallows close to shore that make excellent snorkeling, but just a little further out the reef drops dramatically over a sheer wall to 28 metres. It's here that the Reef Gardeners have erected a dozen or more large Balinese stone statues on plinths, plus a Candi Bentar gateway – the traditional entrance gate to a Balinese Temple.

TRAVEL TRICKS

Getting There: Pemuteran is a 4 hour drive from the resort areas in the south of Bali.
Where to Stay: There are various accommodations in Pemuteran. Among the best of these that also have dive centres are:
Reef Seen Aquatics - dive@reefseenbali.com
Taman Sari Bali Cottages - tamanri@indosat.net.id
Pondok Sari & Matahari Beach Resort - bali@wernerlau.com

marine conservation°

Our first glimpse of Bali's underwater temple was in near-perfect calm and clear conditions. We could see the entire assemblage of statues as we descended. The entrance guardian statues sternly look out to sea over a vast sandy bottom. Inside the gateway were more statues, already encrusted with yellow, green and orange sponges. The underwater shrine has been constructed around a huge boulder overgrown with corals and surrounded by schools of fish. Swaying orange seafans, red soft corals and technicolour sponges cover the rock while shimmering schools of tiny glassfish seem to flow among the statues. This is a very impressive dive and a must-do for visitors.

With the Reef Gardeners caring for and maintaining the reefs of Pemuteran, marine life in the area is now thriving. As the reefs rejuvenate, the reef fish are re-inhabiting the coral crevices and ledges. And all the other forms of life that make coral reefs the richest natural habitats on Earth are arriving. In this era of nothing but bad news for the environment, the Reef Gardeners brought us some good news.

For more information on the Reef Gardeners of Pemuteran, or for donations please contact Chris Brown via email at dive@reefseenbali.com

- 1 The office looks over the bay
- 2 Pipefish inhabit the inshore reefs
- 3 Map of Bali
- 4 The eye of a large mapped pufferfish



DID YOU KNOW...

2008 is the International Year of the Reef. There are many events planned throughout the year and around the world. You can even organise your own event. Why not run your own clean-up day at your local dive site? For more information on International Year of the Reef and ideas for activities visit <http://iyor.org>

CHECK THIS OUT!

Does conservation matter to you? Do you contribute to conservation efforts in your area or would you like to volunteer? Go to www.divetheblue.net/forums and share your opinions