
TOKORIKI ISLAND GIANT CLAM REGENERATION PROJECT

THE GIANT CLAM

The Giant Clam is one of the most fascinating inhabitants of the Fijian reefs. It is a creature of great beauty and wonder to snorkeling and diving guests alike. It is also impressive to say the least - the species *tridacna gigas* if

allowed to reach full maturity can live for 200 years and grow to the size of a bathtub! Indeed in the Lau Islands of Fiji the Islanders still use the shell of *tridacna gigas* as babies' baths!

Sadly the reefs and

pinnacles surrounding Tokoriki Island have been depleted of their stocks of Giant Clams. A serious cause for concern especially when one considers the odds that nature has stacked up against the Giant Clam.

FACTS & FIGURES

- ☺ *Tridacna Gigas*—the True Giant Clam is an Endangered Species.
- ☺ *Tridacna Gigas*—is the largest species of Giant Clam in the World growing to an impressive 1.5 metres and weighing up to 150kg!
- ☺ The Tokoriki Giant Clam Regeneration Project was the first project in the West of Fiji to plant Giant Clams and the only project to succeed in its aims.
- ☺ The Project now has around 40 mature *tridacna gigas* and 74 juvenile *gigas* clams—our largest is approximately 75cm long!
- ☺ Our Giant Clam site is called Magic Mushrooms and is only 5 minutes away from Tokoriki Island Resort—it is accessible to scuba divers of all abilities.
- ☺ Magic Mushrooms also has the rare and endemic Terove Giant Clam (Devil Clam). Ours is the first recorded devil clam in the West of Fiji.
- ☺ We are currently lobbying for the Magic Mushrooms site to be made into a Marine Protected Area (MPA).
- ☺ The Tokoriki Giant Clam Project has been funded by Tokoriki's Dive Operators with the generous assistance of Tokoriki Island Resort & PADI Project AWARE.

THE PROJECT

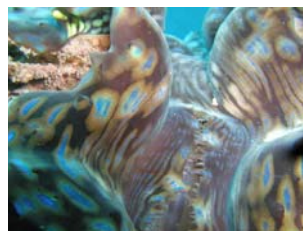
Dive Tropex Tokoriki in conjunction with the Ministry of Fisheries initiated 'The Tokoriki Island Giant Clam Regeneration Project' in 2000.

Three Species of Clams: *tridacna gigas* (Giant), *tridacna squamosa* (Fluted) and *tridacna derasa* (Smooth) have been planted around Tokoriki Island.

This was a significant conservation step for Fiji as our *tridacna gigas* were the first of their species to be reintroduced to Western Fiji – having become extinct in the whole of Fiji in the 1960s.



Tridacna Maxima



Tridacna Squamosa

THE LIFE CYCLE

To begin to understand the seriousness of the issue of Giant Clam depletion and the relevance of 'The Tokoriki Island Giant Clam Regeneration Project' it is important to understand the Giant Clam's Life Cycle...

It takes a Giant Clam between 7 and 9 years to reach sexual maturity. Giant Clams are her-

maphrodites (possessing both male and female sexual organs) but can not self-fertilize. Once mature and 'in season' the Giant Clam releases in to the sea millions and millions of microscopic eggs which drift in the ocean currents until they die (within a day or so) or by chance they happen upon Giant Clam sperm further down stream. If this chance meeting takes place between sperm and egg, fertilization may occur between a comparative handful. Once the Giant Clam egg is fertilized it needs the right environment in which to grow into a baby Giant Clam. It needs the right base: rocky substrate and plenty of sunshine – hence it needs to be in shallow water (1m – 5m deep). Therefore any fertilized eggs falling in to deeper water or on to shifting sands will die. Even if the tiny seed falls on to the the

right type of seabed it may still be washed away by strong currents.



Tridacna Gigas

Tridacna Terove



Octopus
- a natural predator of
Giant Clams

PREDATORS OF THE GIANT CLAM

In its early years the Giant Clam suffers heavy predation. Its bivalve shell is still not strong enough to protect it completely and its small size make it easy pickings for Triggerfish and Octopi.

The Triggerfish uses its immensely strong teeth to crunch through the shell; whilst Octopi choose to suffocate the Giant Clams by wrapping their tentacles around them for several minutes until they die. Octopi have the morbid habit of decorating the mouths of their lairs with the shells of their victims.

Still the Giant Clam must battle on in order to survive for the first few

years of life in the shallow waters of the Reef.

Human predation takes its toll; the Giant Clam is a favorite food of the Fijian, and an exotic shell to visitors. Indeed it is fair to say that we have been largely responsible for the demise of the Giant Clam.

If its luck holds the young Clam can grow unhindered in the shallow water and eventually it may become so large that it topples off the reef into deeper water. Here it is safe from free divers; and as the Clam gets larger it can cope happily with less sunlight and therefore deeper water.

THE TRIDACNA GIGAS GIANT CLAM—EXTINCTION IN FIJI

In the nineteenth century, traders sailed to Fiji in search of exotic commodities such as spices, copra and sandalwood.

The extinction of the *Tridacna Gigas* Giant Clam has been largely attributed to the collapse of the Sandalwood trade. Once Sandalwood became scarce, traders looked towards the sea for their profits. Sea Cucumbers and Giant Clams were considered the best exports to meet a growing de-

mand for such commodities in Asia.

In more recent times the problem for the Giant Clam has been one of overfishing.

As demand increases with human population growth, Giant Clams have been removed before they reach maturity.

This has undoubtedly played havoc with the Giant Clam population in the more populous areas

of Western Fiji.

So much damage has been done that *tridacna gigas* became extinct and *tridacna derasa* endangered in Fiji in the 1960s before having to be reintroduced from the Australian Great Barrier Reef in a joint Fijian/ Australian Fisheries Project.

Indeed our planted *tridacna gigas* were the first to be reintroduced to Western Fiji since becoming extinct.

WHERE DO OUR JUVENILE GIANT CLAMS COME FROM?



Baby Tridacna Gigas arrive at Tokoriki

The Giant Clams planted by 'The Tokoriki Island Giant Clam Regeneration Project' have all come, and continue to come from the Ministry of Fisheries Research Station on Makogai Island in Eastern Fiji.

There a team of Marine Biologists artificially seed and nurture various species of Clams before planting them on their own fringing reef;

Trochus shells, Pearl Oysters, Sea Grasses and Hawksbill Turtles are also reared for conservation and scientific purposes.

"Indeed our planted *tridacna gigas* were the first to be reintroduced to Western Fiji since becoming extinct."

FROM MAKOGAI ISLAND TO TOKORIKI ISLAND

Our Giant Clams come as juvenile clams (around 10cm long) from the Ministry of Fisheries Scientific Research Station on Makogai Island in the Lomaiviti Group of Islands far to the east of Fiji. (Around 160 miles from Tokoriki).

Our various batches of the endangered *tridacna gigas* clams have arrived to us by several means: boat, aeroplane, road, and more boats! Journey time between Makogai to Tokoriki is around 12 hours (providing seas are calm!).

In order to keep the Giant Clams alive they are wrapped in seawater dampened medical gauze

and placed in sealed heavy-duty bags. The Clam bags are then placed in a chilled icebox.

Marine Biologists from the Ministry of Fisheries take great care to ensure that on arrival at Tokoriki all the clams are alive and well.

PREPARATION

Plenty of preparation is necessary before the arrival of a batch of Giant Clams. Firstly rigid mesh cages need to be built to place the Giant Clams in for their first year of life. The cages offer pro-

tection from Octopi, Triggerfish and free divers. The cages are placed on the reef in advance.

Sacks of small dead coral rubble are collected. The coral rubble forms the base of the cage and the baby Clams nestle into it.

A further vital component is the location of a suitable site in which to place the Giant Clams. We test dived various sites around Tokoriki Island accompanied by Marine Biologists from the Ministry of Fisheries to choose the optimum sites for Giant Clam planting.

PLANTING GIANT CLAMS

On arrival at Tokoriki Island the Giant Clams are removed from their bags and placed in buckets containing seawater. It is at this stage that the Clams are measured and catalogued.

Once at the dive site the empty cages are placed on suitable level spots in an ideal depth of 5 metres. Next the sacks of coral rubble are carried down. Time is taken to provide the Clams with a nice even coral bed.

This complete, the Giant Clams are put back in plastic bags and carried down to the cages where they are then placed in catalogued order. Once planted the cages are closed and wired down.



Preparing to plant *Tridacna Gigas* Clams

"Tridacna Gigas—is the largest species of Giant Clam in the World growing to an impressive 1.5 metres and weighing up to 150kg!."

THE TOKORIKI GIANT CLAM REGENERATION PROJECT TODAY

Back in 2000 we placed 100 baby clams in protective cages on our "Magic Mushrooms" dive site, which is locally known as "vasua" (Giant Clam) in Fijian.

Cyclones, storms and natural predation have whittled our clams from 100 down to 40, but they have grown from approximately 7cm to nearly 70cm in length!

They have now reached sexual maturity, and (although it is impossible to tell as yet) should have spawned over the last two years.

For the last year or so we have been trying to buy some more *Tridacna Gigas* clams from Fisheries to add to our collection. Finally in May 2009 a batch of 74 juvenile *Tridacna Gigas* Clams made the

long journey from Makogai to Tokoriki.

Whilst at Tokoriki the Fisheries Department spent time cataloguing our mature Giant Clams—9 years on. They were astonished with their findings, heralding Tokoriki's Clam Project an eco-tourism success story!

THE FUTURE

The success of the Tokoriki Island Giant Clam Regeneration Project has enabled us to take things one step further.

The project reef is now considered of scientific importance.

As a result Fisheries have decided to work exclusively with Tokoriki in expanding the program and plan to send more clams to help increase stock levels further.

They also want us to start a colony of *Trochus* (top) shells—a large mollusc which is very important to the general health of the reef, being an algae eater, but is also of economic importance to local villagers.

Our immediate concern is for the protection of our Giant Clam Project Reef. At present its state is vulner-

able. A simple handshake agreement is in place between the villagers of Yanuya and Tavua Islands and ourselves to respect the aims of the project and to not take the clams.

Whilst most local Islanders have been fascinated by our program and helped to support its success by not poaching any of the clams.. we have in recent years lost very large mature clams to human predation.

As such we are actively working alongside the Fisheries Department and the Mamanuca Environmental Society to make this reef a Marine Protected Area (MPA).

This status would protect our Giant Clams as well as the aquatic life that live on the reef.



Tridacna Gigas—The True Giant Clam

"Makogai Island used to be the site of a Leper colony! In the 1980s the colony was closed and the Department of Fisheries set up a research station and marine park. All of our clams have been spawned by the enormous 150kg brood clams at Makogai."

Dive Tropex Tokoriki are PADI Project AWARE Environmental Award Winners for 2007 & 2008

Will and Alex—the owners of Dive Tropex Tokoriki, a PADI Gold Palm 5 Star Dive Centre and Boating Operation have lived and worked in the Mamanuca Region for 10 years. Their knowledge of the local aquatic life is unsurpassed.

As Go Eco Operators they are committed to environmentally responsible business practices and to providing guests of Tokoriki Island Resort with experiences that enhance visitor awareness of the local aquatic environment.

They conceived the Tokoriki Island Resort Giant Clam Regeneration Project back in 2000, after reading a magazine article of a similar program in the Philippines.

The Tokoriki Giant Clam Regeneration Program is an example of a small scale project that can have a long term impact in the health of Fiji's reefs.

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