

< Whale shark feeding at the surface
> Manta ray at a cleaning station with a substantial shark bite wound

TOFO'S

> ON THE SOUTHEASTERN SEABOARD OF AFRICA, ALONG A 200KM STRETCH OF THE MOZAMBIQUE COASTLINE, MOTHER NATURE HAS CONSPIRED TO CREATE WHAT CAN ONLY REALLY BE DESCRIBED AS THE PERFECT UNDERWATER BIOLOGICAL STORM.

MEGA FAUNA

In this remote area several major African and Indian Ocean currents converge, producing some unique counter-cyclic eddies that suck up rich nutrients from the deep trenches to the south and create huge quantities of zooplankton, the life source of oceanic mega fauna. This unique mechanism has occurred largely unnoticed for thousands of years, and has played a major role in the evolution of two creatures at the top of the mega fauna food chain – the whale shark and manta ray.

The area, in the southern Mozambique province of Inhambane, hosts some 20% of the world's whale sharks and an estimated 1400 individual manta rays, one of the largest populations of manta rays identified anywhere in the world. Ironically it was

one of the scourges of Africa – tribal warfare which descended into the protracted and very bloody Mozambique civil war – that kept this unique natural phenomenon hidden from the world. Peace has finally returned to Mozambique, but other threats are impacting significantly on this unique marine mega fauna aggregation and now threaten its survival.

Mega Fauna Aggregations

These occur when natural circumstances combine to create the ideal conditions for large groups of fish or mammals to gather at a specific geographical location. Many, such as South Africa's sardine run, South Australia's giant cuttlefish or Tonga's whales, are well known, while others are still to be discovered. But they typically all

have the common denominator of seasonal influences creating the pre-conditions for an aggregation to occur once or maybe twice a year for a limited time. Creatures that aggregate are basically 'hard-wired' to make their way to a location when they sense the pre-conditions developing.

For example, at Ningaloo Reef in northwestern Australia some seven to nine days after the March or April full moon, a massive coral spawning attracts large numbers of whale sharks which remain for two to three months to feed on the resultant zooplankton.

But in southern Mozambique the unique counter-cyclic eddies produce a rich year-round source of zooplankton concentrated

in 200km of coastline from Zavora in the south to Pomene in the north. The reliable and rich food source makes the Tofo area extremely important.

Praia Do Tofo

The beachside village of Tofo in a scenic bay about 16km from the regional centre of Inhambane, has become the epicentre for multitudes of tourists arriving to experience the mega fauna first-hand. Several dive centres, guesthouses and small hotels have opened to accommodate the visitor influx, which is very positive in a poor country desperate for growth.

Tofo is also now the base for some groundbreaking research into both mantas and whale sharks and amazing things are

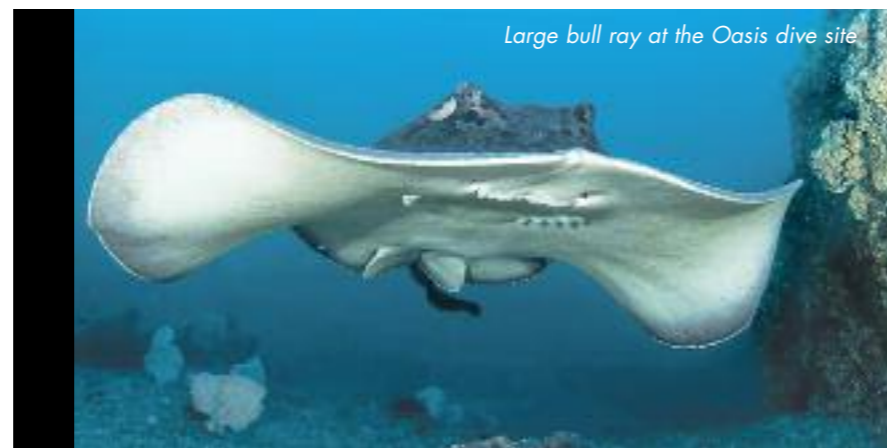
being discovered about these wonderful creatures. Leading the research are marine scientists Dr Andrea Marshall (manta rays) and Dr Simon Pierce (whale sharks). Together they've created the Foundation for the Protection of Marine Megafauna, which is based at and supported by the Casa Barry Lodge. Every Monday evening Andrea Marshall gives a presentation on her work with manta rays and on Wednesday's Simon Pierce covers his research on whale sharks. On Friday nights PhD student Chris Rohner does an excellent talk about the overall marine life of the Tofo area.

I spent two weeks in Tofo; luckily I arrived on the weekend and caught Andrea's talk on the Monday night. I was stunned – it

was factual and interesting, and she also has a great repertoire of one-liners which entertain and enthrall. I went twice to all three presentations as they were so good and became a little concerned that I might be reported to the local police for stalking! Tofo itself is small but very pleasant with a few nice restaurants and bars, but if you go there, plan your trip so you can attend all three presentations – you won't regret it!

Fast Food – Manta Style...

One of the most significant things about the manta rays in Mozambique, besides their overall numbers, are the high percentage of shark bite injuries. Andrea Marshall's research indicates that about 75% of the identified mantas have these injuries and a closer look at the actual wounds has



Large bull ray at the Oasis dive site



Schooling fish, Oasis dive site



Resting leopard shark at the Amazon dive site

: DON SILCOCK
www.indopacificimages.com



confirmed that while the majority are the result of attacks by tiger and bull sharks, 11 other sharks have been positively identified as predators.

The attacks seem to be random and opportunistic – a shark spots a manta, attacks from behind in the ray's blind spot, and manages a single bite before the startled manta accelerates away to safety. It's almost (but not quite) a win-win situation – the shark has had a quick snack while the manta has survived the attack; because all a ray's main organs are concentrated in its core, such attacks are rarely if ever fatal.

Manta Cleaning Stations

Large marine creatures inevitably have significant numbers of tiny parasites that are extremely difficult for them to remove and while breaching is known to be a way of communicating, it's also thought to be a form of shock treatment used to shake them free.

Large reef fish and moray eels develop relationships with smaller fish and shrimp, allowing them to feed on their parasites under a temporary truce in the eternal cycle of hunt and eat. Mantas frequent cleaning stations, where they hover patiently while cleaner fish perform a similar routine. Cleaning stations are the perfect place to observe these magnificent creatures, but it's unusual for individual mantas to stay for much more than an hour.

But in the Tofo area it's normal for mantas to remain for several hours at a time because not only are parasites being removed, their wounds are being cleaned of dead and infected flesh, allowing them

to fully recover from their attacks. Andrea Marshall has noted that different types of cleaner fish service different parts of the mantas, with sergeant majors cleaning the manta's mouths, cleaner wrasse doing the honours on the gills and butterflyfish providing the wound management treatment...

Manta Crèche?

Andrea Marshall arrived in Tofo in 2003, looking for subject matter for her PhD in marine biology and when she discovered the sheer numbers of mantas and whale sharks in the area, quickly realized she'd found the right spot. Describing it "like choosing between chocolate and pizza" she elected to study the mantas and has since built up a visual database of over 700 manta rays. Her subsequent research has established that around 80% of the

manta rays in the area are female and at least 55% of the overall population is mature and at breeding age. These statistics, together with the numerous different pregnant females regularly sighted and the constant supply of zooplankton, indicates that Tofo is almost certainly the first recorded manta ray breeding site in the world.

Tofo Whale Sharks

The biggest fish in the sea are almost a constant fixture in the Tofo area, drawn by the availability of zooplankton. A fully grown whale shark can reach almost 20m in length and 34 tons in weight by the time they reach full maturity at about 30 years old, but these leviathans of the sea are rarely if ever seen in the Tofo area. Instead research by Dr. Simon Pierce has

established that the area is dominated with juveniles in the range of 3-10m.

Simon, a Kiwi marine biologist who readily admits he'd never seen a whale shark before arriving in Tofo in 2005, has established an equally impressive database to Andrea Marshall's manta ray files. This data, together with aerial surveys by South Africa's Natal Shark Board has shown there's a very high concentration of whale sharks in the Tofo area of around three per square km, which means around 70-80 of them at any one time.

Whale Shark Migration

Whale sharks are solitary oceanic creatures, so for such numbers to gather in the Tofo area indicates the region plays a significant role in the growth cycle to full

maturity. Little is currently known about overall whale shark migration patterns, but Simon Pierce's data has shown that around 70% of the juveniles recorded in the Tofo area are never seen there again. They're just passing through and the Tofo corridor is an important transit and feeding area for whale sharks as they mature.

Conservation

The obvious benefit of intensive and regular research in a mega fauna hotspot like Tofo is that over time a clear picture starts to emerge about the overall health and vibrance of its star attractions. Unfortunately there are indications of a possible decline in both whale shark and manta populations, but whether this is an actual decrease or just a reduction in their 'sightability' in the usual locations is not

Tofo Code of Conduct

To minimize the impact of increasing numbers of tourists visiting Tofo's mega fauna, the dive operators have established a code of conduct in conjunction with Andrea Marshall and Simon Pierce. I was pleasantly surprised by how well and how sensibly the Diversity Scuba staff implemented this. Underwater, divers may not enter what I'd call the 'comfort zone' of manta rays at cleaning stations. Designated observation areas for divers prevented the mantas being intimidated by the arrival of large numbers of noisy underwater animals... As often happens with intelligent creatures, the mantas did come to investigate us after some time – encounters can be just as intimate but are on their terms.

Similarly, to avoid damaging critical reef infrastructure, guides carefully ensured no divers kneeled on or otherwise damaged any part of the Tofo reefs. All organized whale shark interaction is part of a 'safari' – snorkelers are taken out by RIB's launched from the beach – South African style... There's a large feeding area rich in zooplankton just south of Tofo and the safari boats cruise this looking for whale sharks. When one is spotted, great care is taken to ensure minimal stress is placed on them. Snorkelers quietly enter the water 20-30m upstream of the shark so that it swims into the waiting group, who've been strictly advised not to try to obstruct the sharks in any way. Experience has shown this delivers the best and closest interaction – any closer forces the shark to 'bank' by turning away and diving deeper.



Top, left to right:
 • Schooling fish at the Amazon dive site
 • Leaf scorpionfish
 • Large potato cod and divers
 • Large scorpionfish blending in with its temporary habitat

Left, top to bottom:
 • Andrea Marshall and Simon Pierce
 • Divers on the Diversity Scuba dive-boat
 • Downtown Tofo...
 • The Manta and Whale Shark Research Centre



clear at this time. Of major concern is the use of longline and net fishing to satisfy the ever-increasing demand for shark fins from locally based Chinese 'businessmen', of which manta rays are basically collateral damage rather than the main game.

On my last day in Tofo I witnessed first-hand a sickening example of this. I was getting a nitrogen break before the long flight back to Sydney and was out early morning taking photographs when I saw a tiny local fishing boat returning from its night's work. It was an interesting subject, so I went down to watch the boat being pulled up on to the beach by the weary fishermen. Then I realized that under the nets piled up on the boat was a barely alive but fully mature mobula ray. To my horror the ray was pulled out of the boat and slaughtered in front of me as I struggled to capture the scene. Then I saw one of the fishermen had a shark fin in a plastic bag and realized the victim had obviously just been thrown over the side

after being parted from its prized appendage. It was shocking to behold, made even worse by the realization that similar events had probably occurred every day I'd been in Tofo.

The Solution?

While it's very easy to self-righteously tell the Tofo fishermen they shouldn't do such things, the fact is that my stomach was full from a pleasant guesthouse breakfast. The fishermen need to earn money to feed themselves and their families. With no other way to do this but take their catch from the sea, the lure of easy money from Chinese 'businessmen' is understandable.

Andrea Marshall and Simon Pierce understand this mechanism very well and are trying to establish a Marine Park in the critical 200km Tofo corridor that will achieve the dual objectives of protecting the area's mega fauna while allowing the local population to benefit – not just the hotel and dive shop owners...

Easier said than done, but their work over the last six to eight years has provided essential insight in to the most problematic areas, such as the southern village of Ligoga which has become a manta ray hunting black spot.

An all-encompassing southern Mozambique Marine Park, with no fishing at all is highly unlikely to either get approved or be successful. But if the key locations can be effectively protected it could ensure the survival of the very special mega fauna of the Tofo area.

Let's hope they're successful...

> LINKS:

- <http://marinemegafauna.org/>
- www.peri-peridivers.com/conservation
- www.casabarry.com
- www.diversityscuba.co.za



< The fully grown mobula ray in the fishing net



< Death on the beach



> The fisherman displaying his prize



< The sad remains... it's hoped a Marine Park will also provide some income to the local people

Destination Details

Tofo is pleasant and picturesque and owes its relative prosperity to the marine mega fauna and those who come from all over the world to see them. The 'town centre' is a collection of huts and stalls selling T shirts, beers and various other items and comes alive on a Sunday afternoon when many people come from Inhambane after morning church to sit on the beach and drink the local beer.

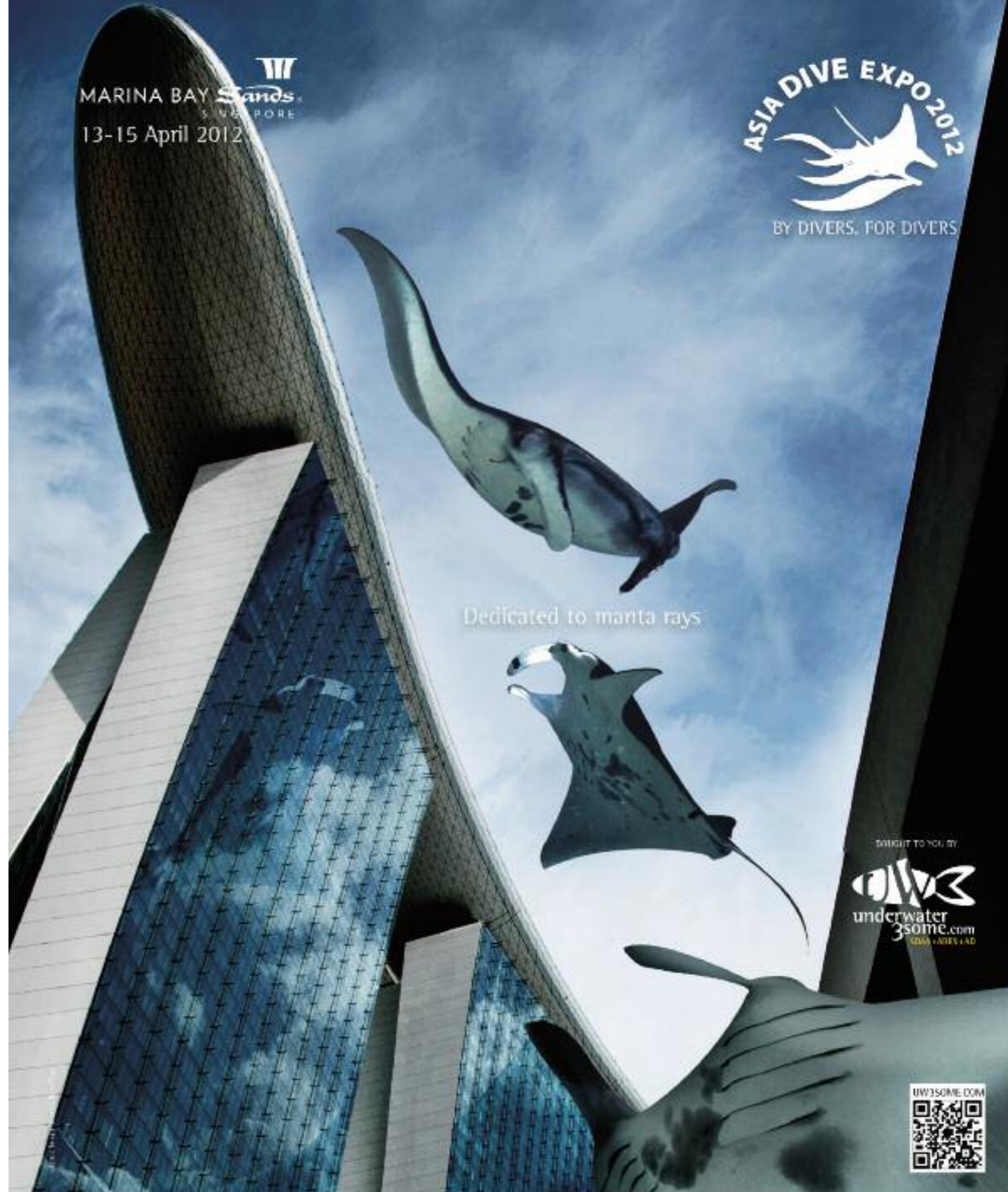
By about five p.m. there was a distinct street party feel, but by about 8pm everybody had gone and the empty beer bottles were the only tell-tale sign...

Dive Operators There are now several dive operators in town and all appear to be following the code of conduct. I dived with Diversity Scuba run by expat Englishman Mark Whaley and I found them to be very well organized and efficient. I was very impressed with how well the local Mozambique dive guides and Divemasters have been trained by Mark and his team.

Where to stay? There was no major hotel in Tofo when I visited, but renovations were underway of the rather rundown hotel Tofo Mar which should address that. Most accommodation was in guesthouses and lodges, which I stayed in and was kindly arranged for me by Christophe Chazot of Terra Profunda www.terra-profunda.com

Getting there and general logistics

- The nearest airport is the regional centre of Inhambane, a 40-minute drive from Tofo.
 - LAM, the national airline of Mozambique, has regular flights from Johannesburg in South Africa.
- Though slightly quixotic, Inhambane is an international airport and the solitary customs and immigration official will grant you a visa on arrival, paid in US\$.
- There was only one ATM in Tofo, at the supermarket and petrol station on the edge of town, but it only takes Visa cards. There is no bank...



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