

# *Mega Fauna Off Africa* Mozambique

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Giant grouper waits patiently for its next meal at Manta Reef

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. For it is in this remote area that 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.



Giant frogfish at Salon (above). The Diversity Scuba dive boat (left) heads down the coast to Krakatoa. PREVIOUS PAGE: Colorful local fishing boats in the warm morning sun atTofo beach in Mozambique



This unique mechanism has been occurring largely unnoticed for thousands of years, and has undoubtedly played a major role in the evolution of two creatures at the tip of the mega fauna food chain—the whale shark and the manta ray.

The area, in the southern Mozambique province of Inhambane, is host to some 20 percent of the world's population of whale sharks and an estimated 1,400 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.

But times have changed, and peace has returned to Mozambique, but with it has come other threats that are having a significant impact on this unique marine mega fauna aggregation and now threatens its very survival.



**Mega fauna aggregations**

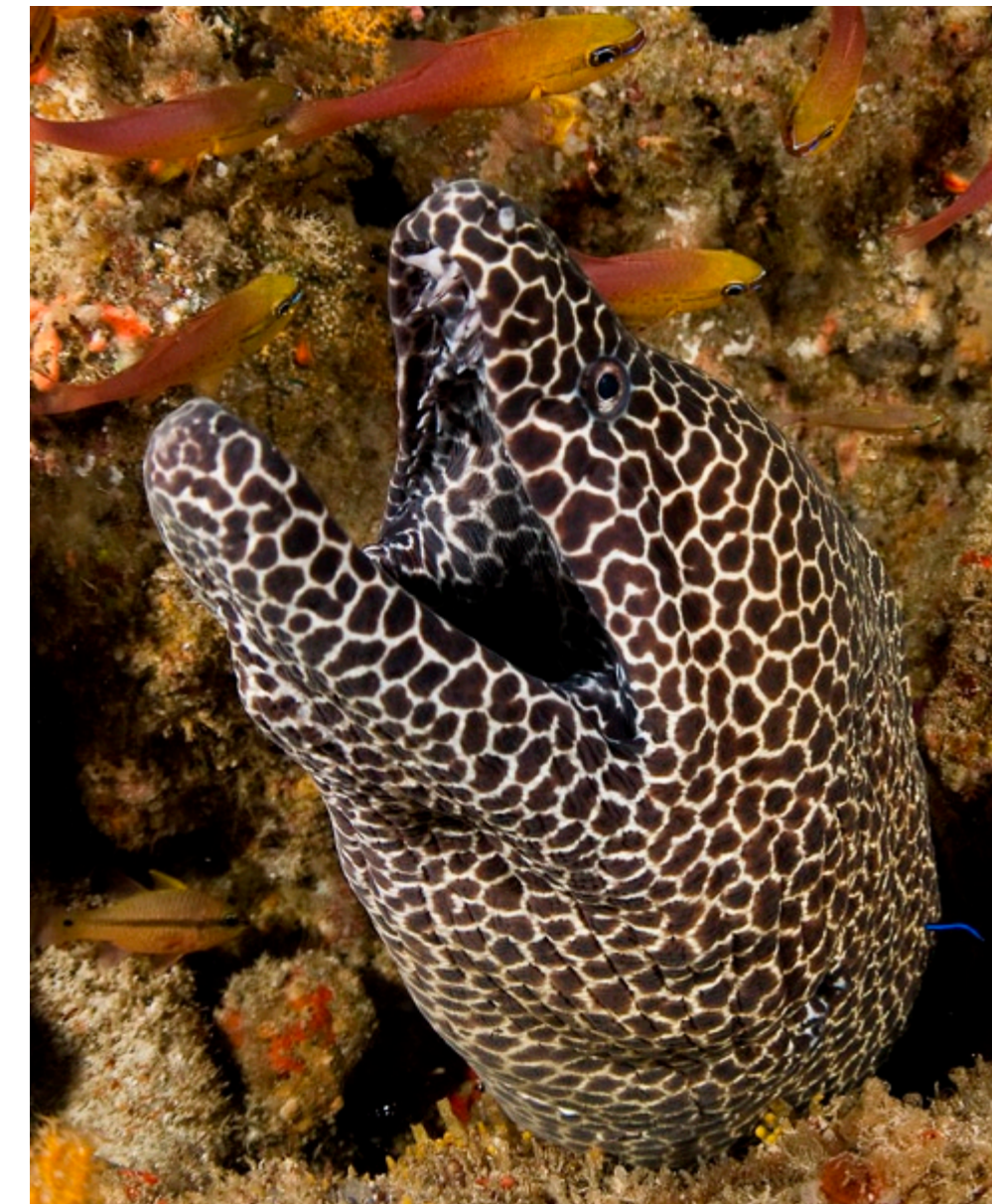
Aggregations of marine creatures happen when a combination of natural circumstances occur and create the ideal conditions for large groups of fish

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 very well known,

CLOCKWISE FROM ABOVE: Small school of Moorish Idols at Arena; Large scorpion fish blends in with reef; Whale shark "banks" as it dives; More schooling fish at Arena—a very rich dive site!





Large bull ray (above) cruises past at Manta Reef; Superbly camouflaged giant frogfish at Galleria (top left); Honeycomb moray eel at Manta Reef (bottom left)

while others are still to be discovered. But they typically all have the common denominator of seasonal influences creating the pre-conditions for the aggregation to occur.

In other words, it happens once or maybe twice a year for a limited time only, and the creatures that aggregate are basically "hard-wired" to make their way to the location, as 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 is a massive coral spawning, which attracts large numbers of whale sharks that stay in the area 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 a 200km stretch of coastline from Zavora in the south to Pomene in the north. The availability of such a rich food source makes the Tofo area an extremely important one to marine mega fauna.

### Praia Do Tofo

The small beachside village of Tofo, situated in a picturesque bay about 16 kms from the regional center of Inhambane city, has become the epicenter for the large numbers of tourists

visiting the area to experience first-hand the mega fauna.

Several dive centers have set up shop and numerous guest houses and small hotels have opened to accommodate the influx of tourists, which is all very positive in a poor country desperate for growth. Tofo has also become the base for some ground-breaking research into both manta rays and whale sharks and some quite amazing things are being discovered about these wonderful creatures.

Marine scientists Dr Andrea Marshall and Dr Simon Pierce are leading the research, with Marshall focused on manta rays and Pierce on whale sharks.



Together they have created the Foundation for the Protection of Marine Megafauna ([Marinemegafauna.org](http://Marinemegafauna.org)), which is based at and supported by the Casa Barry Lodge ([Casabarry.com](http://Casabarry.com)) in Tofo.

Every Monday evening in Tofo, Andrea Marshall gives a presentation on her work with manta rays, and on Wednesday's, it is Simon Pierce's turn to talk about his research on whale sharks. Then on Friday nights, PhD student Chris Rohner does an excellent talk about the overall marine life of the Tofo area.

I spent a total of two weeks in Tofo and was lucky enough to arrive over the weekend and caught Andrea's talk on the Monday night. Frankly, I was stunned at what she presented—not only was it factual and interesting, but she also has a great repertoire of one-liners that keep you fully entertained as well as enthralled.

So interesting were all three presentations that I went twice to all of them and became a little concerned that I might



CLOCKWISE FROM TOP LEFT: Large puffer fish at Clown Fish Reef; Cruising leopard shark at Oasis; Divers and giant grouper at Oasis; Scorpion fish blends in at Galleria



Rafael (left), one of Diversity Scuba's Mozambiquan dive masters; Leopard shark at Arena (above); Schooling surgeon fish at Oasis (left); One of the many crocodile fish at Crocodile Rock (below)

Mozambique, besides their overall numbers, are the high percentage of shark bite injuries. Andrea Marshall's research indicates that about 75 percent of the identified mantas have these injuries, and a closer look at the actual wounds has confirmed that while

the majority are the result of attacks by tiger and bull sharks, a total of 11 other sharks have been positively identified as the predator. The attacks appear to be random and opportunistic whereby the shark spots the manta and then attacks from behind in the ray's blind spot and manages a single bite before the startled manta accelerates away towards safety. It's almost—but not quite—a win-win situation, because the shark is happy to have had a quick snack while the manta is presumably happy to have survived the attack, and because all of it's main organs are concentrated in it's core, such attacks are rarely, if ever, fatal.

**Manta cleaning stations**  
Large marine creatures inevitably suffer from significant numbers of tiny parasites that are extremely difficult



This giant grouper was so close I could tell if it had halitosis

be reported to the local police for stalking.

Tofo, itself, is a small but very pleasant place 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



Reef manta ray at one of the cleaning stations at Manta Reef (left); The shark bite wound on this reef manta is clearly visible (below)

Her subsequent research has established that around 80 percent of the manta rays in the area are female and at least 55 percent 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, indicate 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 as they are by the availability of zooplankton.

A fully grown whale shark can get to 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 from 3-10m.

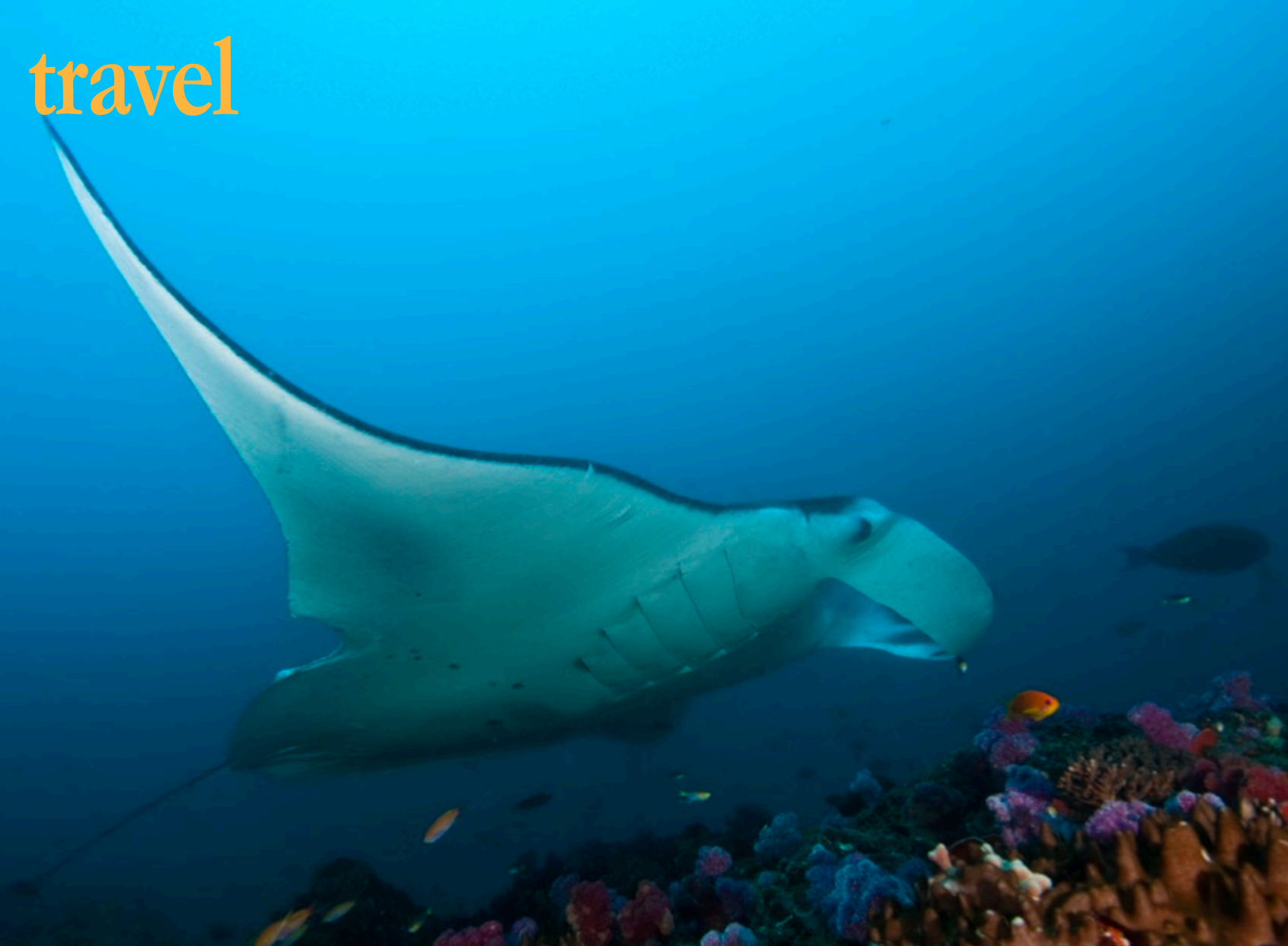
Pierce, a Kiwi marine biologist who readily admits he had never seen a whale shark before arriving in Tofo in 2005,

has established an equally impressive database to the one on manta rays built up by Marshall.

This data, together with aerial surveys by South Africa's Natal Shark Board has shown that there is a very high concentration of whale sharks in the Tofo area of around three per square kilometer, which means around 70-80 of them at any one time.

**Whale shark migration**

Whale sharks are solitary oceanic creatures, so for so many of them to gather as they do in the Tofo area



for them to remove, and while breaching is known to be a way of communicating, it is also thought to be a form of shock treatment used to shake them free.

But just as 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—so do mantas frequent specific locations, called cleaning stations, where they will hover patiently while cleaner fish perform a similar routine.

Cleaning stations are the perfect place to observe these magnificent creatures as they

linger and allow the parasites to be removed. However, it is unusual for individual mantas to remain around a cleaning station for much more than an hour.

But in the Tofo area, it is quite normal for mantas to remain for several hours at a time, because not only are their parasites being removed, their wounds are being cleaned of dead and infected flesh, thus allowing them to make a full recovery from their attacks.

Interestingly, 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 honors on the gills and butterfly fish providing the wound management treatment.

**Manta crèche?**

Marshall arrived in Tofo in 2003, looking for subject matter for her PhD in marine biology, and when she discovered the sheer numbers of manta rays and whale sharks in the area, quickly realized she had 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.



Mozambique



CLOCKWISE FROM ABOVE: A whale shark feeds on plankton near the surface; Schooling fish at Manta Reef; Another giant grouper at Manta Reef waits patiently for its next meal; Electric ray at Clown Fish Reef

indicates that the region plays a significant role in the growth cycle to full maturity.

Very little is currently known about overall whale shark migration patterns, however, Pierce's data has shown that around 70 percent of the juveniles that visit the Tofo area are never seen again—meaning that they are just passing through and indicating that the Tofo corridor is an important transit and feeding area for whale sharks as they mature.

**Conservation**

The obvious benefit of having such intensive and regular research in a mega fauna hot spot like Tofo is that over time a clear picture starts to emerge about the overall health and vibrancy of its star attractions.

Unfortunately, there are clear indications of a possible decline in both the whale shark and manta ray populations, but whether this is an actual decrease or just a reduction in their 'sightability' in the usual locations is not clear at this point in time.

Of major concern is the use of long line and net fishing related to satisfying the ever-increasing demand from locally-based Chinese 'businessmen' for shark fins, of which manta rays are basically collateral damage rather than the main game.

Aaron Gekoski with his, *Shiver: A finning crisis* story, documented this very well in issue #41 of *X-RAY MAG*, but on my last day in Tofo, I also witnessed first hand a sickening example.

My two weeks of diving over, I was getting a nitrogen break before the long

flight back to Sydney and was out taking early morning photographs when I saw a tiny local fishing boat returning from its night's work.

Thinking this may provide a scenic



photo opportunity, I positioned myself to catch 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 promptly pulled out of the boat and slaughtered in front of me, as I struggled to capture the







scene. Then, I saw that one of the fishermen had a shark fin in a plastic bag and realized that the victim had obviously just been thrown over the side after being parted from its prized appendage.

It was a totally shocking scene to behold and one that was made even worse by the slow realization that similar events had probably taken place every day I had been in Tofo, had I actually looked for them.

**The solution?**

While it is very easy to self-righteously tell the Tofo fishermen that they should not do such things, the fact is that my stomach was full from a pleasant breakfast at my guesthouse while the fishermen



need to earn money to do the same for themselves and their families. With no other way to do it but take their catch from the sea, the lure of easy money from the Chinese 'businessmen' is understandable.

Marshall and 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 into 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 are successful. ■



CLOCKWISE FROM TOP LEFT: Downtown Tofo; Fishermen drag their boat up onto the beach; The mobular ray is butchered on the beach; The fisherman and the freshly taken shark fin; The shark fin and the remains of the mobular ray (inset)



IMAGES THIS PAGE:  
Feeding whale shark

# Mozambique

entering the personal space of Tofo's mega fauna, a code of conduct has been established by the dive operators in conjunction with Marshall and Pierce.

I was pleasantly surprised to see how well and how sensibly all the staff at Diversity Scuba, who I dived with while in Tofo, implemented this.

Underwater, divers are not allowed to enter what I would call the "comfort zone" of the manta rays at the cleaning stations. Instead, there were designated observation areas where the divers were positioned, and these tactics meant that the mantas were not intimidated by the sudden appearance of a large number of noisy underwater animals.

As often happens with intelligent creatures, the mantas would come and investigate after some time, meaning that the encounters can be just as intimate but very much on their terms.

Similarly, to avoid damaging the critical reef infrastructure, all the guides were very careful to

ensure none of the divers kneeled or otherwise damaged any part of the Tofo reefs.

With the whale sharks, all the organized interaction with them is part of a 'safari' whereby parties of snorkelers are taken out on RIB's launched from the beach South African style.

There is a large feeding area just to the south of Tofo, which is rich in zooplankton, and the safari boats cruise the area looking for whale sharks. When one is spotted, great care is taken to ensure that minimal stress is placed on them.

The snorkelers are dropped quietly in the water 20-30m upstream of the whale shark, so that it swims into the waiting party, who have been strictly advised not to try and obstruct the sharks in anyway.

Experience has shown that this produces the best and closest interaction, and any closer interaction forces the shark to 'bank' by turning its back on the potential threat and diving deeper. ■



**ABOUT TOFO**  
Tofo is a pleasant and picturesque place that owes its relative prosperity to the marine mega fauna and the people who come from all over the world to see them.

The 'town center' 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 in the afternoon there is a distinct street party feel, but by about eight, everybody

has gone, and the empty beer bottles are the only tell-tale sign.

**GETTING THERE**  
The nearest airport to Tofo is the regional center of Inhambane, a 40-minute drive from Tofo.

LAM, the national airline of Mozambique, has regular flights from Johannesburg in South Africa.

Although slightly quixotic, Inhambane is an international airport and the solitary customs and immigration official will grant you a visa on arrival, paid with US\$25.

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.

**WHERE TO STAY?**  
There was no major hotel in Tofo when I was there, although major renovations were underway of the rather rundown looking hotel Tofo Mar, which should address that. Most accommodation seems to be in guest houses and lodges, which is what I stayed in and was kindly arranged for me by Christophe Chazot of Terra Profunda ([www.terra-profunda.com](http://www.terra-profunda.com)).

**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 particularly impressed with how well the local Mozambique dive guides and dive masters have been trained by Whaley and his team.

**TOFO CODE OF CONDUCT**  
To minimize the impact of a relatively large number of tourists