The story of the elusive Dugongs of Bazaruto

Images and story by **Cormac McCreesh**

Chapter I

This is a story of how a large sanguine, sea grass-eating mammal humbled and taught me about the inter-connectedness of life and the impact we human beings are having on our planet and each other. It is also a story of a dream of committed people; one that remains tantalisingly close but is a long way from being fulfilled. In short, it is a story that is incomplete and this is only the first chapter.

As an underwater photographer, I have had my share of close encounters with large pelagics and mammals and been frustrated by small critters defying me macro shots. But I've always managed to get the photo. And photographing Dugongs of the Bazaruto Archipelago was, I thought, going to be a slam-dunk easy exercise.

After all, what could be more difficult? Dugongs are slow-moving, large, cow-like creatures that like to spend their days munching on sea grass while occasionally luring ancient mariners to their doom by pretending to be mermaids.

My story begins in the early days of African Diver Magazine when Paul and I came across an interesting web blog describing the rescue of a Dugong calf and its mother from a near drowning in a fisherman's gill net. What made the story compelling was that because of the work being done there by various environmental NGO's, the fishermen were encouraged to release the animals as well as bring them to the resident NGO scientists and staff for rehabilitation.

Further investigation on Google took me to the website of the Bateleurs Flying Group who conducted an aerial survey of the Dugong of the Bazaruto National Park in Mozambique, in February of 2008.

This was encouraging information for me to digest as I'd spent some time in the Inhambane area of Mozambique during 2002 and been told by many people that Dugong used to frequent the area but had been fished out and were no longer seen there.

I continued to gather and search for information on Mozambique's Dugongs. At first I approached the project casually as I didn't hold much hope for there to be any remaining population of Dugong in Mozambique because everyone I spoke to told me that the population had been decimated by fishermen who caught and ate anything that moved in the sea.

And just as I was beginning to give up hope in August of 2010 I met Karen Allen of the Endangered Wildlife Trust (EWT) who had just started a program to protect the "endangered Dugong population of the Bazaruto Archipelago". Her project and the work she had done to that point excited me – a population of around 120 Dugong had been assessed in the Archipelago and the EWT was going to protect them. The dream had vitality!

But the information Karen gave me was not all good. She told me that although Dugongs were now (recently) protected in Mozambique, over-fishing, illegal fishing, gill netting and environmental encroachment were decimating the population and that it wouldn't be long before this Dugong population too would be gone forever.

She told me of how few resources were available to the authorities to patrol and "police" the area to protect the Dugong, that it would take money, effort, commitment and people to save this fragile population.

Artisanal fishermen on Dhow

Artisanal fishermen repairing nets

And so, on the 17th of November last year I flew into Vilanculos, the busy and growing town that is the Archipelago's nerve centre. After the chilly air-conditioned interior of the plane, the furnace blast of hot Mozambican air that slapped me through the face as I disembarked was welcoming and a perfect reminder of what is special about being a visitor to any of Mozambique's shores. I breezed through customs and met my host, Michael Klue of Big Blue.

Later, at my lodge, I looked out onto the Archipelago's islands marooned in a calm shallow sea. Blue variations of colour characterised the shallows, deep channels and sea grass beds in front of me. Here and there Dhow's manned by artisanal fishermen slowly tacked in the space between the shimmering blue water and the powdery blue sky. It was low tide and moored boats lay flaccid on the sandbanks. Artisanal fishermen waded the shallows looking for fish and crabs. A lone dog prowled the water line inspecting, sniffing and searching. A young boy walked past, in his hand 20 or 30 small fish strung together on a line.

I made my way down the dunes to the beach. Past tethered goats and treading a well-worn path I accessed the beach amidst several fishermen repairing a net; a a long net – at least 200 metres in length and noticed that where they were working is a Dhow and boat building area … on the beach and complete with hand-made tools.

The littoral zone I wandered was pooled with oily patches of water (from aged and ailing outboard motors) marooned by the retreating tide. Great piles of dead sea-grass lined the high tide mark and Dhows lay limply on their keels awaiting the incoming tide. Here and there, locals examined the catch of the artisanal fishermen I saw wading the shallows earlier. On closer inspection, I discovered that the main catch is crab with an occasional dogfish or sea cucumber. And it became clear that their method of catching is a long steel spear with a wickedly sharp barb.

Later, in the bar, I met several expatriate South Africans. South Africa's SASOL had made a large investment to exploit natural gas in the area and there is a huge expatriate workforce on the ground. Other expatriates are more entrepreneurial: farmers, lodge owners, construction and building contractors, hardware suppliers … Vilanculos seemed to be on the precipice of a boom and everyone wanted to be a part of it.

So in the space of an afternoon and evening I'd already seen indications of what Karen had told me about, having ticked off over-fishing (I noticed curried crab on the menu) and, now, environmental encroachment. Development was alive and kicking in Mozambique.

The following day, operation Dugong portrait began. I was up early, at 5am. Already the sun was well advanced in the sky and there was activity all around. Leisurely I set myself up for the day and checked and double-checked my gear. At around 630am I slurped down my last coffee, gathered my kit and headed off to Big Blue's dive centre. There I met with Michael and my two guides for the day (Zito and Antonio) and we loaded up Spanish Fly; our boat.

Michael, Zito and Antonio are easy-going and welcoming guys. I immediately felt at ease, especially when Zito promised me (unequivocally I may add) Dugongs on my first day out. We set out on a course for Bazaruto Island following the sea-grass beds, stopping every now and then to ask artisanal fishermen about Dugong sightings … each time the answer was negative. Nevertheless, Zito remained positive.

Out there, among the sea-grass beds, deep blue channels and myriad Dhows and fisherman I realised the Herculean task I had set myself. I now had time to assess the boating activity and it was clear that boating is a significant factor contributing to the shyness and scarcity of the Dugong. And while October to December is a closed period for netting, the abundance of netting has caused the death of many Dugongs.

Crab spear fisherman

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In addition, the early morning wind had stirred up an annoying surface chop, which worried me because Dugong do not surface with a splash or tell-tale (like dolphin or whale) and spotting them in the choppy waves was going to be near impossible. Out there too, I could see that water visibility was going to be a huge factor – I could see sediment and particles and plankton in the water.

We arrived at the Southern end of Bazaruto island and toned the engines down to a gentle dawdle. Michael and I kitted up and readied our gear. I dropped overboard to get a preliminary exposure and my fears were confirmed … the visibility was around a metre and a half with a wicked current flowing. Various forms of zooplankton and jellies stung my exposed arms and legs. I immediately took my strobes off my housing as I didn't want backscatter spoiling the images.

We drifted around in the channel between Bazaruto and Benguerra islands for some 40 minutes and I slipped into a funk thinking about landscape or wedding photography as an alternative career. There was a deep silence on the boat; four set of eyes scanned the water around us when suddenly, Zito shouted, "there, there … get ready". Disbelievingly I looked over to where he was pointing and saw a brown, whiskered snout break the surface … Dugong; it was there!

Frantic, but trying desperately to be quiet, I slipped into the water while Zito and Antonio directed me. Head in the water, camera in hand I headed in the direction they were pointing me when I saw it. A big, brown, rotund shape with a cute dog-like face slowly cruised past me giving me enough time to fire off two shots on my camera. And then it was gone.

Michael and I high-fived each other in the water and then sped off as Zito and Antonio directed us again. We flashed across the surface and then duck-dived … 8 metres down I saw glimpses of its tail and then it was gone again. And so it went on … for three hours we slowly finned across the surface under Zito and Antonio's directions, duck diving down to the sea grass beds when the Dugong appeared, sometimes managing a few camera shots but mostly not.

Predicting the direction of our Dugong was nearly impossible – it followed the sea-grass beds randomly, surfacing every 10 minutes or more to breathe briefly. Eventually the tidal currents sapped our strength and we gave up as our Dugong headed out into the channel and deeper water to take advantage of the incoming high tide.

For three more days we carried out the same routine. We learned to be quiet in the water and Christine (for by now Zito had christened her … or him) gradually became more trusting of us. She surfaced more often and closer to our boat but the tidal currents and the highly fecund plankton-filled water made underwater photographs of her next to impossible. I ended up with frame after frame of Dugong shapes obscured by countless plankton and jellyfish, despite not using my strobes.

Each day when she left the inter-island channel we followed her, hoping she would take us to better visibility water. But each day, when she chose to, she would disappear and we would lose her.

Over four days we sighted 5 different Dugong (including a mother and her calf) but only Christine was tolerant of us. Each day the resident fishermen of Bazaruto Island confirmed Christine's habits and began to help us in spotting her. They had taken on our project too. Indigo Bay Lodge, on Bazaruto, also confirmed Christine's residency. But she is wise and canny and sticks to the unclear water and dives whenever a boat is near.

On the last day, after she had disappeared, we turned our attention to some artisanal fishers as they pulled in their nets. Deep in the archipelago's lagoon and several kilometres from any shores two families of fisher folk worked their nets.

It was an all-family affair. There were two Dhow's, each filled with women, children and men. More women and men were in the water, standing on a low-tide sandbank, hauling in a net of some 200-odd metres. And it took everyone's efforts to bring it in. I counted 12 people initially pulling on the net and as it got closer, everyone joined in the effort. The net bumped and dragged across the shallow seabed trapping everything in its path and mowing the sea-grass to short stubble.

As the net got closer to the boat, several of the men dived in to keep the net's shape so that none of the catch spilled out. It was an arduous task and the net was frightfully empty. When they pulled the net into the boat I saw several Bonito and squid, a baby marbled ray and a remora, as well as a small bucket-load of baitfish. And I remembered that October to December was the closed season for netting.

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Net being dragged across sea grass bed

At the end of our four days, I reviewed my photographs. Christine is a big Dugong – in excess of 200 kilograms. I assume she has figured out to stay away from humans. There are myriad scars on her body – perhaps from nets she has escaped. Dugong hunting has only recently been banned; no mean task because a Dugong is a huge supply of meat for an island family.

It is likely that Dugong hunting still goes on because there are not enough resources to patrol the archipelago

Michael had shown me photographs of a female Dugong that had washed up on the Vilanculos beach. Her breasts were full with milk but her calf was nowhere to be seen. There was no visible cause of death and an autopsy was conducted (she was not pregnant) with "natural causes" being cited as the cause of death.

Of course she could have drowned in a net and been released by the scared fishermen to wash away in the current.

But no-one's talking and we will never know. Nor will we know about her baby.

So, I had found and seen the Dugong. And I had seen for myself the environmental encroachment, illegal and over fishing. I had seen the gill nets and the damage they do as well as the indiscriminate way in which these nets catch everything before it. And I had met and seen all the players in this story of inter-connectedness.

I had my Dugong photographs. The photographs are special, but only to me. No award-winning material and nothing to brag about and definitely not front-page material. But I was not disappointed. Christine had humbled me. She had taught me that wild animals are not there to be exploited by humans, whether as farmers, fishermen, zookeepers, circus owners, or … underwater photographers. Wild animals are exactly that … wild and free, and deserve our respect and love and caring.

The Bazaruto Archipelago is a microcosm of the bigger picture, facing planet Earth. Big business finds resources to exploit and this brings entrepreneurs who find business opportunities. Both offer employment. Both attract job seekers. Beautiful places attract tourists (and photographers). All need food. All impact on the environment. All are connected. Christine and her kin are a small string in a complex web of life and right now humans are straining the web.

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Fisherman diving to keep the net closed

The fisher folk have rights too and it is all too easy to criticise them and their methods. They too need to eat and it is unfair to ban them from fishing or criticise their methods when tourists charter fishing boats to catch game fish off the islands. The Bazaruto Archipelago (and most of the Mozambican coastline) is a Mecca for big game anglers and the message being sent to locals by these anglers exploiting the fish stocks is simply that there's plenty of fish in the ocean.

All of the lodges in the Archipelago have an extensive seafood menu – tourists expect to eat fresh fish when holidaying on the coast and Mozambique is no exception. And the fish, crab, prawns and crayfish seen on the menu is sourced and purchased mainly from local artisanal fishermen. The crab fisherman seen in the photographs accompanying this article earns 2 500 Meticals (local currency) per month. A bag of rice which will feed his family of 5 in a month costs him 1 200 Meticals. So he supplements his income by crabbing every day; selling the crabs to the local lodges. And so the forces of demand and supply play out their game in Vilanculos and the only loser in the game currently is the marine environment

Throughout my travels in Mozambique I have heard countless stories of the exploitation of fishing on the part of local artisanal fishermen. From sharks and mantas and mobulas to reef fish. And I have heard criticism about every method of fishing used by local fishermen. But the local fishermen are only pawns in the game. The Chinese (shark fins and manta gills), the tourist, the expatriates, the anglers and the divers … we are all guilty of exploitation regardless of whether it is the fish we catch, the fish we eat or the roads we drive on in Mozambique. It inflames me to listen to lodge owners, expatriates, anglers and divers criticising the local fishing practices while munching their way through a seafood platter. We are part of the problem … and the solution.

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Post note:

I returned to Vilanculos in January 2011 and saw Christine again. She seemed well and sticking to her old habits. Sadly, in the time between my visits two more dead Dugong were washed up on the Vilanculos beach, one savagely butchered and, its carcass mauled by sharks.

I travelled from Vilanculos to Barra, Morrungulo and Tofu and received reports of Dugong sightings (in particular a mother and calf) along that stretch of coastline.

And in the bar in Aguia Negra in January, a local asked me a question:

"Do you know what's more elusive than a Dugong? ... Dugong poo!"

So, now I am looking for that too. I am told that the lodge owners in Morrungulo have seen Dugong droppings on their beach …

I looked every morning I was there … the story continues and the search for that elusive perfect photograph too.

Dugong Dugon

A few facts

Dugongs and Manatees, also known as sea cows, are endangered species belonging to the scientific Order Sirenia. All four living species are vulnerable to extinction from habitat loss and other negative impacts related to human population growth and coastal development. One species, the Amazon Manatee, lives in fresh water; the other two Manatees are found in the sea as well. The fifth species, the enormous Stellar's sea cow, which lived in the Beiring Straits and weighed over 5 tons, was hunted to extinction a mere 27 years after discovery by Beiring's crew in 1741, showing how vulnerable sirenians can be. They move with an up and down movement of the spine derived from the mammalian gallop as opposed to the side-to-side wave motion of the spine of a swimming fish or running lizard.

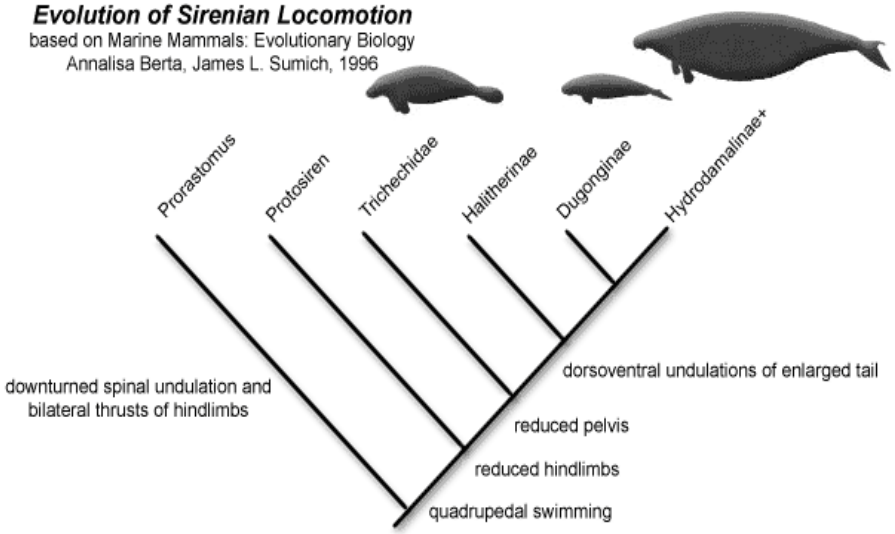
Manatees and dugongs are the only marine mammal herbivores. Unlike the other marine mammals (dolphins, whales, seals, sealions, sea otters, walruses, and polar bears) sirenians only eat seagrasses and other aquatic vegetation. Unlike other marine mammals, sirenians have an extremely low metabolism and zero tolerance for cold water. Their vegetarian diet requires an immensely long gut and a low energy budget. Like dolphins and whales, manatees and dugongs are totally aquatic mammals that never leave the water - not even to give birth. The combination of these factors means that sirenians are restricted to warm shallow coastal waters, estuaries, and rivers, with healthy ecosystems that support large amounts of seagrass and/or other vegetation.

Manatees and dugongs are named after the Sirens of ancient Greek Mythology. In Homer's Odyssey, Sirens were half-woman, half-bird creatures that tried to lure Odysseus and his ship onto their island with sweet songs of love. Later, some authors confused Sirens with mermaids (mythical creatures described as half-woman, half-fish), which eventually led to naming of the scientific Order Sirenia. Early European explorers imaged manatees and dugongs were mermaids, possibly because of their pectoral breasts, dexterous forelimbs, and fish-like tails. In 1493, when Columbus wrote about the "mermaids" he had seen in the Caribbean, he commented that they were not as lovely as he had expected. Indigenous cultures in Africa, Australia, and the Americas each have their own unique creation story about how manatees and dugongs "came to be". Some legends say that manatees and dugongs came from human ancestors who were transformed into sirenians by a curse or other misfortune of living near the water.

The evolution of manatees and dugongs has been well studied despite the limited fossil record, which indicates there were once many more species of sirenians, especially during the Miocene Epoch (5-23 million years ago). Although Sirenian evolution is not fully understood, scientists believe the order originated in the African region during the Eocene Epoch, 50-55 million years ago. The oldest known fossils were found in Jamaica (Prorastomus sirenoides), but scientists suspect that sirenians evolved in the Old World (Eurasia/Africa) and spread around the world's coastlines within a few million years.

Textbooks say that the elephant's closest living cousins are the hyraxes. But recent analysis shows that we must include Dugongs and Manatees in the mix, perhaps even as the closet living relatives of the elephant.

Most fossil records are from the dugong family, even in the Caribbean areas where only manatees are found today. Manatees evolved later, probably in the South American region during the Miocene, with the oldest fossils found in Brazil and Colombia (Sirenotherium pirabensis;



Potamosiren magdalenensis). Scientists do not know for certain what caused the decline of sirenian diversity, but we suspect some combination of climate change, availability of aquatic vegetation, and/or competition with other marine herbivores.

Today, the greatest known threats to manatees and dugongs come from competition for space with human beings. As the human population continues to grow, more and more sirenian habitat is developed for residential, recreational, and commercial use. Human populations are growing the fastest in coastal areas -- in the same places that manatees and dugongs depend on for their survival. As herbivores, sirenians must stay in shallow coastal waters or rivers where vegetation is abundant.

While illegal hunting is still an issue in some areas, development is a greater and more widespread issue. As coastal areas are developed for human use, dredging, wastewater discharge, and sediment run-off negatively impact sirenians habitat. Seagrass beds are destroyed by increased sedimentation. Greater human use of waterways means increased entanglement with fishing gear and increased collisions with boats for sirenians.

Sources: **Sirenian International, Inc**. and The Ancestor's Tale. Richard Dawkins