



A freshly landed species of devil ray, now in high demand in markets for their meat and gill rakers.



A trader cuts through a pile of devil rays.



Rays stacked one upon the other simply goes to show the extent of the population that still remains in our waters.



Rays that were just landed at the fisheries ghat landing site in Cox's Bazar.

PHOTO: NIDHI D'GLORIA COSTA

# The devil rays of Bengal

## On discovering them, trying to find more and some accompanying adventures

**ABIDA RAHMAN CHOWDHURY**

I was mostly lurking behind the group of marine biologists, young researchers, and local parabiologists scouting the dirt-ridden streets of Chattogram just opposite to the under-construction fisheries ghat. We were on a week-long journey together—yours truly taking short notes, and watching wide-eyed as sharks and rays, the size of two humans stacked on top of each other and side by side, were being hauled in, cut up, and processed for later.

This was when a phone call from a fisherman alerted the team of an Oceanic Manta ray (*Mobula birostris*) landing. So huge, that the men could not bring it intact to the landing site or the trader's store. They were going to cut it up right on the boat and all of us rushed to the scene to watch this monstrosity unfold.

The sight that met us was a testament to the existence of devil rays in the waters of Bay of Bengal. This giant aviator of the seas was lying dead end to end on a wooden trawler and six men tossed and turned the ray, to cut it up into pieces. While the sight is sad enough for anyone to turn away their eyes and pretend something like this never happens. It was essentially sights like this that prompted Alifa Bintha Haque, marine biologist and her student Nidhi Gloria D'Costa to take up a mission to uncover the story of the devil rays of Bangladesh.

First, let us get down to the introductions. Devil rays, from the order Myliobatiformes, family Mobulidae and genus: *Mobula*, are among the largest ray species in the world and have awed people for generations. These veritable giants of the sea are amongst the most charismatic groups of cartilaginous fishes coursing and cruising through tropical, subtropical and temperate waters. This includes the waters of Bay of Bengal which in itself is a practical biodiversity hotspot. Time and again experts have opined that the Bengal waters, fed by debris from the largest mangrove forest and sediments from the Ganges delta, also the largest river delta in the world, is one of the most ecologically active and unique ecosystems in the northern Indian Ocean. It offers high nutrient content, high biological productivity and facilitates oceanographic mixing which basically means there is avail-

able food for the planktivore (those who eat planktons) devil rays.

There are nine reported species of devil rays throughout the world but what's saddening is a majority of them are considered 'Threatened' on the International Union for Conservation's Red List. All of them also fall under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II.

While there is not much to rejoice in the world of wildlife conservation and bad news is more prevalent than good, on the micro-scale of things, interesting stuff happens. Stuff that is enough to keep a generation of young people choosing this as a profession even in 2020.

Which is also how I came across this group. Nidhi Gloria D'Costa from North South University, who contributed equally with Alifa Bintha Haque, assistant professor at Department of Zoology of Dhaka University, currently doing her PhD at University of Oxford, in the writing of a journal on devil rays in Bangladesh, that awaits publication in a peer-reviewed journal. The duo were also joined by four former and current students and a current professor of North South University and a student of Department of Zoology at DU.

They went on long adventures by the coast, visiting fisher villages, landing sites, processing centres on the coast of the south-eastern region

pouring rain, over lazy afternoons from June 2018 and 2019. In this time, over the course of their regular visits and near relentless questions, jostling and joking with the locals, they also became fast friends with many people in the area. People who would eventually help them further in their research, are growing to understand the need for conservation for their benefit. In the time they visited these places, the researchers collected (this was left up to chance and opportunity) data on Devil ray landings to support and validate fishers' catch data recorded in the interviews and to create a preliminary species list of devil rays in Bangladesh. You don't have to wait long to look at the buckets of rays being hauled in. From the landed specimens, data would be collected and the species were identified based on a scientific article titled *The Rays of the World project - an explanation of nomenclatural decisions* by Peter R Last and five other authors and a book called *Rays of the World: Supplementary Information* by Peter R Last and G K Yearsley. Regional experts were also consulted.

By the end of the study period, the team had discovered six out of nine available devil ray species in the waters of Bay of Bengal. They are the Pygmy Devil Ray (*Mobula eregodoo*), Shortfin Devil Ray (*Mobula kuhlii*), Devil Fish or Giant Devil Ray (*Mobula mobular*), Chilean Devil Ray (*Mobula tarapacana*), Bentfin



ILLUSTRATION : SUKANYA HASAN



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**M. tarapacana, another species of devil ray which is found in the waters of Bay of Bengal.**

of Bangladesh to collect time-series data to understand the devil ray population still in existence in our waters. This bunch sometimes in groups of two or three conducted two hundred and thirty interviews amongst fishers and traders at fish markets, landing sites, shark processing sites and fishing villages in the



ILLUSTRATION : SUKANYA HASAN

**M. mobular, a species of devil ray found in our waters.**

Devil Ray (*Mobula thurstoni*) and the Giant Oceanic Manta Ray (*Mobula birostris*).

Devil rays are known for their spectacular leaps from the sea when they gather in large groups, but scientists still don't know why they do it. They are also highly evolved elasmobranchs that have left behind life

at the bottom of the sea to swim the water column and near the surface feeding on small fishes and zooplanktons. According to the Manta Trust, mobulidae—manta and devil rays—are born into a life of perpetual motion and can never stop moving as they must keep water flowing over their gills to respire like many other sharks. Their daily and seasonal movements are tuned to the ebb and flow of the ocean currents that breathe life into their world, bearing the planktonic food upon which they depend.

Take for example the Pygmy devil rays, found in our waters, confirmed by landings in the markets in the southern coast of Bangladesh, designed almost as though it is ready to soar into the deep blue sky. It is a small ray that can go up to 1.3m in its disc size. While the devil rays can all look quite similar to the untrained eye, they all have distinguishing features. Such as the

**Shortfin devil ray** which has a short head bearing short fins on the head; a white-tipped fin on the back, and the fins on the side have slightly curved tips and the ray is mostly dark, a rich muddy brown above and white below with a strange out-of-place smiley-face etched permanently to its bottom. **Giant Devil Ray** which is the largest in the genus *Mobula* has also been found from the waters off the coast of Bangladesh. Fishers here have told the researchers of fishing in the seas and watching these rays fly out and enthrall everyone around. Oh and for those of you who are wondering, genus means a class of things that have common characteristics that can be divided into subordinate kinds. The Giant Devil Ray is classified by the IUCN Red List as Endangered, with a decreasing population trend.

As large species which feed low in the food chain, these animals can be thought of as indicator species for

the overall health of the ecosystem. **Chilean devil ray** or Box ray can go up to 3.7 meters in width and are also quite huge. A recent surge in demand for mobula ray products internationally and increased direct fishing in key range states suggests an escalating threat to these species. The Box Ray or Chilean Devil Ray is classified by the IUCN Red List as Data Deficient, with the South East Asian population considered Vulnerable, according to Memorandum of Understanding on the Conservation of Migratory Sharks.

When it comes to Bentfin devil rays, it seems nature wanted to be dazzle a little. The Manta Trust says they have a distinctive double curvature on the front portion of the fins on their side, while the undersides of these fins are coloured beautiful iridescent silver or gold. I have left the Giant Oceanic Manta Ray to be described last, because, and excuse me for this, is the piece de resistance when it comes to encounters with these gentle, very acrobatic, and mad-gorgeous aviators/gliders of the sea.

The Oceanic Manta Ray is the largest ray species in the world with a disc width up to 7m in extremely large specimens. With a lifespan of nearly forty years, the species at its highest can weigh up to 2,000kgs.

They first appeared in the fossil record around 28 million years ago. They have glided through the oceans for millennia and happen to call the waters off our coast home as well. At least six of them do. And further research and scientific discoveries could guide the way forward in conserving these animals.

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All of the data and findings of this project will be part of a scientific article on fishing and trade of devil rays in the Bay of Bengal, which has been accepted to be published to the *Aquatic Conservation: Marine and Freshwater Ecosystems* which is an international journal dedicated to publishing original papers that relate specifically to the conservation of freshwater, brackish or marine habitats and encouraging work that spans these ecosystems.

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Fishing nets being sorted, repaired and dried.