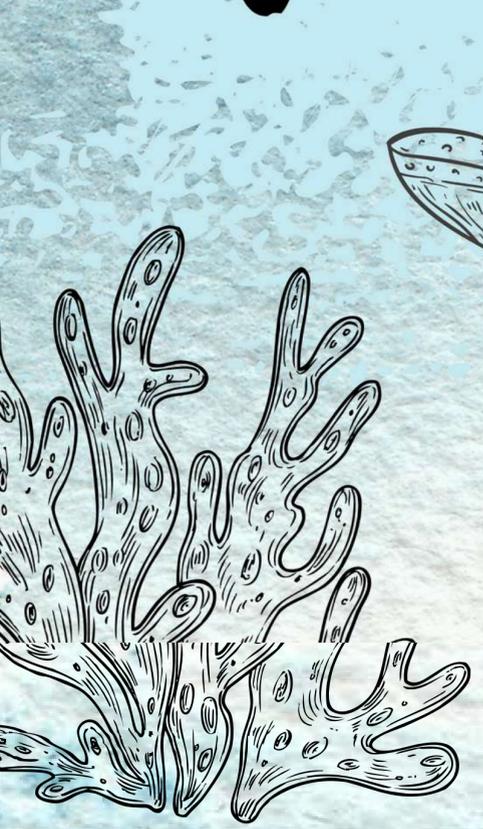
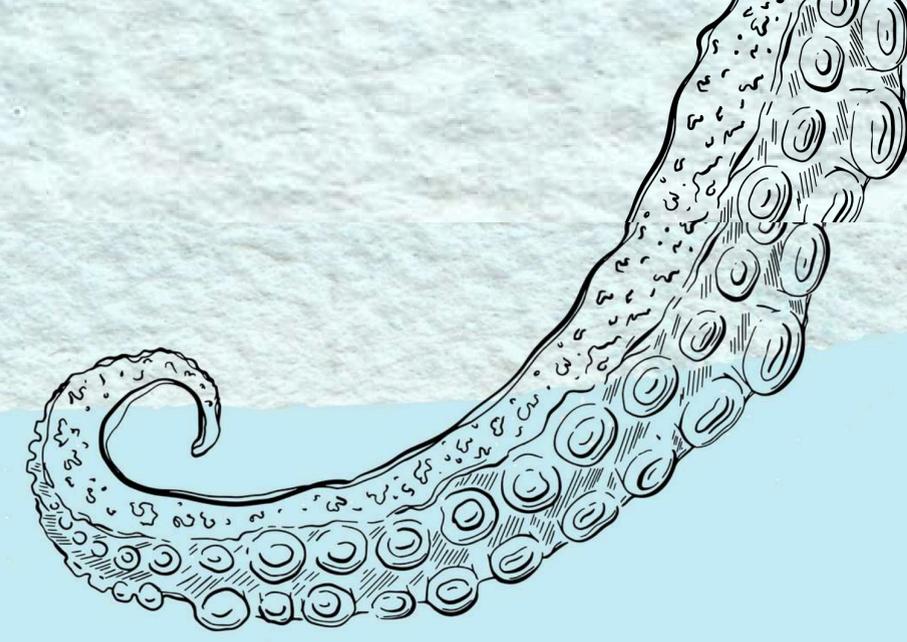
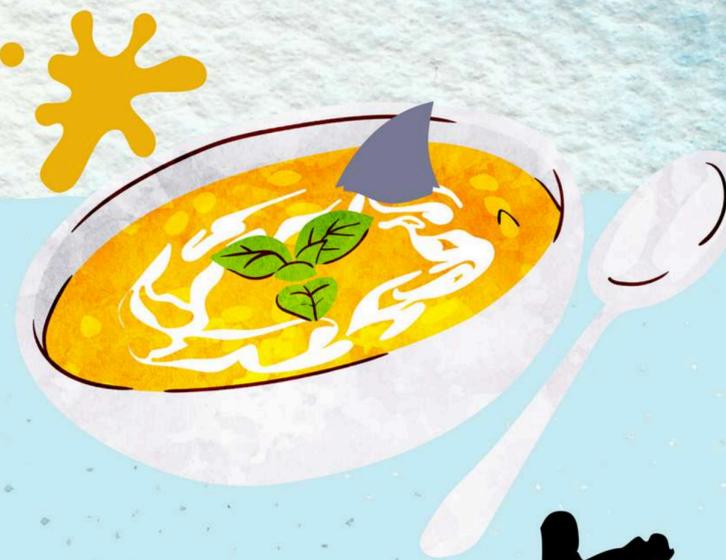


May 2024

not just soup

shark stories,
turtle tales
& more...

Issue 5



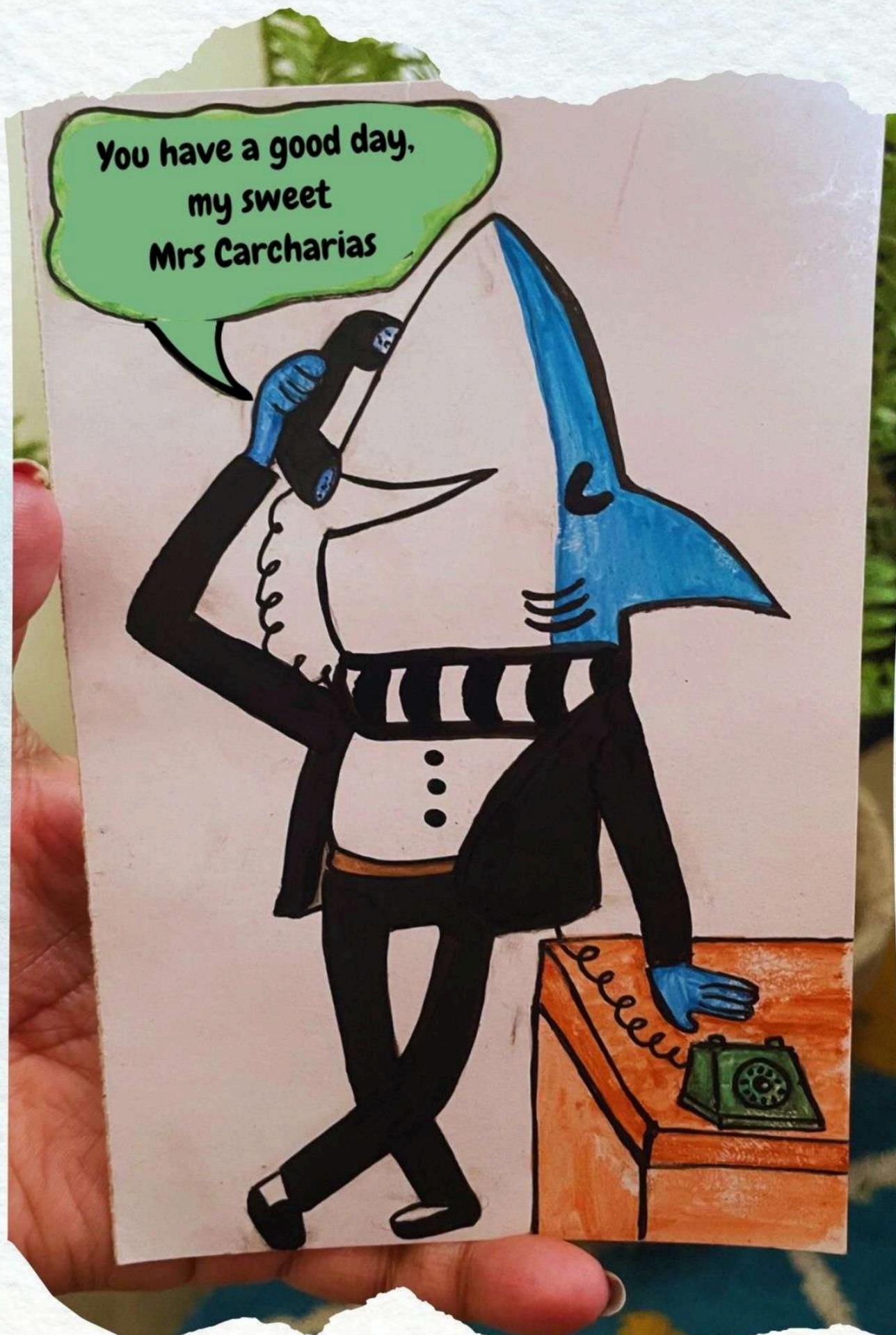
Dear Reader,

Do you know that feeling when you close your eyes, turn on the music and the *katzenjammer* of the world fades away? EDM or country rock, Sufi or jazz, music has an instantaneous effect on our moods. It is a form of communication transcending space and time, for it speaks directly to our soul. I just finished listening to an entire playlist of the wildest, most raw yet ethereal and strangely calming noises - whalesong. And the goosebumps refuse to go away...

Whales, as we know, have appeared long before humans in the evolutionary history of Earth, and have been using a mixture of (*what sounds to human ears like*) police sirens, grunts, moans, and whistles to communicate under the deep dark oceans. Western science has scoffed at indigenous knowledge and anthropomorphism of animals for the longest time but today, scientists are busy trying to interweave strands of local and traditional knowledge (*ages old*) and scientific discoveries (*not ages old*) to have a holistic understanding of the non-human world. Today we may still be trying to decipher whalesong through technology, but our ancestors had figured out ways to understand animal behaviour and communication in a world where science was still trying to find its footing. The Iñupiat (*the indigenous subarctic peoples of the Arctic*) still believe that humans and whales can talk and share a reciprocal relationship far beyond that of predator and prey. The Makah and Nuuchahnulth whalers of Washington's Olympic Peninsula and British Columbia's Vancouver Island observe eight months of rituals meant to communicate respect in the mysterious language of whales.

I wonder if we were to fully grasp whalesong or any other form of animal communication in the oceans, would that change our relationship with marine animals? Would these forms of communication be included in our school curriculum? Would we seek to conquer marine flagship species and set up 21st-century Atlantis? Ah, some questions best remain unanswered.

But do not despair, for this issue stars a whole bunch of sassy whales and sharks, trying to blend in science and ethnoscience with a sprinkle of humour and a dash of sea salt. So, catch your favourite tune and dive right in...

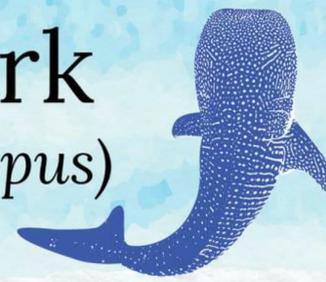


*“Praise Poseidon, whales and sharks don’t live on land
Can you imagine them lumbering across the sand?
Some hobnobbing to start a revolution of their own...
Some whispering sweet nothings over the phone.”*

~Debangini

Know Your Shark

Whale Shark (*Rhincodon typus*)



The whale shark is not only the world's largest living shark but also the largest fish in the sea, growing up to 40 feet and weighing up to 30 tonnes. This gentle giant has a widespread distribution, and occurs in all tropical and warm temperate seas, except in the Mediterranean.

In contrast to most sharks from the same order (Orectolobiformes) which are benthic (bottom-dwelling) species, the whale shark is a pelagic (surface-dwelling) species, which means it is often seen entering lagoons or coral atolls! While highly migratory, it also shows site fidelity, often returning to the same feeding site.

Whale sharks have an enormous menu to choose from though they have a soft spot for plankton. They filter-feed, swimming with their colossal mouths gaping open to scoop up tiny plants and animals, along with any small fish that happen to be around, from fish eggs to crustaceans, to occasional larger prey like squid or tuna. Although massive, whale sharks are pretty gentle and sometimes even allow swimmers to hitch a ride. They are considered harmless to humans and often have docile interactions with divers. Declared Endangered by the IUCN and listed in Appendix II of CITES, they are targeted by illegal, Unregulated and Unreported (IUU) fisheries for their fins, oil and meat even today.

Sources:

1. Whale Shark. (2010). National Geographic. <https://www.nationalgeographic.com/animals/fish/facts/whale-shark?loggedin=true&rnd=1713766163812>
2. Whale Shark. (n.d.). EDGE of Existence. <https://www.edgeofexistence.org/species/whale-shark/>



Researcher's Isle

Meet Garima Bora



Tell us about your current work.

Currently, I'm working on an elasmobranch bycatch monitoring project located in Malvan, Maharashtra. My core fieldwork involves conducting fisheries-independent and recently initiated fisheries-dependent surveys within estuarine areas. So, a typical workday begins at dawn and continues until sunset, particularly during landing centre surveys. My tasks encompass conducting visual documentation, taking precise measurements, conversing with local fisherfolk to understand their catch, and diligently entering collected data. Additionally, during boat and beach surveys, our efforts persist from dusk till late into the night, allowing for a comprehensive habitat exploration. While elasmobranch species are the primary focus of the surveys conducted by our team, we've also serendipitously encountered a diverse array of non-elasmobranch species, such as the dog-faced water snake, smooth-coated otters, remoras, mud crabs, and more. There's always something interesting approaching our boat!

What has your journey been like till this point?

Though my journey has been brief, it has been filled with its fair share of highs and lows. I've gained valuable lessons that have positively impacted both my professional and personal life through these experiences. Specifically, I've learnt the importance of resilience in overcoming challenges and the value of collaboration and continuous learning for professional growth. I'm deeply grateful for the opportunities I've been entrusted with and for the unwavering support of my family, advisors and colleagues.

What are some of the challenges you have faced along the way or continue to face?

The primary challenge I've encountered revolves around the feeling of imposter syndrome, which might be common among early-career researchers. There's often a persistent sense that what you're doing isn't "enough" or isn't ecologically relevant. Over time, however, you begin to realise the significance of your work and how it is just as important as projects undertaken by others in your field. It's a process of learning to justify and value your contributions, recognising their importance and relevance within the broader context of conservation research.

Advice you would want to give to those who want a career in marine research and conservation...

I think it's crucial to never compare your journey with that of others. Each person has their unique path, with opportunities awaiting at different points. While some may reach their goals quickly, for others, it may take longer. Stay curious and continue reaching out to individuals you're interested in collaborating with!



You can email Garima at garimabora99@gmail.com or find her on Instagram @_garimabora_



Pearls of Fishdom

Song of the Sirens

Whale songs and their musical journeys



SONG OF THE SIREN

1.57

-0.34



Described as eerie, fascinating and sometimes unnerving, whale songs are one of the most mysterious sounds to have been heard reverberating through the ocean, and have been a topic of discussion since sailors first began navigating the high seas. Legends believed the haunting sounds from the deep were linked to mythical elements, often thought to be the ghosts of drowned sailors calling out to fellow seamen. Only in 1967 when American biologist Roger Payne and fellow researcher, Scott McVay, identified the sounds recorded by a US Navy hydrophone as a humpback whale song, the journey of whale song exploration truly began and continues to be one of the most intriguing topics in zoomusicology today.

Whale “songs” (*the regular pattern of sounds that some species of whales make*) are the primary means of communication whales have in the dark oceans to find one other and, eventually, mate. Over the years, scientists have made mindboggling and intriguing discoveries that have linked whale vocalisation patterns to not just their migratory, mating and feeding behaviour but also to novel learning and cultural evolution!

According to a **new study**, **baleen whales** use a larynx (*or voice box*) in their throat to “sing”! A baleen whale’s larynx is shaped differently from other mammals and also apparently has a fatty cushion that vibrates when air is pushed out from the lungs, allowing the whales to create low-frequency sounds underwater to communicate over large distances.

Blue whale songs fall below the range of human hearing. So, if you want to properly listen to one, with its outworldly wobbly pulses and haunting moans, science says you have to speed it up by at least two-fold. Two decades back, a pair of physicists turned whale researchers, John Hildebrand and Mark McDonald got their hands on some of the earliest known recordings, created by the Navy in the 1960s and stored on analogue cassettes. Fascinatingly, they discovered that each population of blue whales from the Antarctic and the Central Pacific sings a different song! They also found that the frequencies of blue whale songs had declined by 30% over 40 years.

Are blue whales alone in their magical journey to become Tim Storms of the marine world, or are more whales part of this musical (r)evolution?

Well, we now know that pacific humpback whales once thought to be a discrete population, actually mix and mingle far more than previously believed. Evidence? Their songs! Recently, some scientists, using hydrophones suspended from radio-linked buoys and small boats, have recorded a unique and radical change in **humpback whales'** song in the Pacific Ocean off the Australian east coast. Their song was replaced by the song of the Australian west coast population from the Indian Ocean, in what can only be termed as an example of cultural evolution, whereby changes in songs are passed among individuals by learning and accumulate over time.

The rapid and complete replacement of a complex song over less than two years is revolutionary rather than evolutionary and suggests that novelty drives changes in humpback whale songs. But another 2021 study questions, if this is instead an epiphenomenon. This is based on the realisation that the song dynamics suggest that singing humpback whales may be modulating song features in response to local conditions and genetic predispositions rather than socially learning novel sound patterns by copying other singers.

Either way, these giganormous bass musicians seem to be all set to take the underwater music world by storm with their latest hits (*hang on tight to your steering wheels, human sailors*)!

~Debangini

Sources:

- French, K. (2022). *The Mystery of the Blue Whale Songs*. Nautilus. Available at <https://nautil.us/the-mystery-of-the-blue-whale-songs-248099/>
- Noad, M., Cato, D., & Bryden, M. (2000). Cultural revolution in whale songs. *Nature*, 408(537), 537. <https://doi.org/10.1038/35046199>
- Mercado, E. (2021). Song Morphing by Humpback Whales: Cultural or Epiphenomenal? *Frontiers in Psychology*, 11. 10.3389/fpsyg.2020.574403

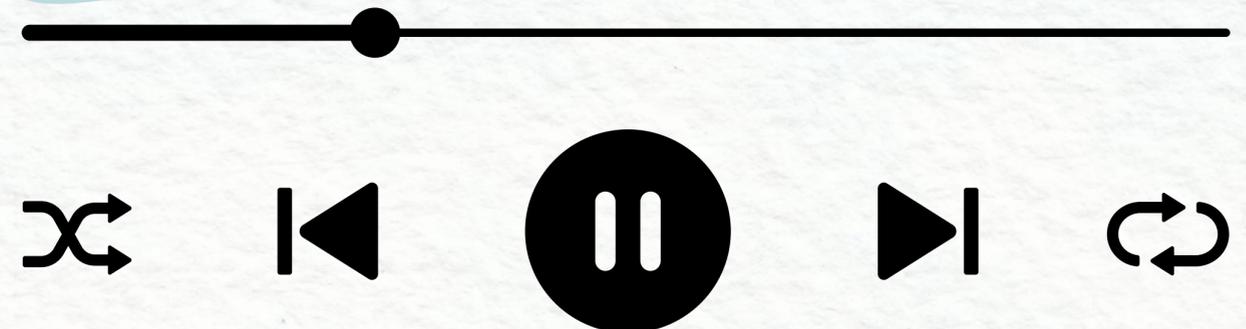
The National Oceanic and Atmospheric Administration (NOAA) has been recording underwater whale vocalisations using high-frequency acoustic recordings across a dozen different sites in the Pacific Ocean since 2005. They now possess over 170,000 hours of audio recordings, equivalent to about 19 years of audio data. Identifying an opportunity to apply machine learning to the plethora of whale song data, Google hatched a plan to train an artificial intelligence model to visualise the audio on a vast scale.

It took six months before **Pattern Radio: Whale Songs** was ready for the public eye (*and ears*). The website acts as a tool to visualise whale audio recordings on a larger scale through spectrograms and, thanks to AI, it is easy for anyone to explore and discover whale songs. The data presented on the website will hopefully help scientists better understand whales' behavioural and migratory patterns, ultimately leading to better protection for the species.

Source: **Pattern Radio: Whale Songs**



Watch Annie Lewandowski's installation performance, "**Siren- Listening to Another Species on Earth**," which incorporates a 40-minute selection of humpback whale songs she recorded with Katy Payne in Hawaii in 2019.





“Don’t know about me but
the puns are evolving...”

What is a shark’s
favourite cheat
meal?



They probably find it hard to choose between ‘Fish and Ships’
and ‘Peanut butter and Jellyfish sandwich’.

One evening, Mr Great White goes to a bar drunk with sharkasm and tells a great white lie...

I would like to order some seagrass salad, please!

???

He puzzled a lot of seatizens that night, including his usual main course- Mr Lobsy the bartender

(technically his 333rd replacement)





SEAmbiosis

The Odd Couple: Boxer Crab and Sea Anemone



Out of all the odd and controversial couples out there under the sea (kelp diggers and freeloaders included), the most astounding one is arguably the boxer crab and sea anemone.

Sea anemones are brightly coloured cnidarians with simple digestive systems and a single body cavity surrounded by tentacles covered in stinging cells. These cells act as a defensive mechanism and assist in the capturing of prey. Boxer crabs wield these sea anemones attached to their claws, and when directly threatened, the crab will utilise the sea anemone in a forward, 'punching' movement towards the aggressor. The anemone benefits from the relationship by being protected by the swift-moving crab, and getting free rides across the ocean floor directly to food sources (normally most sea anemones don't have the luxury of moving around by themselves). Because they quite resemble cheerleaders waving pom poms, boxer crabs are also known as pom pom crabs and cheerleaders!

Is it a healthy relationship?

Who are we to judge...

Is there co-dependency?

Damn right, there is!

You see, boxer crabs are the only known crab species to have effectively lost all ability to use their claws in typical fashion, having formed what appears to be an obligate dependence on the anemones held in their claws!

Further reading: Researchers have identified the first known example of a boxer crab stimulating a sea anemone, to reproduce asexually. Read the [paper here](#). Why are relationships in the marine world so delightfully bizarre?

Source: Schnytzer, Y., Achituv, Y., Fiedler, G. C., & Karplus, I. (2022). *The Intimate Relationship Between Boxer Crabs And Sea Anemones: What Is Known And What Is Not*. *Oceanography and Marine Biology: An Annual Review*, 2022, 60, 495-532

Straight from the field



Ganjam Diaries



Image: Vidisha M.K

Riddling Ridley's: Nighttime Wonders at Ganjam

~ Vidisha M.K

Heading to the beach in the middle of the night, walking nearly six kilometres with the hope of seeing nesting olive ridley turtles had become a routine. It had been over a week without any sightings. Various factors like wind, moon phase, or other reasons seemed to prevent the turtles from arriving to nest on the beach. We often encountered false crawls and every morning, we would return to our field station feeling disheartened after tirelessly scouring the beach.

Then one night we saw fresh tracks and followed them hoping to see a nesting turtle - disappointing news struck again. Wild boars had already ransacked and devoured the nest, as evidenced by their hoof prints surrounding it!

Our minds were troubled about salvaging this season at this point. As sunlight started peeking over the horizon at dawn casting amber light that shimmered across the sea, something caught our attention in the distance: dogs and crows gathered around something on the ground with sand being thrown about—the excitement resurfaced as we realised it was indeed a turtle! We felt a sense of relief and delight.

We chased the dogs away to make sure they did not disturb her, while cautiously approaching to not scare her off. She dug her nest and laid eggs in merely twenty-five minutes before adeptly securing it with her "tap dance" moves like an expert. Completing final touches took an additional twenty minutes before she waddled back towards the sea along the shoreline. While this was happening, I sat at a distance and sketched the event.

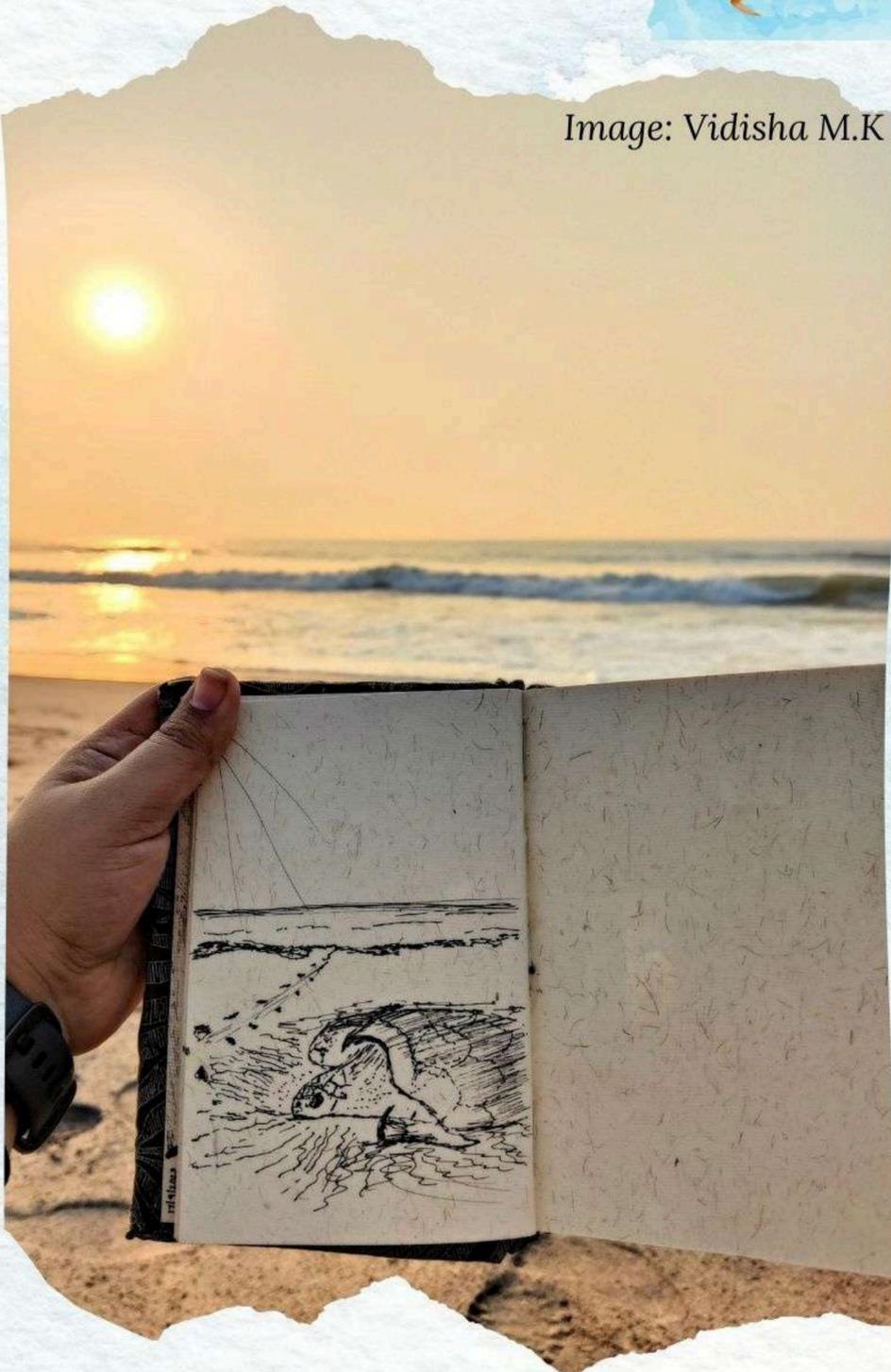




Image: Rahul MS

A Feathered Visitor at Night

~Rahul MS

One night, as I was walking towards our hatchery to check if any sea turtle hatchlings had hatched, I noticed a pair of shining eyes on one of the poles. I immediately assumed it belonged to an owl, and went for a closer inspection. It was a beautiful adult barn owl perched on the pole, most likely out to hunt and on the lookout for prey. This was the first time I had seen an owl at night near the hatchery! I think this may also be one of the examples of pressure that predators from the sky (as well as from the ground) pose to artificial hatcheries, and highlights the importance of protecting artificial nests from predators.

Slithering by the Beach

~Bipro Behera

As I was walking on the beach one morning, I caught a sudden movement in the sand. It was a beautiful yellow sea snake (*Hydrophis spiralis*), looking directly at me, its head and top portion of its slender body raised above the sand in what looked like a defensive stance. Its tongue was flickering and it was also making a hissing sound. I realised I had accidentally gone too close to it and immediately backed away, a little scared. This was the first time I had such a close look at this beautiful snake. From a safe distance, I managed to click some photos and a video. It eventually slithered away near the surface of the water.



Image: Bipro Behera



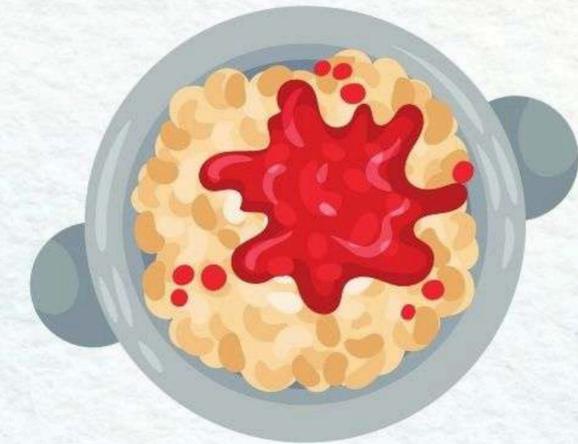
From the Galley

Sudado de Raya



Sudado de Raya (an ancient Peruvian dish of ray meat)- excerpts from a paper by Bradley (2012):

Rays, like most fish, should be cleaned as soon as possible after they have been caught. First, cut off and discard the tail, then turn the ray over so the belly is upright. Make an incision in the centre of the belly, starting between the gills and cutting from the mouth to the tail. Pull out and throw away the internal organs and rinse the body cavity thoroughly with water, washing away all the blood. Cut the ray into servings; about six to eight if it's a small (one- to three-pound) ray. In sudado de raya, the entire fish (sans tail and internal organs) is used. Small bones, dealing with which can be an irritant for the seafood lover, are mostly absent from sudado de raya: as members of the shark family rays have skeletons composed of cartilage.



How to eat

If you are making the modern version of sudado de raya, heat garlic and oil in a large pot. Now add strips of ají amarillo and tomatoes to the pot. After the oil and vegetables are heated, add the pieces of ray and cook over high heat until the meat is seared. Pour in chicha and turn down the heat a bit. The correct amount of chicha depends on the cook and the quality of the available chicha; I like to use about a cup of aged chicha de jora. After about thirty minutes, add a handful of the rinsed edible seaweed mococho and, if you have them, any number of Peruvian seafood delights such as the small purple North Coast crabs, giant mussels, sea snails, and conchitas saladas (cockles). Taste and add salt if necessary. Like many platos típicos of northern Peru, sudado de rayo is served with rice.



Source: Sudado de Raya: An Ancient Peruvian Dish. Available from:
https://www.researchgate.net/publication/259728519_Sudado_de_Raya_An_Ancient_Peruvian_Dish.



Sea Board



ISTS42, Thailand

Our researchers from the Marine Flagships team, Adhith Swaminathan, Chandana Pusapati and Hariprasath R attended the 42nd International Sea Turtle Symposium (ISTS42). This six-day global conference was hosted in Pattaya, Thailand from the 24th to the 29th of March, 2024.

Since 1981, the International Sea Turtle Society, a community of sea turtle biologists, conservationists, educators, and advocates, has gathered to share knowledge, build capacity, network, collaborate and ultimately, leverage conservation. The ISTS42 had an exciting lineup of workshops, plenaries, student talks, poster presentations and speed chatting with experts. The symposium, being held in Asia after many years, was a great opportunity for students and researchers in the region to network with the global sea turtle community. It also allowed the sea turtle biologists and conservationists in India and the neighbouring countries to present their work, discuss the conservation and management of regional populations and foster collaborations.



Images: Adhith Swaminathan, Hariprasath R and Chandana Pusapati

At the conference, Chandana and Hariprasath delivered talks on Dakshin Foundation's work on olive ridley sea turtles in Odisha and green turtles in Lakshadweep respectively, and Adhith Swaminathan presented a poster on leatherback sea turtles in Andaman and Nicobar Islands.



Images: Adhith Swaminathan, Hariprasath R and Chandana Pusapati

INTERNATIONAL SEA TURTLE SYMPOSIUM 2024 Pattaya, Thailand

42nd International Sea Turtle Symposium

Meet our Keynote Speakers



Jeff Seminoff
National Marine Fisheries Service
Southwest Fisheries Science
Center, La Jolla California, USA



Jarina Mohd Jani
Faculty of Science and
Marine Environment
Universiti Malaysia
Terengganu

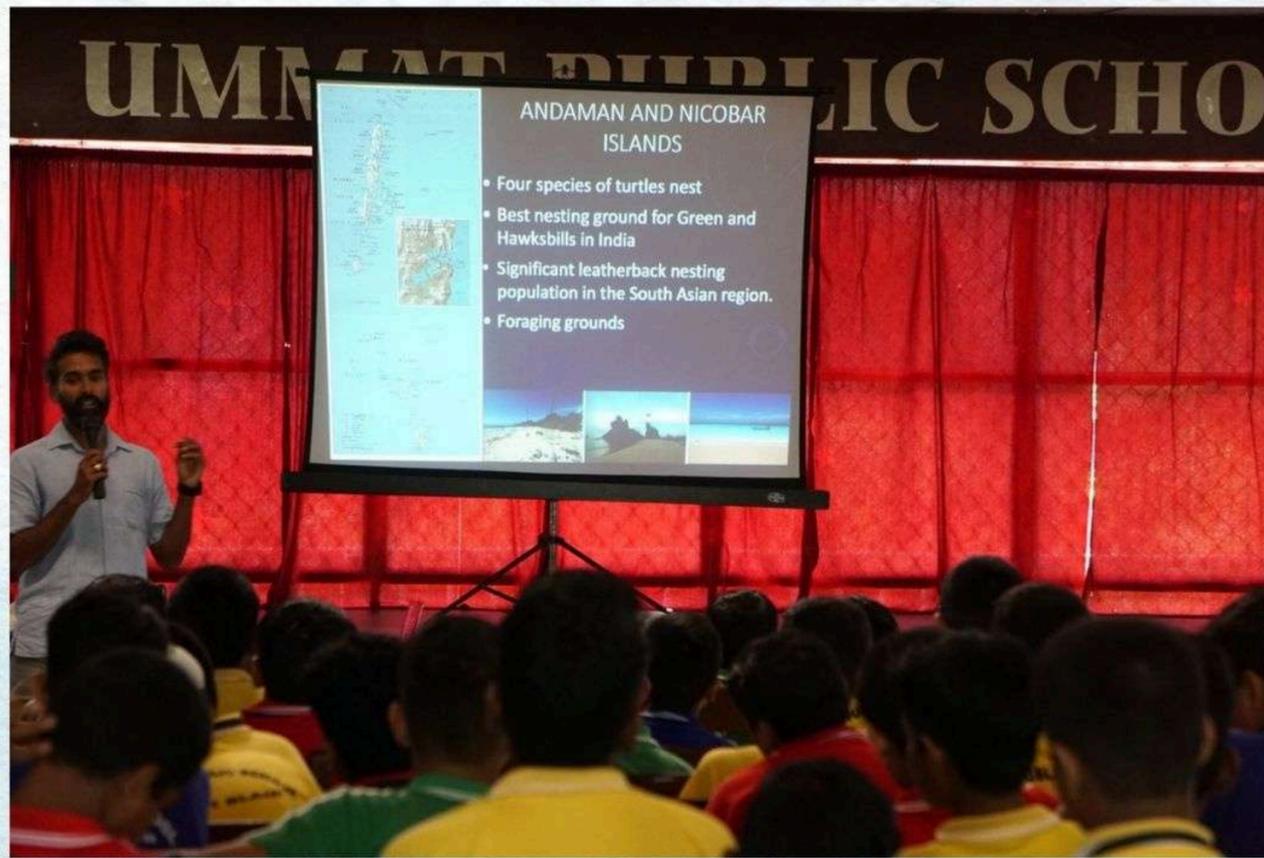


Kartik Shanker
Centre for Ecological Sciences
Indian Institute of Science,
Bangalore, India

Our Programme Head, Dr Kartik Shanker, was invited as one of the keynote speakers at the symposium. His talk was titled 'The Brighter Horizon: Balancing Human Needs and Ecosystem Health in Marine Conservation.'

With his co-organisers Jarina Jani, Hector Barrios-Garrido and Bryan Wallace, Kartik also conducted a workshop on 'Decolonising Sea Turtle Conservation: Walking the Talk' at the symposium.

Image: International Sea Turtle Society



Outreach in the Andamans

In the Andamans, our Programme Officer Adhith Swaminathan and Programme Assistant K. Irfan Ali from the Marine Flagships team started the outreach sessions for this year (February-April) in the South Andaman region at four schools- Ummat Public School, Port Blair, Ananda Marga School, Junglighat, Govt. Middle School, Wandoor and Govt. Senior Secondary School, Tusnabad, where almost 200 students participated. The outreach sessions included a presentation on the biology and ecology of sea turtles with a special focus on the leatherback of Andaman and Nicobar Islands and a short documentary of Dakshin's long-term monitoring project on leatherbacks in Little Andaman Island. They received an encouragingly positive response from the students during the sessions.



They also conducted their first outreach session for college students in the Jawaharlal Nehru Rajkeeya Mahavidyalaya, where 72 students from the Zoology Department participated. News about this event was broadcast by the Air Akashvani Port Blair, a radio station in Port Blair.

Recently in April, the team conducted a few more outreach programmes in five government schools in Dollygunj, Port Blair, School Line, Ferrargunj and Manglutan which witnessed a total participation of 400 students. Most recently, they interacted with around 200 students program at St. Xavier School, Mannarghat and will continue to conduct such outreach sessions in the South Andaman region, until the schools shut for their summer vacation at the end of April.



APOWA Workshop, Odisha

On the 5th of February, 2024, a one-day workshop titled “Technical training of turtle guards and volunteers for in-situ and ex-situ protection of sea turtles” was organised at Konark by Action for Protection of Wild Animals (APOWA), a grassroots NGO. It was conducted by researchers from the Marine Flagships programme, Vishrutha Rao and Rahul MS, along with our field staff, Mahendra Nayak. The session discussed general concepts of marine turtle biology and reproduction, field protocols for monitoring activities including protocols for night patrolling, nest relocation, hatchery management, hatchlings release, data collection and analysis. This was followed by a practical session conducted at Chandrabhaga Beach, where the participants were trained in identifying nests, relocating nests to the hatchery, and artificial nest construction.



Images: Rahul MS and Mahendra Nayak



Sports Day 2024, Ganjam

On the 17th of March 2024, the Community Wellbeing and Environment (CWE) team organised a Sports Day event near the new Podampeta village. School kids from Podampeta, Nuagaon and Purnabandha villages took part in an Ultimate Frisbee tournament. As part of the event, the Marine Flagships team set up a stall with fun and interactive games for the children, including a memory card game on local marine species and a maze game on hatchlings finding their way to the sea. The event witnessed good engagement and participation from the local children who enthusiastically lined up to play the games, often returning for multiple rounds of fun. The interest from the kids underscores the need for community engagement and environmental awareness programmes.

Outreach in Malvan

Dakshin Foundation participated in the two-day "Kaasav Mahotsava" held on the 24th and 25th of February 2024, organised by the Sawantwadi Forest Division, Mangrove Cell, Maharashtra Forest Department on the Wayangani Beach. This festival aims at raising awareness about the ecological importance of turtles and highlighting the crucial role local communities play in their conservation. This platform not only served as a stage to introduce Dakshin Foundation to the public but also facilitated discussions on ongoing conservation initiatives across various sites. The team distributed outreach materials ranging from sea turtle t-shirts to children's books such as Moonlight in the Sea by Kartik Shanker in English and Marathi and infographic posters on sharks and rays of Malvan.





Outreach in Lakshadweep

Our Senior Programme Associate Hariprasath R and Programme Assistant Mohammed Serfas Khan A K conducted an interactive session with the students of Govt. Senior Secondary School in Agatti Island to raise awareness about marine ecology in the Lakshadweep Islands. They also organised an outreach event with Mahaboob Khan from the Sustainable Fisheries team, at the Tourism Department of University College in Kadmat, where they led interesting discussions with the students about the key principles of ecotourism.

Dakshin Foundation is also conducting research in the Lakshadweep Islands to track the movement of green sea turtles. A key aspect of the project involves tracking individual turtles through photo identification. To facilitate this, the team is actively engaging with the local dive communities of Lakshadweep, encouraging them to contribute photos of turtles taken during dives. A comprehensive poster featuring Dakshin's photo-identification study of green sea turtles, outlining how to take suitable photos and where to submit them, is being distributed to local dive clubs in Agatti and Kadmat to foster participation in scientific research.



Images: Mohammed Serfas Khan A K

Other Updates:

Our Program Assistant, Reeflog, Samar Ahmed, was invited for an interview by Amy Dkhar and Tanya Tiwari from the Nature Conservation Foundation (NCF) on International Women's Day. You can read the [interview here](#), published in Amar Ujala, Delhi Edition.

Calendar Launch

The Marine Flagships team created and launched a 2024 calendar, to showcase photography by our field assistant Bipro Behera.

Bipro hails from a fishing village in Ganjam, Odisha and works with us on the long-term monitoring of olive ridley turtles at Rushikulya. He was inspired to work on turtles by his father, the late Damburu Behera, who was instrumental in the discovery of mass nesting at this beach. Bipro is a skilled turtle walker who can effortlessly identify turtle tracks, locate nests, and relocate them to the hatchery. Through the project, he and his colleague Mahendra Nayak have been monitoring the mass nesting beach every night during the nesting season for the last 15 years.



This calendar is an ode to Bipro's talent and love of photography. You can follow him on Instagram [@bipro_seas](#).

[Click to download the calendar](#)

Sharks & Rays of India



Banner Design: Debangini

Sharks and Rays of India

Website Launch

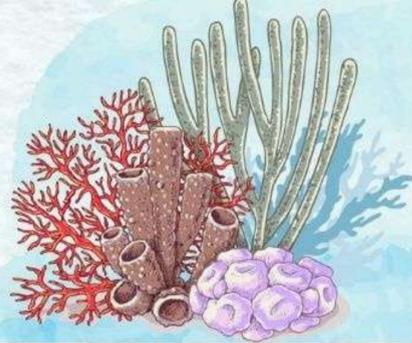


Welcome to the world of Sharks & Rays

From shallow coastal habitats to deeper offshore waters, India's marine ecosystems are home to a wide variety of sharks and rays. An impressive array of species from the oceanic whitetip shark to nearshore carpet sharks inhabit India's marine realms. These species contribute to the intricate balance of marine ecosystems.

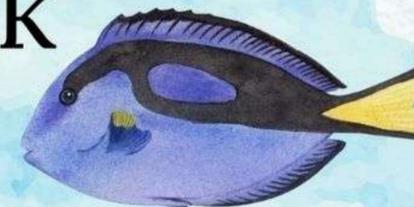
We invite you to explore the big beautiful seaverse of marine gentle giants- the elasmobranchs, on our new Sharks & Rays of India website. We hope that it will foster an appreciation for these animals and the vital role they play in our oceans. You can find out more about various shark and batoid species found in Indian waters, particularly their distributions, as our website is a compilation of data from landing centre surveys and scientific literature from around India.

Dive into the website and sign up to stay in the loop about news and updates from the world of sharks & rays.



Reef Logbook

Are you a diver?



Diver Name: _____

Location: _____

Dive 1

Dive 2

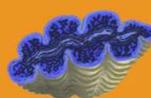
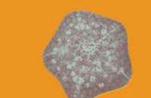
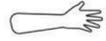


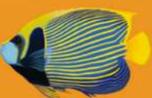
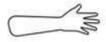
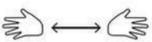
Upload Your Data



| Dive Log | | Dive Site Info | |
|---|--------------------------------|--------------------------|--|
| Date & Time: | | Dive Site: | Primary Substrate: |
| Total Dive Time: | | Habitat: | <input type="checkbox"/> Natural <input type="checkbox"/> Artificial <input type="checkbox"/> Coral <input type="checkbox"/> Metal <input type="checkbox"/> Seagrass <input type="checkbox"/> Concrete <input type="checkbox"/> Sand <input type="checkbox"/> Wood <input type="checkbox"/> Rock |
| Maximum Depth(m): | | Temperature: _____ | |
| Average Depth(m): | | Currents: _____ | |
| | | Visibility: _____ | |
| Rare Species (Note Specific Type And Number) | | Dive Site Info | |
| 1. Sharks | | Dive Site: | Primary Substrate: |
| 2. Rays | | Habitat: | <input type="checkbox"/> Natural <input type="checkbox"/> Artificial <input type="checkbox"/> Coral <input type="checkbox"/> Metal <input type="checkbox"/> Seagrass <input type="checkbox"/> Concrete <input type="checkbox"/> Sand <input type="checkbox"/> Wood <input type="checkbox"/> Rock |
| 3. Sea Snakes | | Temperature: _____ | |
| 4. Marine Mammals | | Currents: _____ | |
| 5. Sea Turtles | | Visibility: _____ | |
| Behavioural Associations (Note Dominant Fish Species And Size) | | Mixed Predator Groups | |
| Shoaling Groups | Parrotfish and Surgeonfish | Large Trevallies | <input type="checkbox"/> 0 - 10 <input type="checkbox"/> 11 - 50 <input type="checkbox"/> 51 - 100 <input type="checkbox"/> >100 |
| | Goatfish and Wrasses | Barracuda | <input type="checkbox"/> 0 - 10 <input type="checkbox"/> 11 - 50 <input type="checkbox"/> 51 - 100 <input type="checkbox"/> >100 |
| | Trevally and Emperor | Other Notes and Comments | |
| | | | |

Slates designed for the Andaman Islands

| | | | | | |
|---|---|--|---|---|---|
|  Trochus Snail |  Magnificent Anemone |  Spider Conch |  Giant Clam |  Mushroom Coral |  Cushion Seastar |
| | | | | | |
| | | | | | |
|  Spiny Lobster |  Sea Urchin |  Crown of Thorns |  Pineapple Sea Cucumber |  Octopus |  Barrel Sponge |
| | | | | | |
| | | | | | |
| Guide To Average Fish Size Category 0-25 cm  25-30 cm  30-100 cm  >100 cm  <input type="checkbox"/> Dive 1 <input type="checkbox"/> Dive 2 | | | | | |

| | | | | | |
|---|---|---|---|---|--|
|  Meyer's Butterflyfish |  Virgate Rabbitfish |  Striped Surgeonfish |  Elegant Unicornfish |  Emperor Angelfish |  Moustache Triggerfish |
| | | | | | |
| | | | | | |
|  Red Snapper/ Twinspot |  Bicolor Parrotfish |  Leopard Coral Grouper |  Any Grouper >100cm Total Length |  Bumphead Parrotfish |  Napoleon Wrasse |
| | | | | | |
| | | | | | |
| Guide To Average Fish Size Category 0-25 cm  25-30 cm  30-100 cm  >100 cm  <input type="checkbox"/> Dive 1 <input type="checkbox"/> Dive 2 | | | | | |

By actively involving certified recreational SCUBA divers, ReefLog gathers essential data on reef species across India's diverse marine landscapes, contributing significantly to monitoring reef health.

Equipped with specially designed ReefLog underwater data collection slates, participants will now embark on their underwater journeys with knowledge and enthusiasm. These slates feature illustrations of twelve fish and invertebrate species from each region along India's coastline, carefully selected for their ecological importance and ease of identification. With one side of the slate dedicated to recording the presence and abundance of observed species and the other side allowing for detailed logging of dive specifics and environmental conditions, divers can capture every detail of their underwater encounters. The slates also feature a dedicated section for documenting mixed-species foraging aggregations, offering insights into fascinating behavioural dynamics beneath the waves.

Once the ReefLog survey dives are complete, the data is uploaded onto the **ReefLog website's** data collection platform, where it is accessible to all for free.

Text: Samar Ahmed

Design: Prabha Mallya and Barkha Avinash

Illustrations: Sanjana Singh



Making Waves

News from the coasts

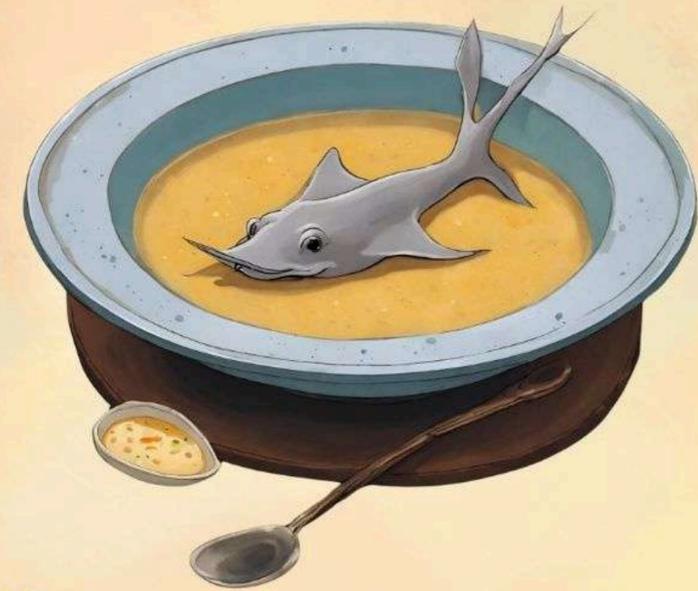
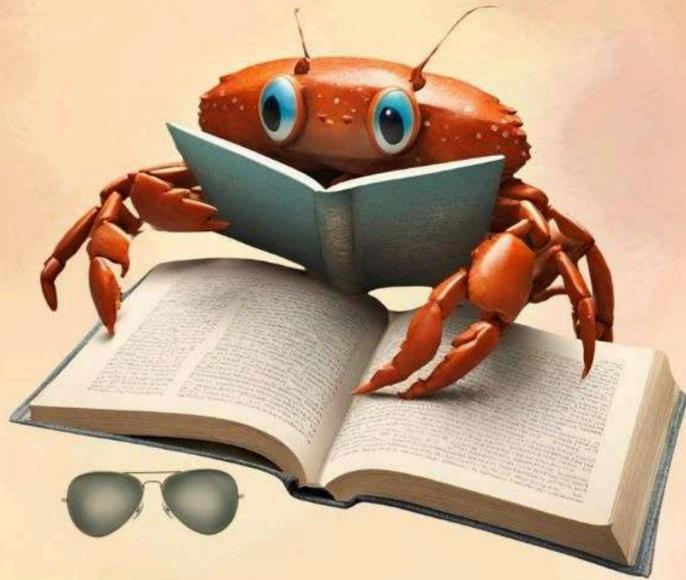


1. Discovery! Zoological Survey of India (ZSI) scientists have discovered a new species of headshield sea slug in the Bay of Bengal along the Odisha-West Bengal coast, and named it *Melanochlamys droupadi* in honour of Indian President Droupadi Murmu. Read about it [here](#).
2. Overfishing, pollution, inadequate zoning, the absence of a comprehensive marine conservation strategy and the lack of guidelines and training for dolphin-watching operators have been cited as major reasons behind increasing dolphin deaths in Goa in the last six years. Check out the [news](#).
3. A shout-out to the scientists and scuba divers who recently undertook a drive off the coast of Mithapur in Devbhumi Dwarka, Gujarat, to remove 150kg of ghost gear including monofilament gill nets from the sea bed! Read all about it [here](#).
4. University of Rhode Island professor of Ocean Engineering and Oceanography, Professor Brennan Phillips, along with his team of 15 multidisciplinary researchers from different institutions successfully demonstrated new technologies that can obtain preserved tissue and high-resolution 3D images within minutes of encountering some of the most fragile animals in the deep ocean. Here's the paper for an [in-depth read](#) and the news for a [quick read](#).
5. On the 1st of March this year, scientists from the New England Aquarium in Boston confirmed the presence of the grey whale (*Eschrichtius robustus*) off New England that was almost hunted to extinction during the era of commercial whaling two centuries ago. Read about the fascinating re-discovery [here](#).

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