

No.3, January-June 2026

KALPAMATSYA

A Biannual Shark Science
Digest from India

THE SHARK



ICAR-Central Marine Fisheries Research Institute

(Department of Agricultural Research and Education, Government of India)

P.B. No. 1603, Ernakulam North P.O., Kochi - 682 018, Kerala, India

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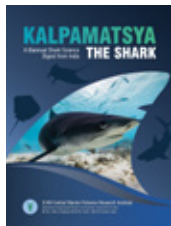
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Director
ICAR–Central Marine Fisheries Research Institute, Kochi

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From the Director's desk

As the premier national institute pioneering marine fisheries research in India, ICAR-Central Marine Fisheries Research Institute remains committed to achieving the goals of ocean sustainability and the life therein. Sharks and rays are a priority group receiving focused attention for conservation and sustainability through a dedicated national project of the Institute. ICAR-CMFRI's research on this iconic group has yielded key policy advisories that have contributed to a National Plan of Action for Sharks (NPOA-Sharks) in India and supported fishing and trade regulations for protected and vulnerable species.

Notwithstanding our role in advancing shark and ray research in India, ICAR-CMFRI has been working very closely with stakeholders, be it officials responsible for management and policy implementation or the communities whose livelihoods are supported in one way or another by fishing and/or trade of these fishes. We have also been striving to ignite in young minds the conscious urge to understand and safeguard these highly evolved yet ancient fauna. Several informative pamphlets, field identification guides, and handbooks testify to our deep commitment to shark and ray conservation, aligning with global goals of international bodies such as FAO, IOTC, CITES, and CMS.

With a team of more than twenty scientists working out of our centres in the maritime states, we have collected invaluable data on many species of sharks and rays, including rare and sparsely distributed ones, that will support science-based actions and advisories for the sustainability of these resources, while also addressing key livelihood issues of communities that are likely to be affected by increasingly stringent protective measures.

As the third volume of our biannual digest, *Kalpamatsya – The Shark*, is rolled out, I am happy to note that it includes contributions from researchers and shark conservationists, thus increasing the reach of the digest and ensuring greater participation in the movement for the well-being of these splendid fishes, which perhaps once ruled the seas but now stand threatened by human actions. In line with the vision behind this digest, we continue to bring our key research findings and conservation actions to our readers and widen the scope of shark and ray conservation awareness in the country.

Dr. Grinson George

Director
ICAR-CMFRI



Editor's voice

Dear Readers,

As we bring forth our 3rd issue, the Kalpamatsya team is extremely grateful for the positive feedback we have received for the previous 2 issues. Your feedback motivates us to move forward, hoping to contribute in our little ways to shark conservation and management in India. Some of us were quite fortunate to be part of the Sharks International 2026 held at Colombo, Sri Lanka in May 2026, which brought together over 850 elasmobranch researchers in their common quest to conserve this majestic aquatic fauna. Members of the Kalpamatsya team were able to share their work, ranging from status and management of mobulid rays in India to non-marine elasmobranchs, the details of which are given in this issue. It was a great opportunity to meet with fellow shark researchers of the region and to listen to stalwarts in shark research from around the world. We express our thanks to the Indian Council of Agricultural Research for the opportunity to travel to Sri Lanka. And a big thanks from team Kalpamatsya to the organizers of Sharks International 2026 for putting up a great event. It was also exciting to network with other Indian shark researchers, many of whom are part of the Indian Shark and Ray Research Network (ISRN), a great platform for students and researchers to connect regarding shark research in India. For those of you who are not familiar with the group, I urge you to read Alissa's article in this issue.

In addition to our regular sections, I am also thrilled to share an article by Meghna Binraj, who is a marine conservation scientist and passionate not just about conservation but about creating a space for young researchers to belong to. You must have noticed the mighty shark photo on the cover, taken by Anup from the Maldives. Nothing showcases the beauty of elasmobranchs more than photographs taken in their natural habitats. We are also happy to showcase elasmobranch cartoons created by Anju who is passionate about conserving sharks, even though she leads a very non-aquatic professional life!

We hope that the contents of this issue of Kalpamatsya keep you engaged and interested in elasmobranch research in India. We look forward to hearing your comments and suggestions on how to improve further. Let's all work towards a sustainable future for sharks and rays

Muktha M
Editor-in-Chief

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Research Snapshots

Advancing Understanding of Shark and Ray Life Histories

The first volume of KALPAMATSYA documented patterns of diversity and rare landings, while Volume II explored the distinctive biological traits that make sharks and rays unique. Volume III marks an exciting shift from biological discovery to actionable conservation science. Drawing upon recent publications from 2023 to 2025, this volume showcases cutting-edge research that illuminates population dynamics, reveals hidden genetic structures, and addresses the socio-economic realities of elasmobranch utilization. These findings provide the scientific foundation needed to guide national policy and safeguard India's elasmobranch heritage.

The Spadenose Shark's Balancing Act: Fast Growth, Few Babies



The spadenose shark, *Scoliodon laticaudus*, is one of the most common sharks landed along India's coast, especially off Maharashtra. This small shark is caught in large numbers but we know surprisingly little about how its populations are actually faring. Recent research reveals that the spadenose shark grows relatively fast compared to its larger cousins, which should help it bounce back from fishing pressure. However, this advantage is offset by a major problem—the sharks produce very few offspring, typically just 1 to 19 pups per season. Combined with intense fishing pressure and habitat loss in coastal areas, the species

remains vulnerable and classified as Near Threatened. Understanding the growth patterns of this common shark is crucial because it helps fisheries managers predict how quickly populations can recover from fishing. The research provides baseline data that can be used to monitor population health over time and set sustainable catch limits.

(Gladston et al., 2025)

One Shark, Two Secrets: The Hidden Genetic Divide



Here's a stunning discovery: the spadenose sharks living on India's east coast are genetically distinct from those on the west coast. In fact, they're so different that scientists now think they might be an entirely different species! This hidden genetic diversity means we cannot manage them as one population—each coast needs its own conservation strategy. The restricted gene flow between the two coasts is likely due to the limited ability of nearshore sharks to disperse long distances and their tendency to return to their birthplace to breed. This cryptic species-level diversity is a reminder of how much we still have to learn about our marine neighbors. For conservation managers, this discovery has major implications: strategies that work for the west coast population might not work for the east coast population if applied uniformly. Genetic research like this is essential for developing effective conservation plans.

(Sukumaran et al., 2023)

The Guitarfish Mystery: Finally Revealing Nature's efficient Hunter

The widenose guitarfish, *Glaucostegus obtusus*, is a critically endangered species that is usually found close to the seafloor. With its flattened body and long snout, it looks like a cross between a shark and a ray and is equally vulnerable to extinction. For years, scientists knew almost nothing about how this species reproduces or where it lives. New research from ICAR-CMFRI has finally filled these gaps with information collected on the species from the Arabian Sea. The



guitarfish has a continuous breeding cycle, with pregnant females found throughout the year, though more commonly during the post-monsoon and pre-monsoon seasons. Females grow larger than males and mature at around 60 cm, while males mature at 50 cm. Each female produces between 2 to 14 pups. The study also revealed that this species is a specialized hunter, feeding mainly on crustaceans and small fish on the seafloor. Understanding the reproductive biology and feeding habits of this rare species is essential for designing effective conservation strategies and identifying critical habitats that need protection.

(Purushottama et al., 2025)

The Guitarfish Crisis: When We Fish Faster Than They Can Breed



Another guitarfish species, the smoothback guitarfish (*Rhinobatos lionotus*), is facing a crisis in the Bay of Bengal. This benthic species inhabits coastal areas and river mouths, making it especially vulnerable to fishing pressure. A new assessment paints a troubling picture: the population is being fished at unsustainable levels. The study found that females grow larger than males and mature later, and the stock is dominated by females, a sign that something is wrong. Most alarmingly, the average

size of caught fish is smaller than what would be needed for a healthy population, indicating classic "growth overfishing" where we are catching fish before they can reproduce. The spawning stock has been depleted to dangerously low levels. To save this species, researchers recommend cutting fishing pressure significantly, establishing seasonal closures during breeding times, protecting nursery areas, and using special devices in trawl nets to reduce accidental catches. Without these measures, this species could disappear from Indian waters entirely.

(Sen et al., 2025)

A Secret Maternity Home: Where the Ocean's Giants Give Birth



The Gulf of Mannar and Palk Bay hold a remarkable secret; they are a maternity home for some of the world's most endangered rays. Devil rays, or mobulids, are massive filter-feeding rays prized for their gill plates in international markets. They are also incredibly vulnerable because they grow slowly, mature late, and produce just one pup at a time. For the first time ever in India, researchers documented pregnant females of three endangered devil ray species: the longhorned pygmy devil ray, the oceanic manta ray, and the bentfin devil ray. The fact that pregnant females appear predictably in November suggests this area is a critical breeding ground. One species, the bentfin devil ray, was found feeding heavily on needle squid in these waters. These findings are critical for conservation; they identify a critical habitat that desperately needs protection through marine protected areas or seasonal fishing closures during breeding season. Protecting this nursery could be the key to saving these magnificent creatures from extinction.

(Remya et al., 2025)

The Living Chainsaw: Sawfishes, Temples, and Hope for Survival



Sawfishes are unmistakable with their long, toothed snouts, they look like living chainsaws. Sadly, they are also among the most threatened fish in the world. In India, these remarkable creatures have a deep cultural significance. Fishers offer sawfish rostra to local deities in temples, believing they offer protection from storms. A comprehensive historical review uncovered 223 documented captures of sawfishes from India over two centuries, mostly the largetooth sawfish and the narrow sawfish. The study even found rostra displayed in temples with inscriptions dating back decades, showing how important these animals were to fishing communities. Despite legal protection since 2001, sawfishes continue to be caught accidentally. The largest numbers come from northwestern India, but they have also been reported in southern states and even rivers. The research emphasizes that saving sawfishes requires more than just laws, it needs culturally sensitive awareness programs that engage fishing communities and religious leaders, better training for safe release of accidentally caught fish, and stronger enforcement. By respecting the cultural connections people have with these animals, we might just be able to bring them back from the brink.

(Tyabji et al., 2025)

A Deep-Sea Surprise: Meet India's Newly Discovered Angel Shark

Even as we learn more about the oceans, we realize that there is so much more to learn about her biodiversity. Scientists recently discovered a completely new species of angel shark living in the deep waters off India's southwestern coast. These



deep-sea sharks were initially thought to be the African angel shark, but detailed analysis revealed they were an entirely different species. The new species, named Lea's angel shark (*Squatina leae*), is distinct in color, skeletal structure, and genetics. It is also smaller than its African cousin at both birth and maturity. This discovery is exciting for several reasons: it shows that even well-studied groups like sharks still have secrets, and it highlights how much of the ocean remains unexplored. Angel sharks are facing extinction threats globally, with over half the known species at risk. Finding new species in the deep ocean reminds us that we need to continue exploring and protecting these mysterious frontier habitats. Every new species discovered is a new story to tell about ocean biodiversity and a new species that needs conservation attention.

(Weigmann et al., 2023)

Beyond the Fin: The Hidden Trade in Shark and Ray Products



While shark fin trade is prohibited in India, new research indicates that elasmobranchs are being fully utilized in India through a complex domestic market. Beyond just meat, there is robust trade in liver oil, skin, cartilage, jaws, and ray gill plates. The supply chain is intricate, involving fishers, auctioneers, wholesalers, retailers, and local

vendors. What is particularly interesting is how dried shark meat has expanded into inland states far from the coast, including northeastern regions. Products move between states in complex patterns, often ending up far from where they were caught. This hidden trade is driven by growing demand but lacks transparency and traceability. To make it sustainable, researchers recommend better registration systems, improved quality control, clearer tracking of products from catch to sale, and better coordination between fisheries management and conservation agencies. Understanding this supply chain is crucial because sustainable trade can actually incentivize better fishing practices and support coastal communities while protecting shark populations.

(Kizhakudan et al., 2024)

Do Indians Really Eat Sharks? What Consumers Actually Think



Here's something surprising: most people in India don't actually eat much shark meat, and many don't even know that some sharks are legally protected. A study surveying consumers across coastal states found that shark meat consumption is low and decreasing due to irregular supply. More importantly, over 60% of consumers were completely unaware that certain shark species are protected by law. Even more encouraging for conservation: people are not emotionally attached to eating shark meat. If other fish were available, they would happily switch. This is actually good news! It means that protecting more shark species would not face strong consumer resistance. The study highlights a critical gap: most people simply don't know about shark conservation. The solution is clear: we need to integrate marine

conservation into school curricula, run awareness campaigns in fish markets and fishing harbors, and promote sustainable shark products through certification schemes. By educating consumers and showing them alternatives, we can build social support for shark protection without harming fishing communities' livelihoods.

(Muktha et al., 2024)

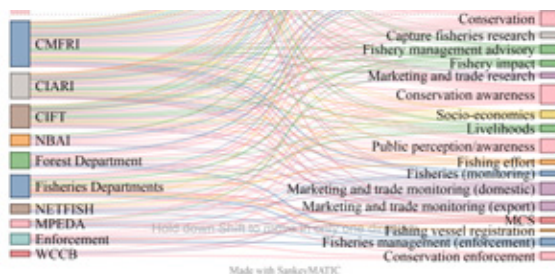
Sharks in the Net: Understanding Artisanal Fisheries and Conservation



India's artisanal fisheries interact with sharks primarily as bycatch rather than through targeted fishing. Understanding the status of sharks in these diverse fisheries is crucial for developing effective conservation strategies. Recent research examined how sharks are caught, landed, and utilized across India's artisanal fishing sector. The findings show that while some shark species are common in catches, others are increasingly rare or absent from landings. The study emphasizes that effective shark conservation must account for the realities of artisanal fisheries, the diverse fishing methods, the economic importance of fishing communities, and the multi-species nature of catches. Rather than imposing blanket bans, conservation strategies need to be tailored to specific fisheries and species. The research provides critical baseline data for monitoring changes in shark populations over time and for assessing the effectiveness of conservation measures. It also highlights the need for better coordination between fisheries management agencies and conservation organizations to ensure that shark protection does not inadvertently harm fishing communities.

(Muktha et al., 2024)

Building the Blueprint: India's Path to Shark Conservation

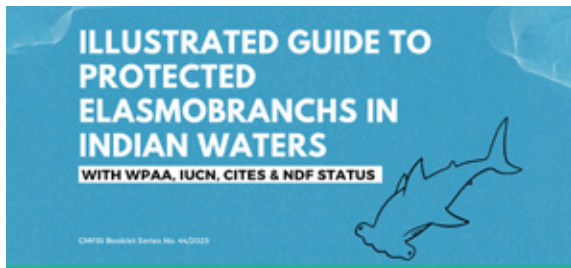


Bringing together researchers, fishers, traders, and policymakers, ICAR-CMFRI organized a national consultative meeting to tackle elasmobranch conservation challenges. The consensus was clear: India needs a comprehensive National Plan of Action for Sharks (NPOA-Sharks) that addresses all elasmobranch species, not just the commercially important ones. The meeting identified critical gaps in current management frameworks. While some species like the Ganges shark and sawfishes have virtually disappeared from Indian waters, others are declining rapidly. The recommendations include enhanced species-specific monitoring, better genetic studies to understand population structure, and establishing Non-Detriment Findings (NDFs) for traded species to ensure international trade doesn't threaten populations. The key insight is that effective conservation requires bridging the gap between science, economics, and governance. By involving all stakeholders from fishers who know the ocean best to conservation organizations pushing for protection—India can develop strategies that work for both people and sharks. This consultative approach ensures that conservation measures are practical, equitable, and likely to succeed.

(Akhilesh et al., 2023)

Know Your Protected Sharks: A Visual Guide

Knowing which sharks and rays are protected is the first step to protecting them. ICAR-CMFRI has compiled a comprehensive illustrated guide documenting the conservation status of

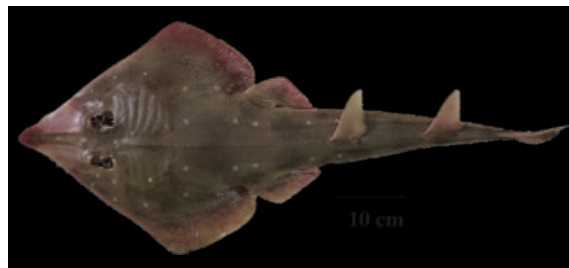


elasmobranchs in Indian waters under national laws (Wildlife Protection Act), international lists (IUCN Red List), trade regulations (CITES), and sustainability assessments (Non-Detriment Findings). This guide is a practical tool for fishers, traders, enforcement officers, and conservation workers. It provides clear identification features, distribution information, and conservation status for each species. By making this information accessible and visual, the guide helps ensure that protection laws are actually implemented on the ground. When fishers can easily identify a protected species and know why it's protected, they are more likely to release it safely. When traders understand the legal status of products they are selling, they can make informed decisions. This kind of practical, accessible information is often the missing link between good conservation policies and real-world implementation. The guide represents a significant step toward making shark and ray conservation a shared responsibility across all sectors.

(Wilson et al., 2025)

The Stock Health Check: Sharks and Rays of the Northwest

The north-west coast of India is one of the most productive fishing zones, but understanding which fish stocks are healthy and which are in trouble requires careful analysis. A new study assessed the status of demersal fish stocks, including three elasmobranch species. The research examined two shark and guitarfish species: the Bengal guitarfish, the grey sharpnose shark, and the spadenose shark. The findings paint a concerning picture. The Bengal guitarfish was found to be overfished, with very low present biomass, though recent trends show some signs of recovery. The grey sharpnose shark



was also assessed as overfished, indicating that fishing pressure has exceeded sustainable levels. The spadenose shark, meanwhile, is fully exploited, meaning it is being fished at the maximum sustainable level and any increase in fishing pressure could push it into overfished status. What's important about this research is that it shows different shark and guitarfish species respond very differently to fishing pressure, even within the same fishery. This means management strategies must be tailored to each species rather than treating all elasmobranchs the same way.

(Rahangdale et al., 2024)

Nursery of the Giants: Where Baby Elasmobranchs Grow Up



Estuaries are some of the most important habitats for sharks and rays, serving as nurseries where juveniles grow before venturing into deeper waters. A study of the Zuari estuary in Goa examined the spatial and temporal patterns of juvenile elasmobranch distribution over two years. The research documented 727 individual elasmobranchs belonging to 18 species from seven families. Juvenile and sub-adult life stages dominated the catch, confirming that the estuary is indeed a critical nursery habitat. The most abundant species were the spadenose shark, blacktip shark, and several guitarfish species. Interestingly, species

richness and diversity were highest in the lower estuary reaches with brackish water conditions, suggesting that these intermediate salinity zones are particularly important for elasmobranch diversity. The study revealed a striking seasonal pattern: elasmobranch abundance was very high during the dry season when salinity was higher, but dropped dramatically during the wet season. This seasonal variation suggests that elasmobranchs move in and out of the estuary depending on environmental conditions. The research highlights the critical importance of protecting estuaries from urbanization and climate change impacts, as these habitats are essential for the survival of many shark and ray species.

(Sreekanth et al., 2023)

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ICAR-CMFRI @ Sharks International 2026



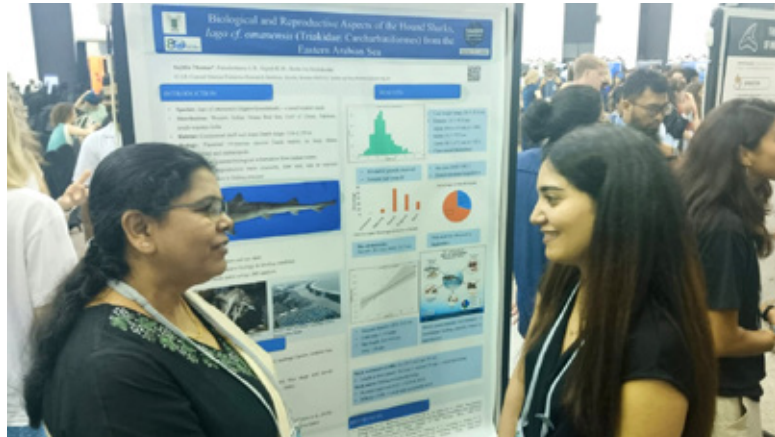
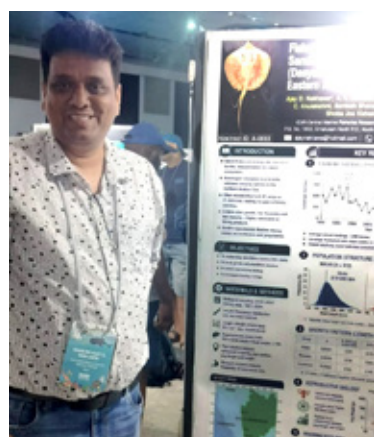
Eight scientists from ICAR-CMFRI attended Sharks International 2026 held at Colombo, Sri Lanka during 05-08 May 2026. The team led by Dr Shoba Joe Kizhakudan, Head Finfish Fisheries Division, included Dr Sujitha Thomas, Dr Muktha M, Dr Subal Kumar Roul, Dr Livi Wilson, Dr Remya L, Shri Ajay D Nakhawa and Dr Y Gladston. Team CMFRI had both oral talks as well as poster presentations in SI 2026 as listed below that covered a range of topics from species diversity, biology, stock status and conservation challenges:

- Decoding stock health: LBB-based assessment of eight elasmobranch species in the northwestern Bay of Bengal, India (Subal Roul et al., oral presentation)
- Empowering conservation action: development and application of a multilingual visual guide for protected elasmobranchs in India (Livi Wilson et al., oral presentation)
- Non-marine elasmobranchs of India: current status, challenges and future (Swatipriyanka Sen et al., oral presentation)
- Elasmobranch diversity and fishery dynamics in India's oceanic Islands: Impacts of gear type on threatened elasmobranch species (Gladston et al., oral presentation)
- Homogeneity in the elasmobranch diversity of coastal smallscale fisheries? Comparative analysis of coastal elasmobranch assemblage in

the eastern Arabian Sea, India (Akhilesh et al., oral presentation)

- Fishery occurrence and biological insights of the Sandwich-Tail Whipray *Brevitrygon manjajiae* (Dasyatidae) from the Maharashtra Coast, Eastern Arabian Sea (Ajay Nakhawa, poster presentation)
- Balancing conservation and fishery interests: status and management of mobulid rays in India (Remya et al., poster presentation)
- Biological and reproductive aspects of the Hound Sharks, *Iago cf. omanensis* (Triakidae: Carcharhiniformes) from the Eastern Arabian Sea (Sujitha Thomas et al., poster presentation)
- The biology and diet of the Indian Ocean mask ray *Neotrygon indica* from southwestern Bay of Bengal (Muktha et al., poster presentation)

SI 2026 provided an opportunity for Team CMFRI to witness first-hand the multitude of research being conducted globally on elasmobranchs. On the other hand, Team CMFRI was able to highlight the elasmobranch research being carried out in India by ICAR-CMFRI. The conference provided a golden opportunity to listen to stalwarts in elasmobranch research and network with like-minded researchers from around the world. For many of us, the conference was a great opportunity to meet renowned researchers whose works we had cited. We look forward to the next edition of Sharks International at Sabah, Malaysia!



Success Stories

The study on the biology and stock assessment of the Bowmouth Guitarfish, *Rhina ancylostomus*, in Indian waters represents a landmark contribution to the understanding and conservation of this globally threatened elasmobranch species. This pioneering research generated valuable baseline information on the species' biological characteristics, including size composition, growth, reproductive biology, feeding ecology, distribution, and population dynamics. Furthermore, the stock assessment provided the first scientific insights into the exploitation status and sustainability of the species in Indian waters, thereby filling a critical knowledge gap essential for evidence-based fisheries management and conservation planning. The findings have significantly enhanced the scientific understanding of the species and serve as an important reference for researchers, fisheries managers, and conservation agencies working towards the sustainable management of shark and ray resources.

In recognition of these scientific contributions, Dr Purushottama, G. B., Senior Scientist at ICAR-CMFRI

was invited to become a member of the working group of SharkRay360, an international multi-consortia initiative comprising leading experts, scientists, conservation practitioners, and policy specialists dedicated to the conservation of bowmouth guitarfish worldwide. As part of this international collaboration, Dr Purushottama participated in the Population Viability Analysis (PVA) Workshop on the bowmouth guitarfish, *Rhina ancylostomus*, jointly organized by the IUCN SSC Conservation Planning Specialist Group and Shedd Aquarium, USA, from 12–14 May 2025 at Resorts World Sentosa, Singapore. The workshop brought together global experts from 24 countries to evaluate the species' conservation status, identify threats, assess population viability, and formulate science-based recovery strategies. Participation in this prestigious international forum reflects the global recognition of Dr Purushottama's expertise and underscores the impact of his research in shaping conservation priorities and management strategies for one of the world's most endangered wedge fish species.





Spotlight

Orbiraja powelli (Alcock, 1898)

Indian Ring Skate



Orbiraja powelli (Alcock, 1898), commonly referred to as the Indian Ring Skate, is a benthic elasmobranch belonging to the family Rajidae. The species is distributed throughout the northern Indian Ocean, including the Arabian Sea, Lakshadweep Sea, and Bay of Bengal, where it inhabits the continental shelf and upper slope ecosystems at depths ranging from 15

to 460 m. As a demersal species, *O. powelli* is closely associated with soft-bottom habitats and constitutes an important component of deep-water elasmobranch groups. The species is characterized by a rhomboidal disc, a relatively slender tail, and a pair of prominent ocellated markings on the dorsal disc surface, which serve as key diagnostic features. The genus name



Orbiraja is derived from these distinctive ring-shaped 'ocelli'. The dorsal coloration is generally brown to greyish brown, providing effective camouflage against the benthic substrate. Like other rajids, *O. powelli* exhibits oviparity, depositing encapsulated eggs commonly known as "mermaid's purses."

Beyond these foundational traits, recent research highlights that *O. powelli* plays a vital role as a mesopredator, preying primarily on benthic invertebrates such as crustaceans and polychaetes, which helps regulate energy flow within deep-sea food webs. Morphological studies have also revealed subtle sexual dimorphism in dentition and thorn distribution, suggesting specific reproductive or competitive behaviours that are still being elucidated. The species exhibits a relatively low reproductive output characteristic of K-selected species, meaning the maturation process is slow and the number of offspring produced is limited, which significantly hinders population recovery from anthropogenic disturbances.

Despite its wide geographic distribution, information

on the biology and ecology of *O. powelli* remains limited. The species is not a targeted fishery resource but is encountered as incidental bycatch in bottom trawl and deep-sea fisheries operating along the Indian coast. Consequently, data on its population structure, reproductive biology, growth dynamics, feeding ecology, and stock status are scarce. Given the increasing fishing pressure on continental shelf and slope ecosystems, the potential vulnerability of deep-water elasmobranchs warrants focused investigation. Recent studies from the southwest coast of India have improved our understanding of the species taxonomy, morphometrics, distribution, and life-history characteristics. However, comprehensive assessments integrating fishery-dependent and fishery-independent data are required to evaluate its conservation status and formulate appropriate management strategies. As an integral component of the deep-sea benthic ecosystem, *O. powelli* represents the largely understudied diversity of Indian elasmobranch fauna and highlights the need for continued research and monitoring of deep-water cartilaginous fishes.

Viewpoint

Non-marine Elasmobranchs in India: Hidden biodiversity in mixed landings

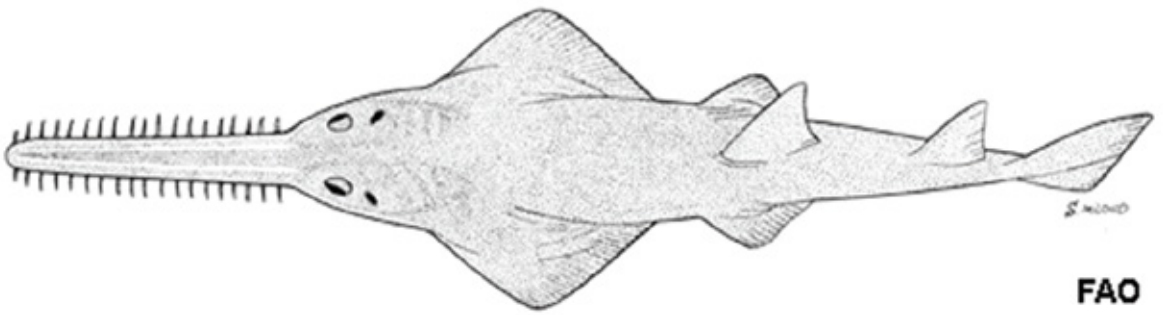
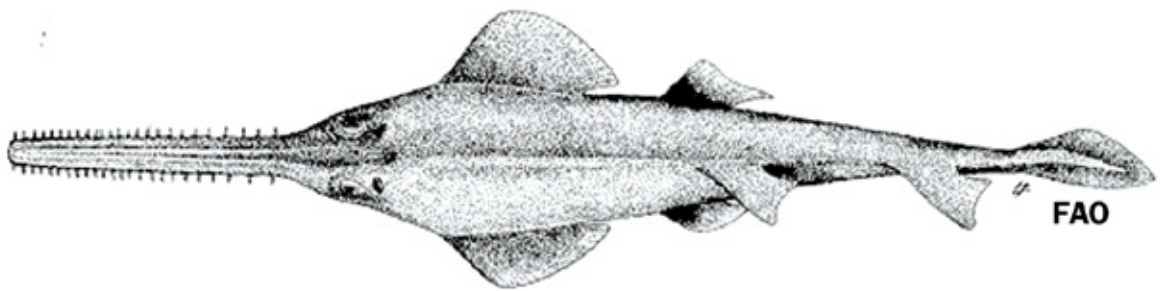


Pristis pristis (Largetooth Sawfish)

When we think of sharks and rays, we usually imagine the open sea. But some of India's most fascinating and threatened elasmobranchs are found much closer to land—in rivers, estuaries, mangrove creeks, lagoons, tidal channels and river mouths. These are not always strictly freshwater species, but many use low-salinity and brackish-water habitats during important stages of their life. This makes them a special group that sits between inland fisheries, marine fisheries and biodiversity conservation. India is naturally important for such species. The Ganga–Hooghly, Brahmaputra, Mahanadi, Godavari, Krishna, Narmada and Tapi systems, along with the Sundarbans, Chilika lagoon

and numerous smaller river mouths, create rich transition zones between rivers and the sea. These areas support fishing livelihoods, but they may also serve as feeding, nursery or movement habitats for rare sharks, rays, sawfishes, guitarfishes and wedgefishes.

The Ganges shark, *Glyphis gangeticus*, is perhaps the most striking example. It is one of the rarest river sharks in the world, and any suspected record from India needs very careful confirmation. The bull shark, *Carcharhinus leucas*, is more likely to be encountered in estuaries and river mouths, but it can be confused with rare river sharks. The giant freshwater whipray,



Urogymnus polylepis, is another species of high interest, especially where large or pregnant individuals are reported from river–estuary–coastal systems. Sawfishes, once known from rivers and estuaries, have now become extremely rare and need urgent documentation wherever they occur. Apart from these well-known species, several other sharks, rays and guitarfishes also need attention within India’s non-marine and estuarine-associated elasmobranch framework. One major problem is that these animals often remain hidden in mixed fish landings. They may be caught accidentally in gillnets, longlines, stake nets, shore-based gears or trawls. Many are recorded only under local names such as general “shark” or “ray”, and rare species may be sold or discarded before scientists can examine them. Because of this, we may be losing important information without even realising it. Small-scale fishers can play a very important role here. They work close to river mouths, lagoon openings, surf zones, mangrove creeks and shallow coastal waters the very places where these rare or juvenile

elasmobranchs may appear. With simple identification guides, fisher logbooks, WhatsApp-based photo reporting and local-language awareness, fishing communities can become the first observers and protectors of these species.

Future research should focus on more than just listing species. We need to know where these animals occur, when they appear, whether juveniles or pregnant females are present, which gears catch them, and whether live animals can be safely released. DNA barcoding will also be important because many sharks and rays are difficult to identify correctly in landing-centre conditions. The conservation of non-marine elasmobranchs in India needs a river-to-sea approach. Landing-centre monitoring, fisher knowledge, habitat mapping, molecular confirmation and rapid reporting systems should all come together. These species remind us that shark and ray conservation does not end at the coastline. It must continue into the estuaries, lagoons and rivers where some of India’s rarest elasmobranchs may still survive.

Conservation Corner

Rescue and Release of Schedule I Protected Widenose Guitarfish at Majali Fish Landing Centre, Karwar, Karnataka



On 6 February 2026, scientists from the Karwar Regional Station of ICAR-CMFRI, Karnataka successfully facilitated the rescue and release of four live widenose guitarfish (*Glaucostegus obtusus*), a species accorded the highest level of legal protection under Schedule I of the Wildlife (Protection) Act, 1972, as amended in 2022. The species has experienced a severe population decline due to overexploitation and incidental capture in fishing operations, making every

successful rescue an important contribution to its conservation.

During a routine visit to monitor fish landings at the Majali Fish Landing Centre, located approximately 12 km from Karwar near the Karnataka–Goa border, Dr. Mahesh V. and Dr. Kurva Raghu Ramudu observed four live widenose guitarfish that had been accidentally entangled in a gillnet. The specimens measured 45, 52, 63, and 77 cm in total length and 16, 19, 22 and 28 cm



in disc width, comprising two males and two females. Locally known as “Torake,” these rays are occasionally caught as bycatch, highlighting the continued threat faced by this endangered species despite existing legal safeguards.

Recognizing the opportunity for conservation outreach, the scientists immediately interacted with the fishermen and explained the ecological importance and protected status of the species. They created awareness about the provisions of the Wildlife (Protection) Act (Amendment), 2022, emphasizing that the capture, possession, transport, and trade of Schedule I species are strictly prohibited. The

fishermen were also advised that any live individuals accidentally caught should be released back into the sea without delay, while accidental mortality should be promptly reported to the concerned authorities. Motivated by the awareness provided by the ICAR-CMFRI scientists, the fishermen voluntarily released all four guitarfish safely into their natural habitat. The successful rescue demonstrated the importance of continuous engagement with fishing communities and highlighted how scientific intervention, legal awareness, and stakeholder cooperation can collectively contribute to the conservation of threatened marine fauna.

Fun with Sharks

Conversations with a shark



Shark: Hey little one! Why are you swimming so fast?

Sardine: Because you are a shark! I thought you were coming to eat me!

Shark: Haha, don't worry. I already had my lunch.

Sardine: Many times I wonder, Shark, those small holes near your eyes or on your head... what are they for?

Shark: Ah, you mean my spiracles!

Sardine: Yes, spiracles! Do you breathe through them?

Shark: In some way, yes. Spiracles help some sharks take in water when they are resting on the sea bottom.

Sardine: Then what happens to that water?

Shark: The water goes in through the spiracles, passes over the gills, and helps me get oxygen.

Sardine: Oh! So it is like an extra water inlet for breathing?

Shark: Exactly. It is very useful for sharks that stay near the bottom, like rays and some bottom-living sharks.

Sardine: But do all sharks have spiracles?

Shark: No. Some fast-swimming sharks have very small spiracles or do not depend much on them. They usually take water through the mouth while swimming.

Sardine: Shark, I heard that you can smell blood from miles away. Is that true?

Shark: Haha, that is a big ocean rumour!

Sardine: So it is not true?

Shark: Not exactly. I do have a very strong sense of smell, and I can detect tiny amounts of blood or fish scent in water.

Sardine: Then you can smell one drop of blood from anywhere?

Shark: No, no! The smell must travel with the water current. I cannot smell across the whole ocean like magic.

Sardine: So if the current brings the smell to you, you may notice it?

Shark: Correct. If the scent comes my way, I can follow it. But "smelling blood from miles away" is mostly an exaggeration.

Sardine: Ah, so you are not a sea vampire!

Shark: Haha, definitely not! I am just good at smelling food in water.

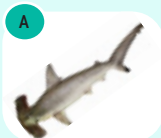
Sardine: Oh no! That means you can smell sardines too?

Shark: Haha, yes, but don't worry. Today I am only using my nose for friendly conversation!

Sardine: Good. Then I will stay away from your nose and the current!

Shark: Smart buddy!

Shark Species Identification Challenge



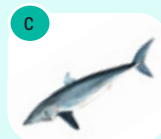
Hammerhead Shark

Distinct hammer-shaped head with wide-set eyes.



Whale Shark

Largest fish in the world. Feeds on tiny plankton.



Shortfin Mako Shark

Fast, powerful and built for speed.



Tiger Shark

Apex predator with a varied diet. Striped pattern.



Bull Shark

Strong, adaptable and can enter rivers

1

Match the Characteristic

1. Largest fish in the world: _____
2. Fastest shark: _____
3. Filter feeder: _____
4. Hammer-shaped head: _____
5. Frequently enters rivers: _____

2

Conservation Thinking

Scientists observe that a species has declined by 40% in ten years. Additional observations: Slow growth, late maturity, low reproductive rate.

Question: Why are sharks with these characteristics particularly vulnerable to overfishing?

Answer: _____

3

Adaptation Detective

Which shark is most likely to possess the following adaptation ?

Write the correct letter (A-E) and explain why.

1. A broad head that improves sensory detection.

Answer: ____ Why: _____

2. A streamlined body designed for high-speed pursuit.

Answer: ____ Why: _____

3. Specialized filtering structures for feeding on plankton.

Answer: ____ Why: _____

4. Physiological adaptations allowing survival in freshwater.

Answer: ____ Why: _____

4 Ecological Role Analysis

Scenario A:

A large shark species feeds primarily on plankton and small organisms.
Would this species be considered: Apex
Predator / Filter Feeder / Herbivore / Scavenger

Explain:

Scenario B:

A shark regularly hunts tuna and other fast-moving fishes in open waters.

Species (A-E):

Explain:

Scenario C:

Researchers observe a shark moving between rivers and coastal waters.

Species(A-E):

Explain:



Marine Scientist's Note

Species identification is one of the most important skills in marine biology. Correct species identification helps scientists to:

- Monitor populations
- Track migration
- Assess conservation status
- Understand ecosystem dynamics
- Design effective conservation strategies

5 Migration Challenge

Which shark is most likely to:

Behavior: Undertake long-distance migrations

Species (A-E)

Behavior: Feed mainly on plankton

Species (A-E)

Behavior: Live in both freshwater and seawater

Species (A-E)

Behavior: Reach speeds above 70 km/h

Species (A-E)

Behavior: Function as an apex predator

Species (A-E)

? Challenge Question

Why is the Whale Shark considered a shark even though it feeds on tiny plankton instead of large prey?

- A. It has scales similar to whales.
- B. It belongs to the shark lineage and possesses shark characteristics such as a cartilaginous skeleton and gill slits.
- C. It evolved from whales.
- D. It is actually a type of ray.

Explain:

Answer key & Explanations

1: Match the Characteristic

1. B (Whale Shark)
2. C (Shortfin Mako Shark)
3. B (Whale Shark)
4. A (Hammerhead Shark)
5. E (Bull Shark)

2: Conservation Thinking

Sharks recover slowly because they grow slowly, mature late, and produce few young, making populations vulnerable to overfishing

3: Adaptation Detective

1. A – Wide-set eyes and broad head enhance sensory detection.
2. C – Streamlined body and powerful muscles enable high speed.
3. B – Gill rakers filter plankton.
4. E – Osmoregulatory adaptations allow freshwater survival.

4: Ecological Role Analysis

Scenario A: B (Whale Shark) – Filter feeder.

Scenario B: C (Shortfin Mako Shark) – Hunts fast fishes.

Scenario C: E (Bull Shark) – Moves between freshwater and marine habitats.

? Challenge Question:

Correct answer: B.

Whale sharks are true sharks because they possess the defining anatomical characteristics of sharks despite feeding on plankton

SHARK SURVIVAL CHALLENGE

Step-1 Arrange the Ocean Food Pyramid

- ◇ Can you put the organisms in the right order?

Organisms:

Tuna, Great White Shark,
Plankton, Small Reef Fish.

Energy flows. Species survive.
Ecosystems stay balanced

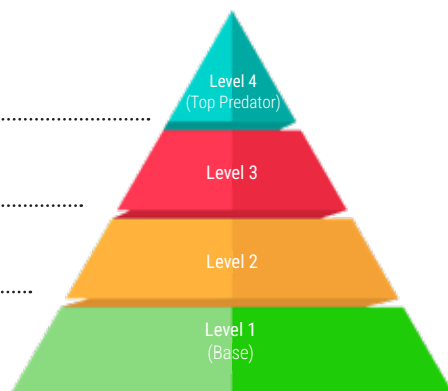
Fill in:

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Step-2**True or False**

Plankton forms the base of most marine food webs.

☐ True ☐ False

Energy available increases as we move up a food pyramid.

☐ True ☐ False

Great White Sharks are apex predators.

Tuna occupy a higher trophic level than small reef fish.

☐ True ☐ False

Removing top predators can disrupt ecosystem balance.

☐ True ☐ False

Step-3**Survival Challenge**

Which shark is the best adapted?

A. Fast-moving tuna in open water. Best shark?

- ☐ Whale shark
- ☐ Hammerhead shark
- ☐ Shortfin Mako shark
- ☐ Bull shark

B. River connects to ocean. Which shark uses both habitats?

- ☐ Whale shark
- ☐ Tiger shark
- ☐ Shortfin Mako shark
- ☐ Bull shark

C. Millions of plankton near surface. Which shark benefits most?

- ☐ Whale shark
- ☐ Tiger shark
- ☐ Shortfin Mako shark
- ☐ Bull shark

Step-4**Match the Adaptation****Sharks**

- Hammerhead Shark
- Whale Shark
- Shortfin Mako Shark
- Bull Shark
- Tiger Shark

Adaptations

- Generalist diet
- High-speed swimming
- Freshwater tolerance
- Wide sensory field
- Filter feeding

Step-5**Bonus Challenge**

If sharks disappear from the top of the pyramid, what happens first?

- ☐ A. Plankton increases
- ☐ B. Mid-level predators increase
- ☐ C. Coral reefs instantly disappear
- ☐ D. Ocean salinity changes



Ocean Hero Tip

- ▶ Protect sharks
- ▶ Protect the ocean
- ▶ Protect our future



DID YOU KNOW ?

Sharks are keystone species that help maintain ecosystem balance.



Food Pyramid Facts



Only about 10% of energy passes to the next trophic level. Fewer organisms live at the top. Healthy oceans depend on every trophic level.

Answer key

STEP 1

- Level 1 (Base): Plankton
- Level 2: Small Reef Fish
- Level 3: Tuna
- Level 4 (Top Predator): Great White Shark

STEP 4

- Hammerhead Shark → Wide sensory field
- Whale Shark → Filter feeding
- Shortfin Mako Shark → High-speed swimming
- Bull Shark → Freshwater tolerance
- Tiger Shark → Generalist diet

STEP 2

- 1. True
- 2. False
- 3. True
- 4. True
- 5. True

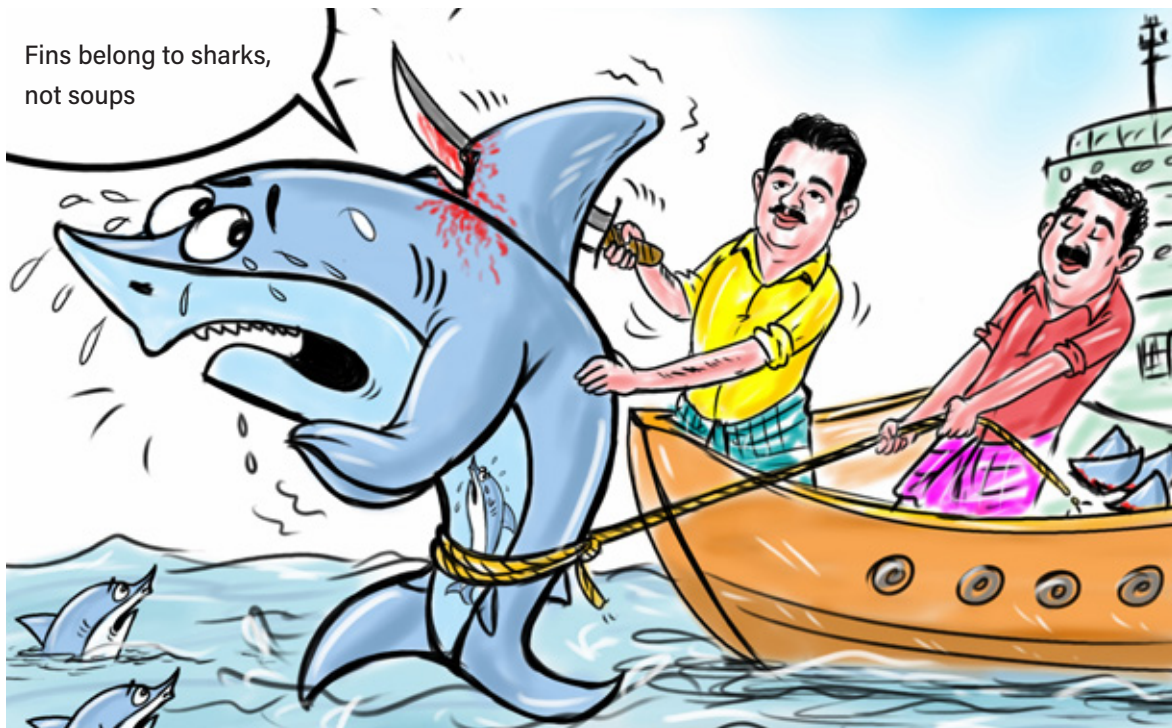
STEP 3

- A. Shortfin Mako Shark
- B. Bull Shark
- C. Whale Shark

STEP 5

Correct Answer: B. Mid-level predators increase.
Reason: Removal of apex predators allows mid-level predators to increase, disrupting the food web.

Fins belong to sharks,
not soups



Set the giant free



Shark Tales

Protected or Not? Species Identification Challenges under the Wild Life (Protection) Act

Imagine a bustling fish landing centre early in the morning. Fishing vessels return after days at sea, baskets of sharks and rays are unloaded, auctioneers call out prices, and officials inspect the catch. Amid the hundreds of fishes on the auction floor, one specimen suddenly draws attention. Is it a protected species under the Wild Life (Protection) Act (WPA) or a legally harvestable one? To an untrained eye and sometimes even to experienced fishers, the answer is not always obvious. Yet, that single identification can determine whether the catch proceeds to the market or becomes part of a legal investigation.

This scenario has become increasingly common since the recent amendments to the Wild Life (Protection) Act. While the legislation has significantly strengthened the conservation of threatened marine species, it has also brought species identification to the forefront of fisheries management. Today, identifying a fish correctly is no longer just a taxonomic exercise; it has become the foundation for effective conservation, fair enforcement and sustainable fisheries. The Wild Life (Protection) Act, 1972 is India's principal legislation for conserving wild animals, birds and plants. Enacted by Parliament as a central law, it provides a comprehensive framework for protecting wildlife, regulating hunting and trade, conserving habitats and safeguarding threatened species. For more than five decades, the Act has served as the foundation of wildlife conservation in the country. While the Act initially focused largely on terrestrial wildlife,

growing concern over declining marine biodiversity gradually brought sharks and rays into its ambit. A major milestone came in 2001, when the Act was amended to include ten species of elasmobranchs, including the iconic Whale Shark (*Rhincodon typus*), under legal protection. This marked the beginning of formal legislative protection for sharks and rays in India and reflected increasing recognition of their ecological importance and vulnerability. Marine conservation received another significant boost through the Wild Life (Protection) Amendment Act, 2022, which came into force on 1 April 2023. The amendment strengthened wildlife protection by reorganising the schedules of protected species, enhancing enforcement mechanisms and aligning Indian legislation with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). One of its most significant outcomes for marine conservation was the inclusion of 18 elasmobranch species in Schedule I and 8 species in Schedule II, extending statutory protection to several threatened sharks, wedgefishes, guitarfishes, sawfishes and rays.

These amendments represent a landmark achievement for marine biodiversity conservation. At the same time, they have placed greater responsibility on fisheries departments, forest officials, customs authorities, harbour managers, researchers and fishing communities. Successful implementation now depends not only on legislation, but also on accurately recognising protected species in the field.

India's Rich Diversity—A Challenge for Identification

India possesses one of the richest elasmobranch faunas in the Indian Ocean region. About 174 species of elasmobranchs belonging to 44 families have been documented from Indian waters, reflecting the country's remarkable marine biodiversity. However, this diversity also presents one of the greatest challenges for implementing species-based conservation laws. Many sharks and rays belonging to the same genus possess remarkably similar body shapes, fin structures and colour patterns. These similarities become even more challenging to distinguish after the fish have been landed, processed, or partially dressed. For enforcement authorities, this creates a practical dilemma. A protected species and a legally harvestable species may appear almost identical to an untrained observer. In such situations, incorrect identification may either result in unnecessary legal action against fishers or allow protected species to escape detection. For fishers operating in multi-species fisheries particularly in India, protected sharks and rays may occasionally occur as incidental catch alongside legally harvestable species. Distinguishing between them at sea is not always easy. The same challenge extends to enforcement agencies. Fisheries officers, forest departments, customs officials and harbour authorities are expected to verify catches and enforce the provisions of the Act. However, many officers come from different professional backgrounds and may not have specialised training in marine fish taxonomy. Incorrect identification can have consequences for both conservation and livelihoods. A protected species may inadvertently escape detection if mistaken for a similar non-protected species, weakening conservation efforts. Conversely, a legally harvestable species may be incorrectly identified as protected, creating unnecessary legal complications and economic hardship for fishers. Across several coastal states, there have been instances where uncertainty in species identification during inspections has required scientific verification before appropriate action could be taken. Such experiences highlight the importance of building taxonomic expertise and strengthening collaboration between scientists and enforcement agencies.

As with any new legislation, awareness is fundamental

to successful implementation. Many fishers possess extraordinary knowledge of local fish diversity, yet they may not always be familiar with recent amendments to the Wild Life (Protection) Act or with the scientific identity of newly protected species. Similarly, officers responsible for implementing the Act often require practical training to confidently distinguish protected species from closely related look-alikes. Regular awareness programmes, and training therefore become as important as the legislation itself. When stakeholders understand both the conservation importance of threatened species and the legal provisions governing them, compliance becomes easier and conflicts can often be avoided.

CMFRI's Contribution to Supporting Implementation

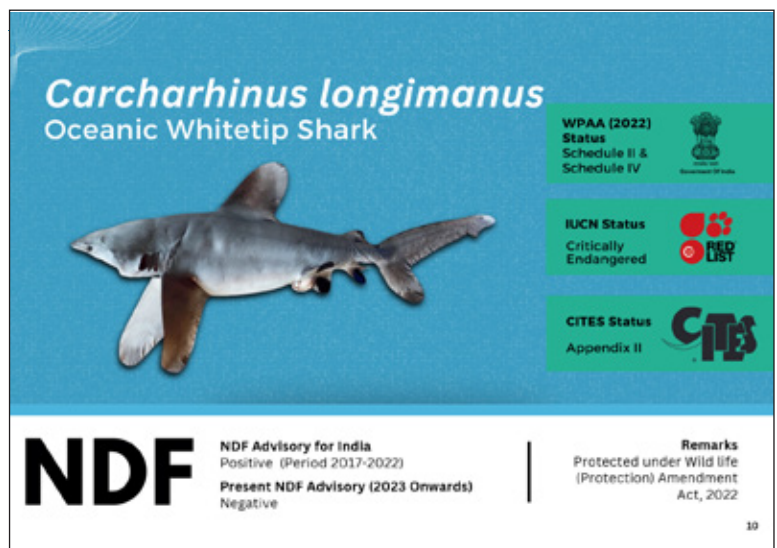
Recognising these emerging challenges, the ICAR–Central Marine Fisheries Research Institute (CMFRI) has taken several proactive initiatives to support the implementation of the Wild Life (Protection) Act. One of the Institute's major contributions has been the development of the Illustrated Guide to Protected Elasmobranchs in Indian Waters, designed specifically to facilitate field identification of scheduled sharks and rays. The guide uses high-quality photographs, enabling fisheries officers, customs officials, forest departments, researchers and fishers to distinguish protected species. Complementing this effort, CMFRI has developed awareness posters highlighting protected marine species under the Act. These posters have been widely displayed at fish landing centres, fisheries offices, educational institutions and awareness programmes, providing a quick visual reference for stakeholders.

CMFRI scientists have also organised numerous training programmes, workshops and awareness campaigns across different coastal states. These programmes bring together fisheries departments, forest officials, customs authorities, Coast Guard personnel, students and fishing communities to improve understanding of species identification, legal provisions and conservation priorities. These initiatives demonstrate how science can effectively support policy implementation. Conservation legislation becomes far more effective when supported by practical identification tools, continuous training and strong engagement with stakeholders.

Looking Ahead

The implementation of the Wild Life (Protection) Act is an evolving process. As awareness increases and identification skills improve, many of the present-day challenges can be addressed through collaboration rather than confrontation. Most importantly, conservation must remain a shared responsibility. Fishers, scientists, managers and enforcement agencies all have complementary roles to play in protecting India's rich marine biodiversity.

The inclusion of sharks and rays under the Wild Life (Protection) Act reflects India's growing commitment to conserving some of the ocean's most threatened species. However, legislation alone cannot ensure conservation success. As awareness grows and partnerships become stronger, the future of shark and ray conservation will depend not only on the laws we enact but also on our collective ability to recognise, understand and protect the incredible diversity that inhabits our seas.



Share Your Stories

The Indian Shark and Ray Network: Connecting a growing community



Alissa Barnes - *Alissa fisheries and marine socio-ecological researcher who works at the intersection of the sea, fish and the coastal communities that depend on it. She is the co-founder of the Indian Shark and Ray Network. She is always looking to build collaborations and create community spaces. Her contact is alissa.barnes@gmail.com.*

Over the past two decades, there has been a significant growth in shark and ray research in India. In many states we have gone past the stage of gathering baselines data and are steadily beginning to dig deeper into new advances. New studies have expanded our understanding of species diversity, fisheries interactions, ecology, and conservation challenges along our coasts. Alongside this growth, there has been an increasingly diverse community of students, researchers, conservation practitioners, government agencies, science communicators, educators, and coastal communities, all meaningfully contributing to the field. Yet, despite this momentum, there has been a surprising disconnect between the people working in this field.

Many of us working on sharks and rays would meet each other only occasionally, usually at conferences, workshops, training programmes, or collaborative projects. Conversations often began with a simple discovery: someone else was studying the same

species, working in a similar fishery, or grappling with the similar challenges in the field, in publications or in accessibility. These encounters were exciting, but they also highlighted a broader challenge. As we worked on sharks and rays across the country, there was no dedicated space that brought our community together. Over time, this observation surfaced repeatedly in conversations with colleagues from different institutions and organisations. Researchers entering this field, spoke about the difficulty of identifying mentors, opportunities and also resource material. Very often researchers, whether working independently or through an organisation, worked in their silos. Useful resources existed, but they were dispersed across institutions, organisations, and personal networks. As a result, opportunities for collaboration, learning and growth were often missed. It was realised that the gap was not one of expertise but one of connection. The Indian Shark and Ray Network (ISRN) emerged as a response to this need. Established in 2025, ISRN



was envisioned as a voluntary community-driven platform that could help connect people working on, or interested in sharks and rays across India. Rather than functioning as a formal institution the network is designed as a shared space where individuals can discover opportunities, access resources, build collaborations, and learn from one another - a living breathing community that adapts to challenges and shares its learning with each other within the community.

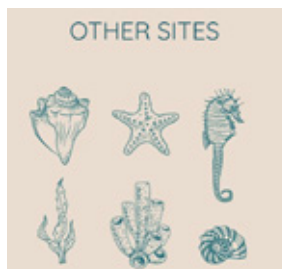
Being India's first dedicated shark and ray network, ISRN's website serves as a virtual hub for the country's growing shark and ray community. Through the website and its related communication channels (WhatsApp community & mailing list), the network brings together and highlights opportunities, publications, identification guides, reports, workshops, public talks, and other resources relevant to shark and ray science and conservation. One of its key features is the Networking page which highlights individuals working in various organisations across the country. By making this information more visible and accessible, the network seeks to make it easier for people to connect, identify collaborators, and better understand the breadth of work taking place across the country. ISRN was established with the belief that shark and ray conservation benefits from bringing together diverse thought, perspectives and expertise. The network therefore welcomes not only researchers and conservation practitioners, but also students,

educators, science communicators, managers, policymakers, and enthusiasts who share an interest in these species and their conservation.

As the network continues to evolve there are a few guiding principles that underpin its development. As a community, we seek to foster collaboration over competition, encourage the sharing of knowledge and opportunities, support early-career researchers, and create a more inclusive and connected community. Its broader vision is to strengthen the people and partnerships working towards the understanding, management, and conservation of shark and rays in India.

A significant milestone for the network came in 2026 during the Sharks International Conference where ISRN hosted its first in-person network meeting. The session brought together researchers, students, conservation practitioners, and supporters from across India, many of whom were meeting one another for the first time despite working on similar themes. The meeting provided an opportunity to introduce the network, exchange ideas, discuss future directions, and reflect on the needs of the community. More importantly, it reinforced the very reason ISRN was established: the value of creating spaces where people can connect, share experiences, and build collaborations.

ISRN is still young, and like the field it represents it continues to evolve. However, its foundation rests on a simple idea that a stronger and more connected community can help advance both research and



conservation. What began as a recurring observation in conversations among colleagues has grown into a platform dedicated to bringing together people, knowledge, and opportunities for sharks and rays in India.

As shark and ray research and conservation continue to grow in the country, ISRN hopes to play a small but

meaningful role in supporting the people behind that work and in strengthening the collective effort to better understand and conserve these remarkable animals. ISRN is free and open to all. If you would like to be part of this growing community, explore resources, or connect with others working in the field, we invite you to join the network at www.indiansharkandraynetwork.com

STEPPING INTO MURKY WATERS



Meghana Binraj - *Meghana Binraj is a transdisciplinary conservation scientist whose work focuses on sharks, rays, and chimaeras. She works independently and is a founding director of Species & Spaces Foundation, a non-profit initiative dedicated to expanding opportunities for underrepresented communities in cartilaginous fish research and education in India. Meghana also serves as the India Field Research Lead for the ICONIC Ocean Programme, an initiative of Minorities in Shark Sciences.*

Sometimes it all begins by stepping into murky waters. Not because I know what's waiting beneath the surface. But staying on the shore no longer answered my questions.

For me, that first step wasn't just into the ocean. It was into a field where I wasn't sure I belonged.

I grew up in a landlocked city and on coastlines that were visited during the summers. I did not inherit shelves lined with books, live along marine biology

books, or an academic network that could show me the way. Like many young researchers from outside traditional scientific circles, I entered a world that often felt already spoken for.

But, uncertainty has a way of sharpening curiosity. It made me ask better questions.

It taught me that sometimes the only way to know whether something is true is to leave behind what has already been written and go look for it myself.



The days catch between the toil and the tide (Pic credit: Meghana Binraj)

So, that is exactly what I did!

I walked through the fish markets before I read the manuscripts. I listened to fishers before I listened to experts. I learned to read the ocean through the people who had spent their lives reading it.

For someone like me, who had no easy access to scientific literature, people became the library.

Fish markets became my classroom. Coastlines became my open laboratories. And curiosity became the method.

Today, I see myself as a transdisciplinary conservation scientist in the field of marine systems. For me, science isn't confined to one discipline or one way of knowing. Real-world problems rarely fit neatly into academic departments, and neither should the search for their solutions. For me, conservation means bring together ecology, fisheries, sociology, history, policy, art, and lived experiences until a clear picture begins to emerge.

The more I learn, the more I question. Just like science should. People often ask me how I became interested in sharks. The answer isn't simple! It was never just about sharks.

It was about the ocean. About wanting a career that kept me outdoors rather than behind a screen or in a cubicle. About loving the process of observation more than the certainty of answers. About caring deeply for people whose voices are too often overlooked in conservation conversations. Life, of course, has a sense of humor. The funny thing is that I now spend just as much, if not more, time behind a computer than I ever wanted to.

And perhaps, somewhere in all of that, it was also about the sharks, too. These fish that have survived hundreds of millions of years, adapting to changing oceans, existing in extraordinary diversity, are powerful not because they dominate but because they endure.

I still think I'm figuring out my "why"? Perhaps, that's the point. Research isn't the art of having all the answers. It's the practice of staying curious long enough to ask better questions.

There was another important lesson I was introduced to that didn't come from the field. Instead, it came from learning what kind of scientist I did not want to be.

During my early training days, I was often encouraged to build projects around the species that attracted attention. The charismatic megafauna made for

compelling grant proposals, striking headlines, and easier funding. It made strategic sense. But it never felt like the questions I wanted to spend months or years asking. As I recall, "I remember being told to pitch for the trendiest species if I wanted the grant". But it never felt like my work!

There were moments when research stopped feeling like research and started feeling like compliance. Under established supervision, there was often little room for agency. Be it for asking different questions or exploring different ways of working. It was someone else's vision to execute, rarely my own.

Like many early-career researchers, I worked through uncertainty, the COVID-19 pandemic, and being stuck alone in the field, long hours, and immense pressure, believing that hard work would eventually make space for my own ideas. Instead, I found myself exhausted, burnt out, and wondering whether there was a place for me in science at all.

So I stepped away. From it all!

Looking back, that pause was not the end of my journey but the beginning of it all.

It permitted me to ask a different question - not, "what work gets funded?" but, "What work actually matters?" When I returned, I chose to build my research around the realities I had witnessed on the ground rather than around the trends of the moment. I started focusing on species that rarely made headlines but played vital ecological roles. I now choose to study populations that still have a chance to remain healthy instead of waiting until they become conservation emergencies. I invest in long-term rapport with fishing communities instead of short-term visibility.

The irony is that, once I stopped chasing recognition, recognition began to find me.

The grants came. The awards followed.

But now, these are no longer the destination. They were simply consequences of doing the work that I believe in.

Today, I am less interested in chasing fashionable conservation stories than in asking questions that will still matter decades from now. Conservation, I believe, is not only about rescuing species on the brink of extinction. It should also be about keeping common species common, protecting healthy populations before they become crisis stories. And building systems that prevent loss rather than merely documenting it.

Also, conservation isn't only about protecting species. It is also about creating safe spaces for conservationists and creating possibilities for them to participate in important science like this.

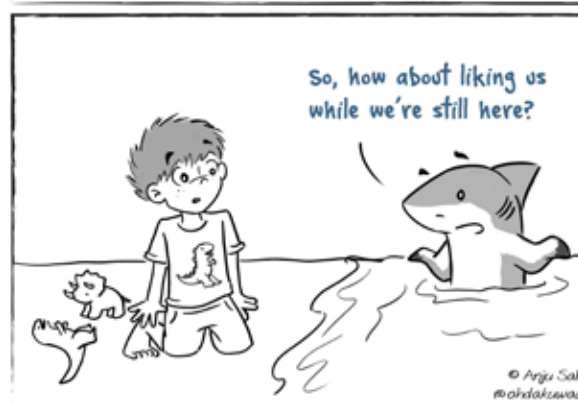
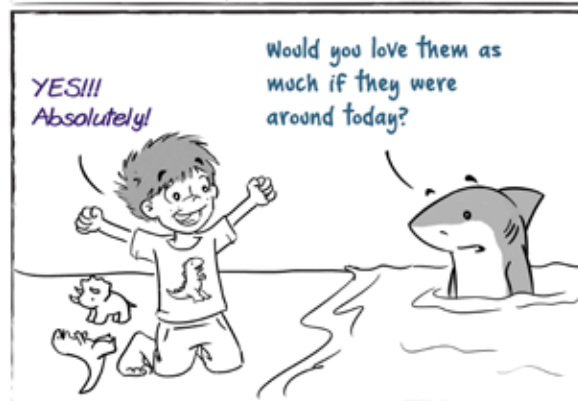
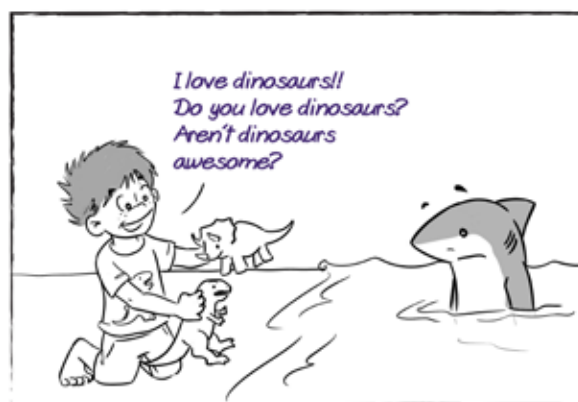
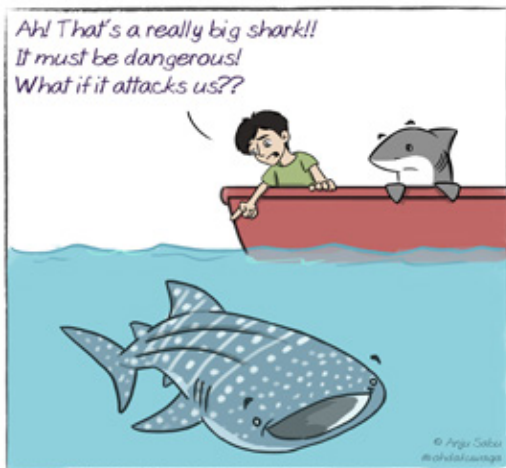
Having navigated a field where opportunities often feel uneven, competitive, passion-driven exploitation and gatekeeping are real. I now spend as much time creating spaces as conducting research. Through Species & Spaces Foundation and projects like WAVES: Widening Access and Versatility in Education in Shark Sciences, I am working to ensure that the next student who loves sharks but doesn't come from the "right" place or know the "right" people, but knows a community that says, "You belong here"!!

For me, such a community is - Minorities in Shark Sciences

If science teaches us anything, it is that every answer changes what we know, as with who gets to do the science.

And every new question asks us to step once again into murky waters.

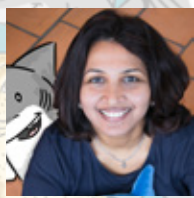
Shark toons



By Anju Sabu (@ohdakuwaqa)

SHARK AWARENESS DAY JULY 14TH

Know your sharks.



Anju Sabu is an amateur cartoonist who draws sharks because she has always found them fascinating. She is based at Chennai and Nagercoil, Tamil Nadu, India.

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Shark Gallery

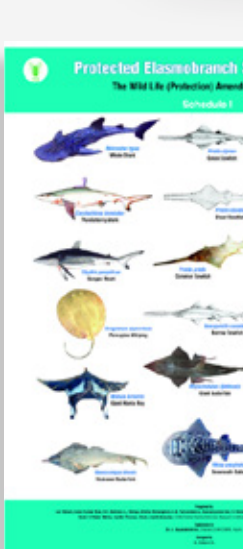
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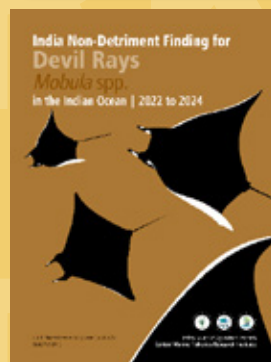
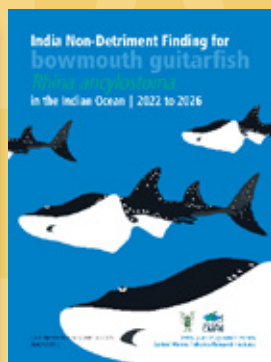
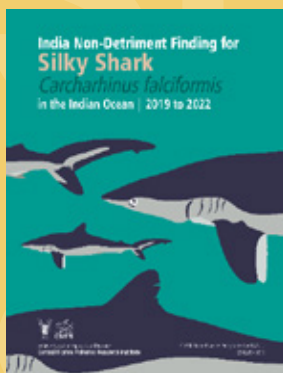
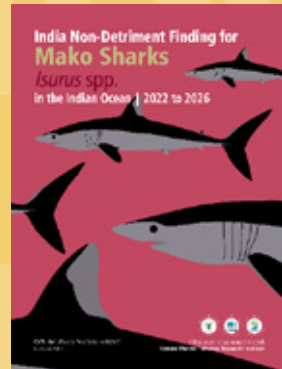
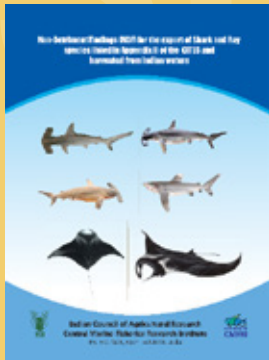
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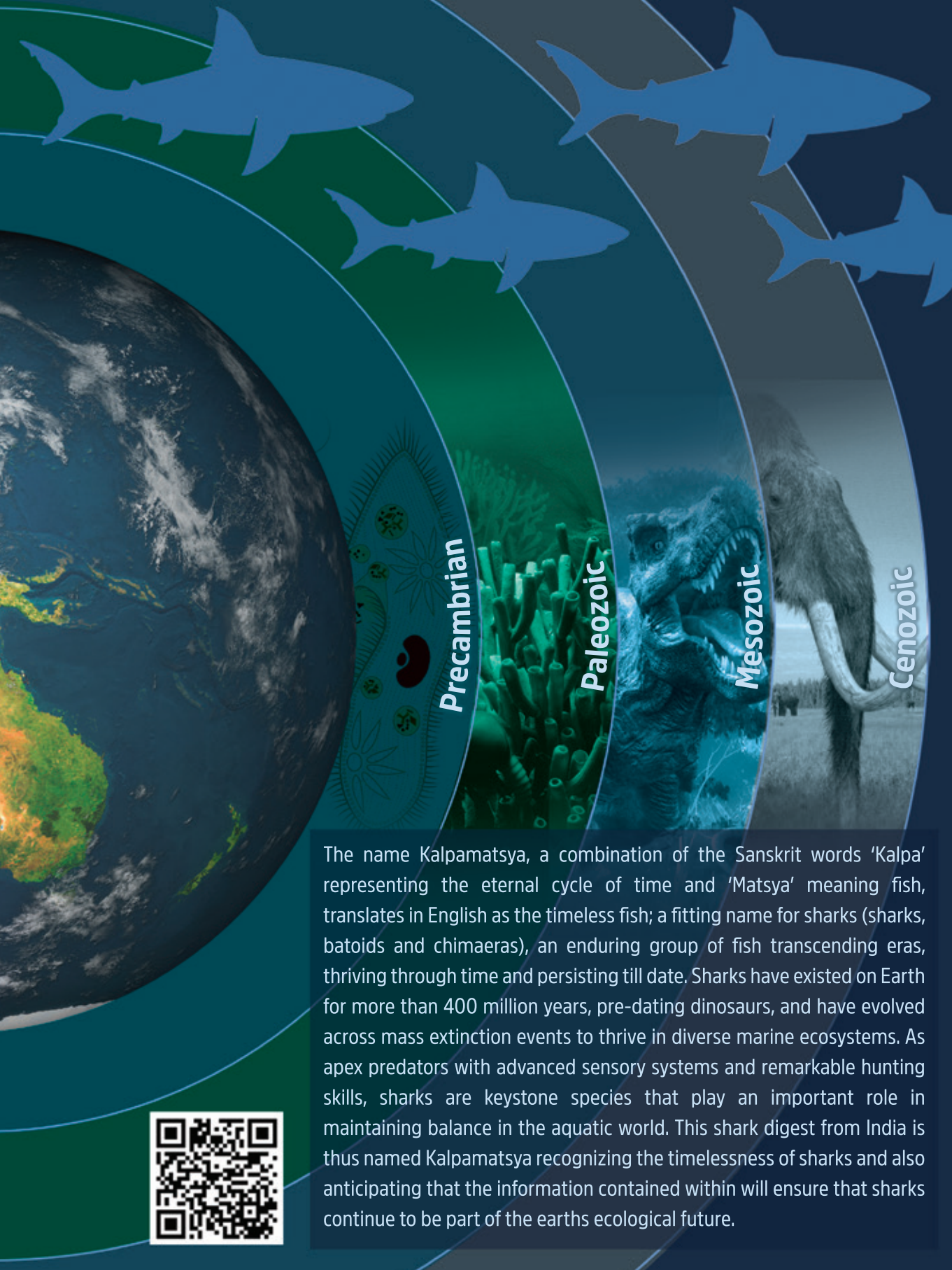


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Shark literature



<http://eprints.cmfri.org.in>



Precambrian

Paleozoic

Mesozoic

Cenozoic

The name Kalpamatsya, a combination of the Sanskrit words 'Kalpa' representing the eternal cycle of time and 'Matsya' meaning fish, translates in English as the timeless fish; a fitting name for sharks (sharks, batoids and chimaeras), an enduring group of fish transcending eras, thriving through time and persisting till date. Sharks have existed on Earth for more than 400 million years, pre-dating dinosaurs, and have evolved across mass extinction events to thrive in diverse marine ecosystems. As apex predators with advanced sensory systems and remarkable hunting skills, sharks are keystone species that play an important role in maintaining balance in the aquatic world. This shark digest from India is thus named Kalpamatsya recognizing the timelessness of sharks and also anticipating that the information contained within will ensure that sharks continue to be part of the earth's ecological future.

