



*Regional Dialogue on*  
**Conservation of Marine Mammals and Turtles:**  
**Experience sharing on meeting trade obligations**  
**by the Bay of Bengal Rim Countries**

29 August 2024 | Chennai, India

**Meeting Report**







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**Bay of Bengal Programme  
Inter-Governmental Organisation**  
91 St. Mary's Road, Chennai - 600 018, India

# Abbreviations

|                |  |
|----------------|--|
| BBNJ Agreement | Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction |
| BOBP-IGO       | Bay of Bengal Programme - Inter-Governmental Organisation  |
| CBD            | Convention on Biological Diversity   |
| CFA            | Comparability Finding Application  |
| CITES          | Convention on International Trade in Endangered Species of Wild Fauna and Flora  |
| CMS            | Convention on Migratory Species  |
| FSI            | Fishery Survey of India  |
| ICAR-CIFT      | ICAR-Central Institute of Fisheries Technology   |
| ICAR-CMFRI     | ICAR-Central Marine Fisheries Research Institute   |
| IOTC           | Indian Ocean Tuna Commission   |
| IUU            | Illegal, Unreported, and Unregulated fishing   |
| MMPA           | Marine Mammal Protection Act   |
| MPEDA          | Marine Products Export Development Authority   |
| NETFISH        | Network for Fish Quality Management & Sustainable Fishing (A society under MPEDA)  |
| NOAA           | National Oceanic and Atmospheric Administration  |
| TED            | Turtle Excluder Device   |

## Preferred Citation

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# Context

Marine mammals such as whales, dolphins and dugongs, and sea turtles play an important role in maintaining the ecological balance of marine ecosystems. While they primarily function through nutrient cycling and trophic interactions, they also serve as indicators of ecosystem health. Bycatch, defined as the unintentional capture of non-target species during fishing operations, poses a significant threat to marine mammal and sea turtle populations globally. Studies indicate that bycatch is a leading cause of human-induced mortality among marine mammals, with various fishing methods, such as trawls, gillnets and longlines, contributing to this issue.

The Marine Mammal Protection Act, 1972 (MMPA) of the United States of America (U.S.), was one of the first to address this issue by stipulating conditions for conservation of marine mammals. Similarly, Section 609 of Public Law 101-162, enacted in 1989, is a significant U.S. regulation aimed at protecting sea turtles from the harmful effects of shrimp trawling. Although they are U.S. national acts, given the scope of these acts for international cooperation, and the market power of the U.S., they are pivotal in the conservation of marine mammals and sea turtles globally.

The Marine Mammal Protection Act (MMPA) in the U.S. mandates that fish exported to the U.S. must be caught in a manner that does not cause excessive incidental mortality or serious injury to marine mammals. This law requires exporting nations to provide data on marine mammal populations and bycatch levels. To continue exporting fish to the U.S., countries must submit a 'Comparability Finding Application'. Thus, this legislation represents a significant effort by a single country to influence the conservation practices of other nations regarding fisheries and bycatch. Similarly, U.S. law under Section 609 of P.L. 101-162 dictates that shrimp and shrimp products cannot be imported into the U.S. if they are harvested using methods that harm protected sea turtles. Exporting countries must ensure that shrimp

harvesting minimizes impacts on endangered sea turtles. Countries trading with the U.S. are working to meet these standards and support the conservation of marine mammals and turtles. However, they face challenges in compliance due to the need for enhanced capacity and additional studies. These include developing marine mammal stock assessment programmes, collecting reliable data on marine mammal abundance and bycatch, and creating effective mitigation measures, all of which require significant expertise and resources.

The Bay of Bengal Rim countries need to improve their capacity and establish more comprehensive policies for marine mammal and turtle protection, as well as bycatch reduction, given the strong connection between local livelihoods and the conservation of these species.

This Regional Dialogue, hosted collaboratively by the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), the Central Marine Fisheries Research Institute of the Indian Council of Agricultural Research (ICAR-CMFRI), and the Marine Products Export Development Authority, Government of India (MPEDA), sought to address deficiencies in regulation, enforcement, engagement, and knowledge. The goal was to identify practical solutions for effectively reducing bycatch while also supporting sustainable livelihoods.

## Objectives

The broad objectives of the workshop were to

- Share information on emerging trade policies on conservation of marine mammals and sea turtles
- Share experiences from the BOB Rim countries on the national efforts towards conservation of marine mammals and turtles
- Identify challenges in meeting the standards of trade regulations; and
- Deliberate on solutions for strengthening the conservation of marine mammals and turtles

## Participants

Officials and experts from Bangladesh, Bhutan, Cambodia, India, Indonesia, Maldives, Mauritius, Myanmar, Nepal, Sri Lanka, Seychelles, Thailand and Timor-Leste. Experts from research and academic organizations; fisheries and conservation organizations.

## Expected outcomes

- Improved understanding of trade policies and their impact on conservation efforts
- Identification of specific challenges in meeting international regulations
- Increased capacity among participants in data collection and bycatch mitigation
- Appreciation of collaboration among Bay of Bengal Rim countries
- Better knowledge of practical solutions to reduce bycatch and protect marine species

## Workshop Agenda

The workshop agenda was designed to discuss the conservation of marine mammals and turtles by sharing information on emerging trade policies, exchanging experiences from Bay of Bengal Rim countries regarding national conservation efforts, identifying challenges in meeting trade regulations, and discussing solutions to strengthen conservation. Experts and officials from countries including Bangladesh, Bhutan, Cambodia, India, Indonesia, Maldives, Mauritius, Myanmar, Nepal, Sri Lanka, Seychelles, Thailand and Timor-Leste, as well as specialists from research, academic, fisheries and conservation organizations, were encouraged to share their respective countries' status on marine mammal and turtle conservation. The goal was to gain a deeper understanding of trade policies and their impacts on conservation, identify specific challenges in adhering to international regulations, enhance capacity for data collection and bycatch mitigation, foster greater appreciation for regional collaboration, and improve knowledge of practical solutions to reduce bycatch and protect marine species.



# Report

## Overview

The Regional Dialogue on “Conservation of Marine Mammals and Turtles: Experience Sharing on Meeting Trade Obligations by the Bay of Bengal Rim Countries” was held at Hotel Trident, Chennai on 28 August 2024. The discussions, covered India's experience in assessing and documenting the conservation status of these species. Key points included strategies and challenges in marine mammal and sea turtle conservation, the implications for seafood trade, and the need for enhanced knowledge sharing and capacity development. During the session, experts from various countries, including Bangladesh, Bhutan, Cambodia, Indonesia, Maldives, Mauritius, Myanmar, Nepal, Seychelles, Sri Lanka, Thailand, and Timor Leste, shared their reflections on marine mammal and sea turtle conservation. Each country presented unique insights based on their local challenges and successes. The Agenda of the Workshop is given in Annexure A and the List of Participants is given in Annexure B. Annexure C contains the moments of the event.

## Welcome and context setting

Dr. P. Krishnan, Director, BOBP-IGO in his introductory remarks addressed trade-related issues connected to the conservation of marine mammals and turtles. He emphasized the need to strengthen national laws in alignment with international conservation policies, conduct surveys, and document the stock of marine mammals and turtles in the Bay of Bengal rim countries. He encouraged all nations to learn from Indian initiatives in this area and invited them to partner with India in these efforts. Dr. Krishnan also urged representatives from the participating nations to share information on the conservation activities being carried out in their countries.



## Technical Presentations

Technical presentations were made on the topic of marine mammals and sea turtles,

highlighting the interface between national policies for conservation and international policies on trade. Experts from various countries, including Bangladesh, Cambodia, Indonesia, Maldives, Myanmar, Nepal, Seychelles, Sri Lanka, and Timor-Leste, shared their reflections following the technical presentations on strategies and experiences in conservation efforts, with participants highlighting both successes and challenges faced in their respective countries. A panel comprising Dr. K. Arulananthan, Director General, National Aquatic Resources Research and Development Agency (NARA), Sri Lanka, Dr. Grinson George, Director, ICAR-CMFRI, and Dr. M. Karthikeyan, Director, MPEDA facilitated the discussions and provided insights, linking the technical presentations with national reflections. A detailed summary of the technical presentations is given in Annexure D.

## *MPEDA: Marine mammals and sea turtles: Interface between national policies for conservation and international policies on trade*

Dr. M. Karthikeyan, Director, MPEDA, described the interface between national policies for conservation and international policies on trade in India with respect to marine mammals and sea turtles.



He explained India's efforts as an integrated effort by MPEDA, CIFT and CMFRI for conservation of turtles and marine mammals in coordination with US National Oceanic and Atmospheric Administrations (NOAA). He said that India was continuously carrying out marine mammal stock assessment, protection, conservation, mitigation and bycatch surveys. Efforts to conserve marine mammals and sea turtles included continuous data collection on population abundance and bycatch, development of new stock assessment programmes, effective implementation of national laws and Turtle Excluder Devices (TEDs) in commercial fisheries, and collaborative research on bycatch reduction devices and conservation training.

Dr. K. Arulananthan, Director General, National Aquatic Resources Research and Development Agency (NARA), Sri Lanka emphasized the critical need to protect marine mammals, highlighting their intelligence and the threats they face from pollution and bycatch. He pointed out that whales, dolphins, and sea turtles are especially abundant in the southern waters of Sri Lanka. Protecting these species is vital, as they play an essential role in providing ecosystem services and maintaining the health of marine environments.



Dr. Grinson George, Director, ICAR-CMFRI, emphasized the necessity of international cooperation for the conservation of marine mammals and turtles, given that the ocean is a global resource that transcends national borders. He highlighted the fact that India has established robust national and legal frameworks for the conservation of marine biodiversity, specifically addressing marine mammals and turtles. Key institutions such as CMFRI, MPEDA, and CIFT work together to monitor and evaluate marine mammals and turtles, implementing necessary action plans as needed. Addressing common challenges such as overfishing, habitat destruction, and climate change requires a united global approach. Collaborative efforts facilitate the sharing of information, resources, and strategies, enabling effective management of migratory routes and breeding grounds. He said that by working together, countries could develop and enforce comprehensive and coordinated conservation strategies that ensure the survival of these endangered species and the health of marine ecosystems for future generations. Dr. George urged experts and officials to provide updates on the status of marine mammal and turtle conservation efforts in their respective countries.



## **ICAR-CMFRI & ICAR-CIFT: Assessing and documenting conservation status of marine mammals and sea turtles: India's Experience**

Dr. R. Ratheesh Kumar, Scientist at ICAR-CMFRI, provided an in-depth explanation of marine mammal monitoring and assessment practices in India. To evaluate marine mammal populations within India's Exclusive Economic Zone (EEZ), boat-based surveys and standardized methodologies were employed. The line transect method was used to estimate the absolute abundance of cetacean populations based on visual sighting data. During these surveys, the study area was systematically examined along predetermined transects to ensure comprehensive sampling. When marine mammals were sighted, data was collected to calculate the perpendicular distance from the sighting to the transect line. This data helped estimate the effective width of the search area, allowing for the calculation of density, which was then extrapolated to estimate the total abundance within the entire study area. These sighting surveys provided estimates of the number of animals present in a specific area at a given time.



Currently, in the surveys, line transect sampling was conducted along parallel, stratified transects that were evenly spaced to cover the targeted area. The sighting distances were analyzed to fit models, with the half-normal distribution being the most commonly used. This process led to a prediction function that estimated the probability of sightings within each stratum. By combining these probabilities with the total area, an estimate of the cetacean population was made. The surveys were divided into two strata: coastal and offshore. Data from these surveys were combined to generate zonal and national estimates. Coastal surveys utilized commercial fishing vessels, while offshore surveys were conducted using FSI vessels.

Dr. K. K. Prajith Senior scientist at the ICAR-CIFT spoke on the technological efforts in Indian fisheries to save marine mammals and sea turtles. He described the creation, evolution, and current state of use of turtle excluder devices in Indian fisheries and discussed the state of the nation's marine mammal mitigation initiatives. Along with technological advancements and conservation efforts, he explored the social and religious significance of marine megafauna as well as the modes of conservation.



### **Reflections from National Experts: Conservation of Marine Mammals and Turtles: Status and Action Plans**

Representatives from Bangladesh, Sri Lanka, Maldives, Myanmar, Cambodia, Nepal, Timor Leste and Indonesia gave an account of the efforts they are taking to conserve marine mammals and turtles.

The representative from Bangladesh, Mr. Shoukot Kabir Chowdhury, Senior Assistant Director, Marine Fisheries Office, Ministry of Fisheries & Livestock, mentioned that in 1952 itself the country had systems to conserve marine mammals under the Marine Mammals Protection Act, USA. From time to time, based on the need, the country has made amendments to its existing legal instruments for ensuring conservation of marine mammals and turtles. The country has ratified the BBNJ Agreement. Bangladesh has achieved significant conservation milestones, including the creation of three Wildlife Sanctuaries for Freshwater Dolphins in the Sundarbans and the country's first marine protected area in the Swatch-of-No-Ground submarine canyon and surrounding estuarine waters. The Forest Department of Bangladesh is providing technical support to implement SMART patrols throughout the Sundarbans.



Ms. Bopreang Ken, Director, Department of Biodiversity, Ministry of Environment, representing Cambodia, summarized the conservation efforts taken by the country to protect marine mammals



and turtles. Although Cambodia is not yet party to the BBNJ agreement, the conservation of marine wildlife, including endangered sea turtles and marine mammals, is addressed under the country's fishery law, which includes a specific action plan running from 2016 to 2026 that outlines strategies for reducing bycatch, rehabilitating and protecting species, and raising awareness. In 2016, Marine Conservation Cambodia (MCC), in partnership with the Fisheries Administration of the Royal Government of Cambodia, initiated the Cambodian Marine Mammal Conservation Project. Additionally, the plan encompasses measures for aquaculture and animal husbandry and includes capacity-building programs for marine fishermen to enhance species protection. The Marine Mammal Conservation Project is a research-driven and community-focused initiative aimed at protecting the country's endangered marine mammals. Currently, the project primarily concentrates on the Irrawaddy dolphins and dugongs in the Kep Archipelago, with a long-term commitment to their conservation. As of 2022, the project had expanded into the neighbouring province of Kampot and now also includes the Indo-Pacific Humpback Dolphins in its research efforts.

Mr. Muhammad Bintang Tommy, of Ministry of Foreign Affairs - Legal Affairs and Economic Treaties, Jakarta, representing Indonesia, stated that Indonesia is currently aligning their policy with the CITES



which listed many species of marine mammals and sea turtles. He said that the country was recognizing and implementing the Convention by generating the law and regulations, as well as mechanisms to protect the endangered species. He said that there were cases of IUU Fishing by unknown entities from other countries and most of the policy and

regulations made were currently to combat IUU Fishing. Hence, the priorities and alignments would be to protect marine mammals and sea turtles from IUU Fishing and Illegal Trade.

Ms. Hawwa Raufath Nizar, Fisheries Officer at the Ministry of Fisheries and Ocean Resources in the Maldives, spoke on behalf of the work done by the Ministry of Climate Change, Environment and Energy, Maldives. She



commented that the country is already well-sensitized to marine conservation issues. She explained that the country had a long history of conservation and management measures as pertaining to marine mammals and sea turtle species. The harvest, consumption and trade bans on whales, cetaceans and turtles have been in place in the country for several decades. The Maldives primarily uses pole-and-line and other surface-based line fishing methods, which have relatively minor bycatch incidence. The country also promotes regional cooperation in this regard as it is a signatory to the Indian Ocean–South-East Asian Marine Turtle Memorandum of Understanding and a member of the Northern Indian Ocean Marine Turtle Task Force. In her concluding remarks, she noted that all currently operational Maldivian fisheries are categorized as "exempt" in the NOAA list of Foreign Fisheries due to there being no known or a remote likelihood of marine mammal bycatch within those fisheries. The country is therefore exempt from instituting a regulatory programme in this regard.

Representing Myanmar, Mr. Tint Khaing, Director, Forest Department, Ministry of Natural Resources and Environment Conservation, highlighted the country's stand on conservation of sea turtles and marine mammals. The country began its biodiversity conservation efforts in 1980 and became a member of the Indian Ocean and South Indian Ocean networks in



2001. Myanmar has a coastline extending over 2,300 kilometres, rich in marine and coastal resources, including mangroves, beaches, forests, and island ecosystems. The country's marine biodiversity includes over 7,000 species of marine organisms. Since 1994, two marine mammals have been protected under Myanmar's Protection of Wildlife and Conservation of Natural Areas Law, 2018. Myanmar is home to five species of marine turtles, all of which are listed as threatened by the International Union for Conservation of Nature (IUCN). The hawksbill turtle is critically endangered, while the green and loggerhead turtles are endangered. Myanmar's non-marine fishery laws from the 1990s prohibit mechanized fishing within five miles of the shore. Additionally, non-governmental organizations (INGOs and NGOs) such as the BCS, Wildlife Conservation Society (WCS), Fauna & Flora International (FFI), and the Institute of Whale Coast are actively involved in marine management and sea turtle conservation efforts. To support sea turtle conservation, the Department of Fisheries implements two methods of natural hatching: in situ (at the nesting site) and ex situ (in prepared hatcheries).

Monitoring systems are established at both national and regional levels. Since 2005, fishing boats have been regulated under CMS, requiring them to adhere to specific regulations. Foreign fishing is prohibited, and the number of permits for light-based fishing is being reduced annually, with alternative methods promoted. Sustainable sea turtle conservation in Myanmar relies on the interest and participation of local communities, particularly those in coastal areas. Education and awareness are crucial. The Ministry of Livestock, Fisheries, and Rural Development has distributed pamphlets to raise public awareness, and educational programs are promoted through newspapers, magazines, radio, and television. Efforts are ongoing to develop a national marine conservation plan, which includes marine protected areas, waste management, and ecosystem-specific conservation. Research is vital for improving management practices and enhancing local livelihoods. Key priority areas for marine conservation and collaboration include

Integrated coastal resource management for better management of marine coastal pollution, developing sustainable fisheries, community-based coastal risk management, marine aquaculture and to promote ecosystem-specific conservation (e.g., coral reefs, seagrass) and species-specific conservation (e.g., sharks and rays, marine turtles, crocodiles). These priorities aim to address both ecological and socio-economic aspects of marine conservation in Myanmar.

Ms. J.P. I. Swarnalatha, Deputy Director, Ministry of Fisheries, Sri Lanka, explained to the forum that marine mammal resources are considered highly valuable, and their harvest is strictly prohibited under the Marine Life Act and associated regulations in the country. This legal protection underscores the commitment to preserving these species and maintaining the health of marine ecosystems. Oceanwell was at the forefront of marine mammal conservation, dedicating significant efforts to protect these animals through various initiatives and research programs. Their work was crucial in advancing understanding and safeguarding the well-being of marine mammal populations. To promote ecotourism and raise awareness, a whale-watching program had been established. This initiative not only provides opportunities for observing whales in their natural habitat but also fosters greater appreciation for marine life and its conservation. Current protection efforts are also focused on dugongs, with ongoing measures aimed at ensuring their survival and addressing the specific threats they face. These efforts reflect a broader commitment to conserving marine biodiversity and protecting vulnerable species.

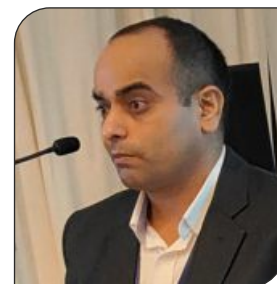


Mr. Francisco Vital Ornai, Director, Director Legal Affairs for the Ministry of Foreign Affairs and Cooperation of Timor-Leste, explained that they have a national fisheries policy. They have to reinforce the existing policies for strengthening conservation of marine mammals and turtles. In the future,



Timor Leste wants to learn and adopt technology and efficient methods from other countries that are successful in this path.

Mr. Rishi Ram Dhakal, Ecologist, Ministry of Forest and Environment, Department of National Parks and Wildlife Conservation, NEPAL expressed the status of Nepal's conservation of marine mammals and turtles. Dolphins are protected under several key agreements and laws, including CITES, the CBD, the Forest Act, the Wildlife Act, and the Aquatic Animal Protection Act, as well as various trade-related regulations. Nepal, a member of several Southeast Asian networks for information sharing and combating wildlife crimes, has developed a Dolphin Conservation Action Plan that emphasizes regional cooperation and collaboration.



The presentations were followed by a discussion. Key recommendations focused on enhancing the conservation efforts for marine mammals and turtles in the Bay of Bengal region. This could be achieved by strengthening regional collaboration, enhancing compliance with international regulations, capacity building and training, conducting regular stock assessments, promoting sustainable fishing practices, leveraging legal frameworks, community engagement, and focusing on habitat protection. The forum emphasized the need for regional collaboration, potentially led by India, to enhance research and conservation efforts. It proposed establishing a network of research organizations and management institutions across the region to strengthen the conservation of marine mammals and turtles while supporting sustainable fisheries.



## Closing Remarks and Way Forward

Dr. P. Krishnan, Director of BOBP-IGO, Chennai, thanked the BOBP Rim countries for sharing the status of actions taken by the different countries and future plans for conserving marine mammals and turtles. He expressed hope that the countries would continue networking and collaborating on technology transfer and sharing successful experiences to achieve effective conservation of marine mammals and turtles.

The coastal geography, along with the diversity and population density of marine mammal species, varies uniquely across each country in the Bay of Bengal region, requiring bespoke conservation strategies to address these differences. The valuable insights from this session, shared through case studies, models,

and successful policy frameworks, can be incorporated by countries that have not yet initiated interventions in this area. Dr. Krishnan emphasized that most delegate countries had adequate legal instruments, with provisions aligned for conservation of marine mammals and turtles, and what is required is prioritization along with action plans focusing on regional requirements. He suggested that existing national and international policies and legal frameworks should be reinforced to achieve effective conservation of marine mammals through regular stock assessments and impact studies by the respective countries.



## Concerns of Experts on Compliance-driven Conservation Action

Many coastal countries are already having regulations for conservation of marine mammals and turtles. Implementation of MMPA gives a new dimension to the perspectives of the countries. Filing Comparability Finding Application (CFA) requires two sets of data by adopting the methodology followed by the US: estimates on abundance and bycatch. This requires dedicated, long duration sea surveys and extensive bycatch monitoring. Technical expertise as well as detailed planning, and financial and policy support are also required. Developing countries with limited resources and capacity will find it difficult to execute this highly demanding program.

The fisheries of developing south and southeast Asian countries have multispecies, mixed and multi-gear fisheries, and a large fisheries-dependent population. There are technical issues in reducing bycatch in the tropical fisheries. For example, a large proportion of bycatch of sea turtles come from the gillnet fishery, whereas Turtle Excluder Device (TED) pertains to trawl fishery. The bycatch mitigation practices have to be different for the gear types.

It was noted that the conservation initiatives taken in response to MMPA requirements is a case of one country driving the policy and strategies of marine megafauna conservation in the world oceans. Such reactionary conservation efforts solely depend on the trigger and are not sustainable. While a few countries would be sensitized on the conservation approaches of megamammals, unless the countries grounded their own actions based on their conservation priorities and realities, the goal of conservation would not be achieved effectively. A location-specific and demand-driven strategy, based on a well-established conservation goal, with effective action plan and implementation will not only offer a sustainable conservation solution, but also take care of overcoming the trade barriers as well.

Residual questions on the MMPA-driven conservation actions

- Is it effective to conserve the megafauna by adopting MMPA? Is there sufficient evidence to show that the population has increased?
- If the megafauna is protected with great alacrity, what will be the impact on the ecosystem?
- A few concerns on the methodology side were identified as under:
  - The Potential Biological Removal (PBR) is supposed to be 0.1 to 1.0%. How was the PBR apportioned to different gear types?
  - Estimating total mortality (natural mortality + fishing and other human caused mortalities) is uncertain.
  - PBR management cannot guarantee achieving MMPA goal when natural mortality increases, with no relation to bycatch.

## Recommendations

### ***Implementing Standardized Marine Mammal Stock Assessment Methods***

Adopting standardized stock assessment methods based on regional consensus and extending these methods to identify spatial structures for marine mammal stock assessments could enhance our understanding and conservation efforts for these vital resources. The framework would facilitate a comprehensive evaluation of marine mammal populations, ensuring that conservation strategies are based on robust scientific data. The integration of diverse methodologies and datasets, such as remote sensing, acoustic monitoring, and genetic studies, could further refine our understanding of marine mammal distributions and population dynamics. Additionally, fostering international collaboration and data sharing would promote a cohesive approach to marine mammal conservation, addressing challenges such as bycatch reduction and habitat protection. By leveraging the strengths and expertise of various countries and organizations, a more nuanced and effective strategy for marine mammal conservation can be developed. This approach would improve stock assessment accuracy and enhance the implementation of sustainable management practices, ultimately contributing to the preservation of marine biodiversity and the health of our oceans.

### ***Enhancing Compliance with International Regulations for Marine Mammal and Turtle Protection***

To strengthen marine conservation in the Bay of Bengal Rim countries, it is recommended that regulatory programs that align with international standards for marine mammal and sea turtle protection be developed, with a focus on reducing bycatch. This includes promoting bycatch reduction technologies, such as TEDs, Dolphin Wall Nets, and pingers in trawl fisheries, to minimize incidental captures. Furthermore, engaging in initiatives like NOAA-CFA would help the region contribute economically to global fisheries while sustainably conserving marine mammal species, potentially gaining exemptions or enablers for fisheries.

### ***Collaborative Marine Mammal Surveys for Bay of Bengal Rim Countries***

The workshop recommended adopting an integrated approach that synthesizes visual,

genetic, biological, and acoustic data into modelled products and decision-support tools for effective conservation. This approach includes field-based research, such as vessel and aerial surveys (using drones), capture-mark-recapture sampling, passive acoustic monitoring, satellite telemetry, tissue collection, water sampling, and environmental data collection. In laboratories, techniques like molecular genetics, genomics, ecological DNA, stable isotope analysis, skeletochronology, near-infrared spectroscopy, and diagnostic health assessments can be employed. By applying both novel and established analytical tools, these methodologies will help answer complex research and management questions, ensuring effective conservation strategies for the region.

### ***Citizen Science Approach, Capacity Building, and Establishing a Stranding Network***

Building the capacity of officials, researchers, and conservationists is critical for the success of conservation efforts. Training programs must focus on species identification, rescue operations, and bycatch mitigation techniques. Establishing a formal stranding analysis network involving government bodies, voluntary organizations, and fishers will ensure a coordinated response to marine mammal strandings. This network, supported by laboratory resources and veterinary expertise, will facilitate timely rescues and provide valuable data for improving conservation methods in both regional and global contexts.

### ***Developing a Plan of Action/Framework with Networking and Policy Development***

Collaborative efforts among participating countries and input from experts are essential for advancing marine mammal stock and bycatch estimations, as well as for conservation measures. Establishing a framework that encompasses assessments through sightings, strandings, and bycatch estimates, guided by a shared vision and underpinned by epoch-scaled datasets, is crucial for enabling ecosystem-based approaches. A coordinated plan of action, supported by networking among researchers, government officials, conservationists, and local communities, is essential for marine mammal conservation. This plan should include the development of policies that address critical issues, such as habitat protection, bycatch reduction, and pollution

control. Incentive-based approaches and regulatory enforcement will be vital in achieving long-term goals.

### ***Evidence-Based Scientific Inputs in Conservation Planning***

Conservation strategies must be grounded in scientific research to ensure their effectiveness. Identifying critical habitats for marine mammals and turtles and creating protected areas in breeding, feeding, and migratory zones are essential steps. National species action plans should outline conservation goals for vulnerable species. Additionally, bycatch mitigation measures, such as the mandatory use of TEDs and other gear modifications, should be strictly enforced to minimize incidental captures of marine species.

## **Way Forward**

The protection of marine mammals and sea turtles in the Bay of Bengal Rim countries requires a coordinated, multi-faceted approach that transcends national boundaries. These species are integral to marine biodiversity and ecosystem health, and their conservation is crucial for sustainable fisheries and ocean health. Each country in the Bay of Bengal Rim must develop and implement comprehensive, country-specific action plans for marine mammal and sea turtle conservation in alignment with international frameworks like the Convention on Biological Diversity (CBD) and the Indian Ocean Tuna Commission (IOTC). These plans should focus on minimizing bycatch, protecting critical habitats, and mitigating threats such as pollution and climate change. Collaborative regional efforts under BOBP-IGO should aim to ensure coordinated action across borders, with regular assessments to evaluate progress and refine strategies as necessary.

### ***Policy Reinforcement and Integration***

Robust enforcement of existing conservation policies is critical for the region, where illegal, unreported, and unregulated (IUU) fishing often exacerbates the threats to marine mammals and sea turtles. Countries should strengthen their conservation policies and enforcement mechanisms and actively update laws to reflect advances in conservation technologies and best practices. Integration of marine conservation into national development agendas will be vital to ensure sustained

political will and to protect these species effectively, balancing environmental goals with economic growth.

### ***Technology Transfer and Research Cooperation***

The transfer of advanced technologies and shared research efforts among Bay of Bengal Rim countries will be pivotal. For instance, the adoption of bycatch reduction technologies like TEDs, pingers, and Dolphin Wall Nets across trawl fisheries should be expanded. Countries with advanced marine conservation programs can provide technical expertise, offer training workshops, and share knowledge on innovative bycatch mitigation technologies and habitat monitoring methods. Collaborative research projects that span the region will enhance data sharing and build capacity for more effective conservation efforts.

### ***Funding and Resource Mobilization***

Securing financial and technical resources remains a challenge for many countries in the Bay of Bengal Rim. International organizations such as the World Bank, the Global Environment Facility (GEF), and development agencies should be engaged to provide funding for conservation initiatives, particularly for capacity building, habitat restoration, and the adoption of new technologies. Governments should also allocate dedicated national budgets for conservation, ensuring that fisheries management and marine protection are sustainably financed. BOBP-IGO can act as a facilitator to mobilize resources and coordinate funding efforts at a regional level.

### ***Sustainability and Livelihoods***

Promoting sustainable fishing practices through the use of bycatch reduction devices, reducing overfishing, and protecting critical habitats will not only conserve marine mammals and sea turtles but also ensure long-term fisheries sustainability. Offering alternative livelihood opportunities, such as eco-tourism, mariculture, and other sustainable marine activities, can help reduce pressure on fishing practices that threaten vulnerable species. Community-based conservation programs, supported by governments and international organizations, can empower local stakeholders to actively participate in conservation efforts while maintaining their economic well-being.

## Appendix A: Agenda and Timetable

| Time (hrs)  | Session Details   | Keynote Speaker   |
|-------------|---|---|
| 1800 - 1810 | Welcome & Context Setting   | BOBP-IGO  |
| 1810 - 1950 | Marine mammals and sea turtles: Interface between national policies for conservation and international policies on trade  | MPEDA   |
|             | Assessing and documenting conservation status of marine mammals and sea turtles: India's Experience   | MPEDA   |
|             | Assessing and documenting conservation status of marine mammals and sea turtles: India's Experience   | ICAR-CMFRI  |
|             | <b>Moderation:</b><br><b>Dr. K. Arulanathan</b> , <i>Director General, NARA, Sri Lanka</i><br><b>Dr. Grinson George</b> , <i>Director, CMFRI</i><br><b>Dr. M. Karthikeyan</b> , <i>Director, MPEDA</i><br><b>Discussion Points</b><br>Strategies and experiences in conservation of marine mammals and sea turtles<br>Challenges in meeting the standards of conservation & implications in seafood trade<br>Opportunities for knowledge sharing and capacity development<br>(4-5 minutes intervention from each country) | Reflections of experts from <ul style="list-style-type: none"> <li>• Bangladesh</li> <li>• Cambodia</li> <li>• Indonesia</li> <li>• Maldives</li> <li>• Myanmar</li> <li>• Nepal</li> <li>• Seychelles</li> <li>• Sri Lanka</li> <li>• Timor-Leste</li> </ul> |
| 1950 - 2000 | Closing Remarks & Way forward   | BOBP-IGO  |
| 2000        | Networking Dinner   |   |

## Appendix B: List of Participants

| No. | Country    | Participant Name            | Designation and contact details   |
|-----|------------|-----------------------------|---|
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## Appendix C: Photographs from the Event







## Appendix D: Summary of Technical Presentations

### Marine Mammals and Turtles: Interface Between National Policies for Conservation and International Policies on Trade

**Dr. M. Karthikeyan, Director, MPEDA, Dr. Prajith K K, ICAR-CIFT and Dr. R.Ratheesh, ICAR-CMFRI**

#### Assessing and documenting conservation status of marine mammals and sea turtles: India's experience

Conservation of mammals and turtles has been a priority in India and the nation has been part of international treaties aligned with similar motives, and it also has an effective national legal framework for the same. On the international front, India is a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 1973; the Convention on the Conservation of Migratory Species of Wild Animals (CMS) 1979; and the United Nations Convention on the Law of the Sea (UNCLOS) 1982.

India's national efforts in conserving marine mammals and turtles are done with the leverage of national acts such as the Territorial Waters, Continental Shelf, EEZ, and Other Maritime Zones Act (MZA), 1976; the Coast Guard Act (CGA), 1978; the Environment Protection Act (EPA) 1986; the Wildlife Protection Act (WLP) 1972; the Biological Diversity Act 2002; and the Marine Fisheries Regulation Acts (MFRA) of coastal states. To manage and resolve issues concerning the trade of seafood products to the U.S. the country needs to follow the Marine Mammals Protection Act (MMPA) and TED implementation in trawl gears under Section 609 of US Public Law 101-162 of USA.

#### Protection of marine mammals and turtles in India

Marine mammals in India are protected by Schedule I & II of the WLP, 1972 which is strictly implemented with penal action (imprisonment and fine) on defaulters. MFRAs of the coastal states have been amended with strict measures to conserve marine resources such as the compulsory requirement of TED in trawl nets. The Marine Product Export Development Authority Act, 1972 prohibits the

export of all forms of marine turtles, including their parts and products.

In addition, Indian fishers protect turtles due to cultural connections. Matsya Mataji temple (Whale temple) of Gujarat points to the connection between marine animals and the local population in India. In this temple, Whale bones have been worshipped for over 300 years. Whales are worshipped along the north west coast of India and many from the fishermen community take precautions to conserve and protect them.

A number of programmes have been implemented in India to protect sea turtles. The scheme of conservation of sea turtles in Bhitarkanika Sanctuary 1975 by the Government of Odisha, efforts by 'Operation Oliva' mission launched by the Indian Coast Guard and the 'Sea Turtle Research Centre' in Odisha, etc. are some regional efforts undertaken for conservation of turtles while the National Marine Turtle Action Plan is being implemented by the Ministry of Environment, Forest & Climate Change, GoI (2021-2026).

Mitigating measures have been developed by research institutes like ICAR-CIFT which also regularly conduct awareness programmes among stakeholders. DoF, GoI has assigned FSI to conduct the Marine Mammal Stock Assessment and bycatch survey in collaboration with CMFRI, CIFT & MPEDA-NETFISH. The nation submits a status report of efforts being taken up on the protection of marine mammals from time to time and is in regular coordination with NOAA.

To provide necessary scientific suggestions for the protection of sea turtles, an Expert Scientific Panel (ESP) was appointed by the Government of India in 1998. The ESP provided critical recommendations for the protection of sea turtles and the reduction of their incidental mortality in fishing operations. The two key recommendations from the ESP were:

**Declaration of Mass Nesting Areas as Marine Sanctuaries:** This recommendation aimed to protect important nesting sites by designating them as marine sanctuaries. By doing so, it sought to safeguard these areas from human activities that could negatively impact sea turtles.

**Mandatory Implementation of Turtle Excluder Devices (TEDs):** TEDs are devices installed in trawlers, which allow safe escape of sea turtles trapped inside the net. The ESP recommended mandatory implementation of TEDs in all mechanized trawlers operating in specific areas and periods where incidental turtle mortality was recorded. This measure was intended to reduce the bycatch and accidental death of sea turtles in fishing operations.

### **The ESP identified specific regions and timeframes where these measures should be applied:**

- Entire Coast of Odisha: From November to April.
- Coast of Purba Medinipur (east Midnapore) District in West Bengal: From December to March.
- Coast of Srikakulam, Vizianagaram, Visakhapatnam, and East Godavari districts in Andhra Pradesh: From November to April.
- Coast of Nagapattinam, Tuticorin, Ramanathapuram, and Tirunelveli districts in Tamil Nadu: From December to April.
- Coast of Puducherry: Excluding the areas off the coast of Mahe, Karaikal, and Yanam, from December to April.
- Coast of Kollam and Trivandrum Districts in Kerala: From December to March.

These recommendations were designed to address the issues of sea turtle mortality due to fishing practices and to ensure the protection of key nesting areas along India's coastline. To facilitate these measures, MPEDA was given the task of developing and promoting TEDs. The design and development of TEDs were managed by CIFT, ensuring that the devices met the necessary specifications to effectively reduce sea turtle bycatch in fishing operations. This comprehensive approach aimed to protect crucial sea turtle habitats and reduce incidental catch across key regions along India's coast.

### **Key species of marine turtle in Indian coastal waters**

The Indian coastal waters are home to five key species of marine turtles, each with distinct ecological roles and conservation needs. These species are:

- Olive Ridley Turtle (*Lepidochelys olivacea*)
- Loggerhead Turtle (*Caretta caretta*)
- Leatherback Turtle (*Dermochelys coriacea*)
- Hawksbill Turtle (*Eretmochelys imbricata*)
- Green Turtle (*Chelonia mydas*)

Recognizing the critical importance of these species and the threats they face, the Government of India has prioritized their conservation. All five species are listed under Schedule I of the WLP, 1972. This inclusion in Schedule I, as amended in September 1977, provides them with the highest level of legal protection in India, prohibiting their hunting, trade, and other forms of exploitation. This legal

#### **Box 1: Compliance & challenges**

- Incidental capture of marine mammals and sea turtles in fishing gear.
- Continuous collection of data related to marine mammal population abundance, mortality data, injury and bycatch limit.
- Dedicated research to develop new marine mammal stock assessment programmes, and collect robust scientific data on marine mammal abundance, bycatch and mitigation measures.
- Effective implementation of national law to fulfill the specific conservation measures imposed by the importing countries.
- Effective implementation of TED in commercial shrimp trawlers to minimize the impact on endangered sea turtle populations.
- Study on the effectiveness of bycatch Reduction Devices such as Dolphin Wall Net and pingers to conserve marine mammal populations.
- Capacity building training on conservation of marine mammals and sea turtles.
- Collaborative efforts of various agencies for undertaking the conservation of marine mammals and sea turtles.

status underscores the commitment to preserving these species and their habitats, ensuring their continued survival in the Indian Ocean region.

### **Action taken by India on Marine Mammal Protection Act (MMPA) of USA**

The National Marine Fisheries Service (NMFS) of the U.S. has assessed the overall risk of marine mammal bycatch in Indian fisheries as 'High'. To facilitate effective implementation, MMPA provided a 5-year exemption period, allowing foreign harvesting nations time to develop regulatory programs that are comparable in effectiveness to those in the U.S. and to apply for comparability findings for their fisheries. This regulation was to take effect on January 1, 2023, meaning that from this date, imports from fisheries identified as harmful to marine mammal populations would be prohibited in the U.S.

For India, in 2019, MPEDA submitted the progress report to NOAA portal in consultation with scientific institutes such as CMFRI, FSI, CIFT, Wildlife Department, State Fisheries Departments and Sea food Exporters Association of India (SEAI). Subsequently, to satisfy the requirements of MMPA, MPEDA Initiated Marine Mammal stock assessment with the support of CMFRI, CIFT, FSI and MPEDA-NETFISH in conducting coastal survey, offshore survey and bycatch survey. A Standing Committee was formed to finalize the findings of the stock assessment study. In this connection, India has submitted a 'Comparability Finding Application' (CFA) report to the USA, following NOAA's standards. The report was compiled by MPEDA along with CMFRI and CIFT. The CFA contains five parts (Box 2). The Comparability Finding Application (CFA) was submitted to NOAA in 2021. NOAA started reviewing India's CFA and requested clarifications. MPEDA responded to NOAA in 2022 in consultation with other agencies and is currently waiting for a finalized report from NOAA.

### **Action taken by India on TED requirement of USA**

MPEDA in collaboration with CIFT, has undertaken a systematic initiative to optimize the Turtle Excluder Device (TED) in accordance with stringent NOAA technical requirements. This collaborative endeavor commenced with the participation of Indian officials in a

#### **Box 2: Parts of Comparability Finding Application**

- Part A: Fishery information Question on Exempt fisheries (India's Exempt Fisheries: 03 Nos)
- Part B: Update fisheries information Adding or Editing a Fishery in the List of Foreign Fisheries (LOFF) (India's Export fisheries: 12 Nos)
- Part C: Update Marine Mammals population and bycatch limits information (Stock abundance estimates, abundance surveys for each species, and calculate the bycatch limit.)
- Part D: Nation's regulatory program regarding marine mammal conservation and Management.
- Part E: Nation's General Fisheries Management Regulations protection, conservation, and mitigation is being done continuously.

comprehensive TED dive evaluation conducted by NOAA in June 2022 at Panama City, USA. Subsequently, CIFT embarked on the fabrication of TED prototypes adhering to NOAA specifications, followed by successful field trials that garnered significant appreciation from NOAA representatives.

To further strengthen this international collaboration, NOAA officials visited India in February 2024 to provide hands-on training and technical support to their Indian counterparts. This culminated in a specialized workshop where two distinct TED designs were finalized, specifically tailored to suit Indian fishing conditions. Additionally, a dedicated team of personnel was trained to undertake comprehensive awareness campaigns among stakeholders, emphasizing the critical importance of TED usage. Notably, one of these designs, proven effective in enabling the escape of sea turtles accidentally caught during fishing operations, has received official approval from NOAA for implementation in India.

The focus of this initiative now shifts to the promotion of widespread adoption of TEDs throughout the Indian fishing industry. To achieve this objective, extensive field demonstrations will be conducted in all maritime states of India, with the overarching

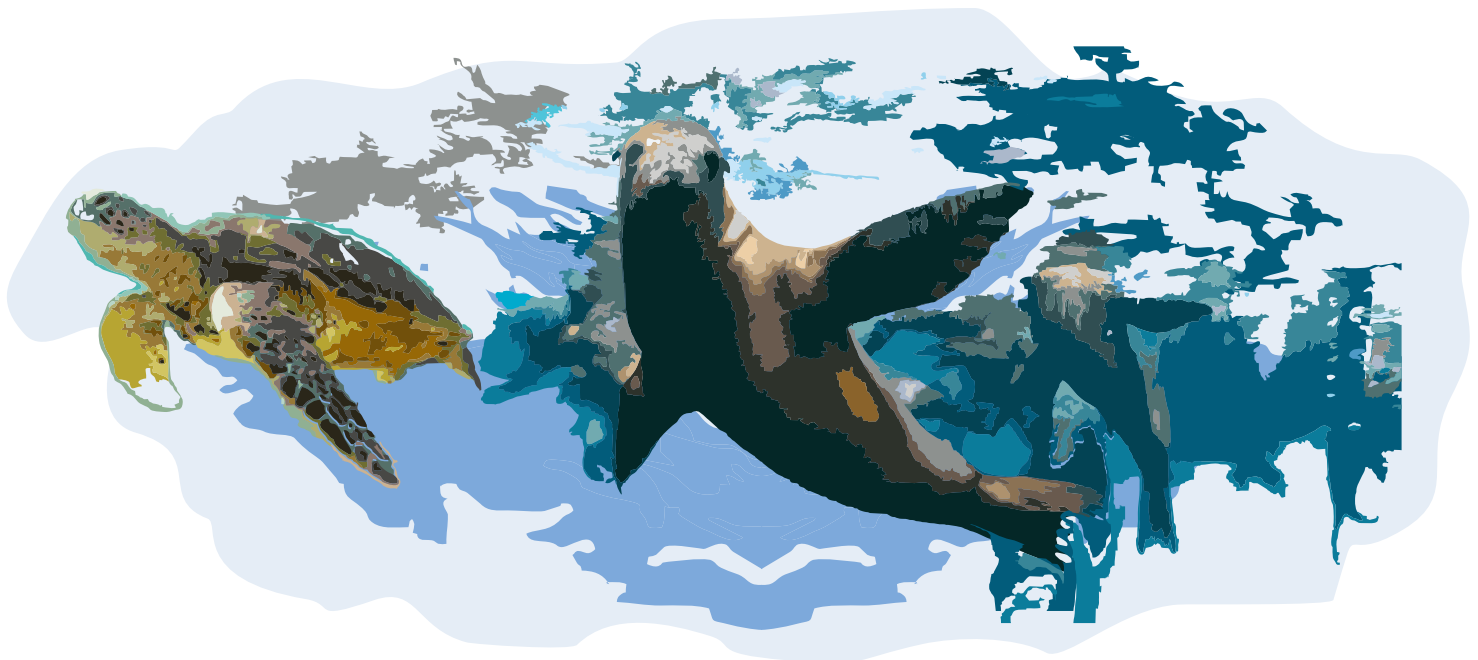
goal of ensuring the proper installation and utilization of TEDs in every trawler operating in Indian waters. This comprehensive approach is expected to result in a significant reduction in sea turtle mortality, thereby contributing to the preservation and protection of these vulnerable marine creatures.

### Marine Mammal Stock Assessment in Indian EEZ

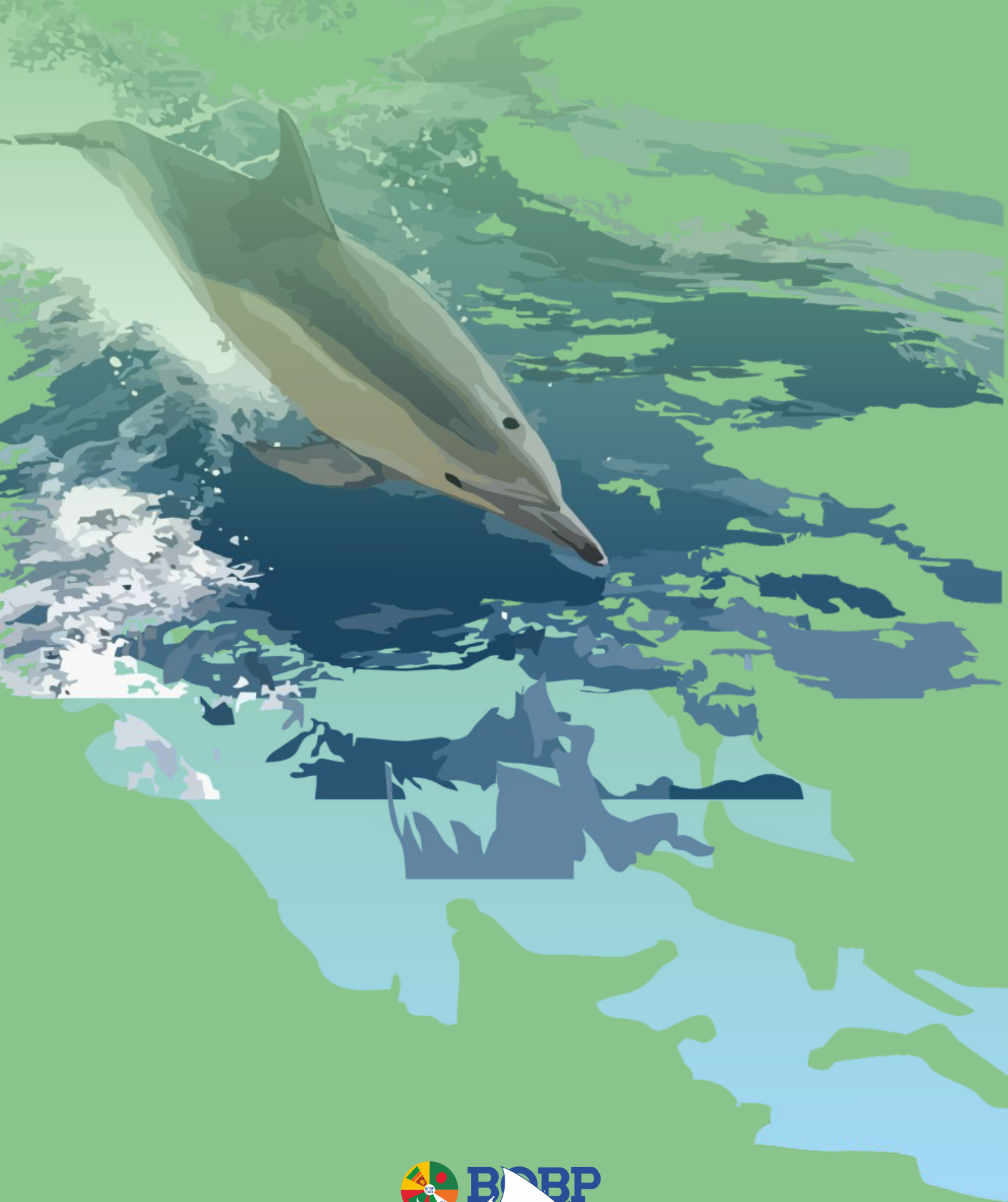
The Department of Fisheries, Government of India, has assigned the Fishery Survey of India (FSI) to conduct the Marine Mammal Stock Assessment and bycatch survey. This project is being carried out in collaboration with the CMFRI, CIFT, and MPEDA-NETFISH. The primary aim of this initiative is to assess the population (stock) of marine mammals along the Indian coast and offshore areas and to evaluate the extent of bycatch, focusing on marine mammals and sea turtles. The methodology employed for the marine mammal stock assessment involves visual surveys. During these surveys, researchers sight marine mammals at the sea surface using binoculars and record critical information such as distance and angle of the sighted animals. Photographs are taken to ensure accurate species identification. Bycatch surveys are conducted to assess incidental catches of marine mammals and sea turtles during fishing activities where interviews are held with fishermen where they report any interaction their fishing gear might have had with marine mammals or sea turtles. The objective is to gather gear-specific data, which will help researchers understand the frequency and types of bycatches occurring in various fisheries.

According to the latest CFA report, the project has yielded significant results. In total, 32 marine mammal species have been recorded from Indian waters. The abundance, bycatch, and bycatch limits for 22 marine mammal species have been estimated for the first time in Indian waters. Key findings of the report indicate that there is no bycatch observed for 7 of the species surveyed. For the other MM species, bycatch levels were within the prescribed limits for all fisheries that are currently eligible for export, as listed by the CFA. These findings mark an important milestone in marine conservation efforts, as they provide a baseline for managing and conserving marine mammal populations.

More recently, a joint research project focusing on the stock assessment of marine mammals is currently underway. This project is supported by the MPEDA, in partnership with the FSI, CMFRI, and CIFT. As part of the efforts to mitigate bycatch and protect endangered marine mammal species, India has also developed trained personnel to demonstrate the use of TEDs to fishermen. Field demonstrations are being conducted across all maritime states, raising awareness among the fishing community about the importance of using these devices. This collaborative research and conservation initiative are expected to improve the long-term management of marine mammal populations and ensure sustainable fisheries practices, aligning with global efforts to protect vulnerable marine ecosystems.







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