

SPECIAL REPORT

Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region

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The Marine Fishery Resource Development and Management Department (MFRDMD) of SEAFDEC has undertaken the vital effort of formulating the Regional Plan of Action (RPOA-Sharks) for the conservation and management of sharks and rays in the Southeast Asian region. RPOA-Sharks emphasized on the need to manage and exploit the shark resources at a sustainable level while safeguarding the fishers' livelihoods. Although sharks and rays are not targeted for most fisheries in the region, any decision made on regulating the international trade by listing several common species of sharks and rays in Appendix II CITES would affect the livelihoods of the region's traditional fishers and traders.

regional researchers, development of approaches for managing the resources of sharks and rays, publication of field guide for sharks and rays in national languages as well as the possibility of down-listing from Appendix II to Appendix III of CITES-listed sharks species based on scientific evidence and non-detriment findings.

Data on Landings

Data on the landings of sharks and rays were collected from Kota Kinabalu and Tawau in Sabah and Larut Matang in Perak, Malaysia since 2015. However, due to COVID-19 pandemic, data collection was halted for a few months in 2020.

Project Activities

Since 2003, SEAFDEC/MFRDMD has been implementing a series of projects on the conservation and management of sharks and rays in the region. The current project funded by the Japanese Trust Fund (JTF) VI Phase II "Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region" from 2020 to 2024 has Cambodia, Indonesia, Malaysia, Myanmar, Thailand, Philippines, and Viet Nam as the participating countries. The activities of the Project are mainly conducted in several study sites in Malaysia (**Figure 1**).



Figure 1. Study sites in Malaysia

MFRDMD organized the online First Core Expert Meeting Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region on 25 November 2020. During the Meeting, the achievements of the previous project implemented in 2015-2019 were presented. Moreover, several issues were highlighted and discussed during the Meeting including capacity building of

To train new enumerators and enhance the skills of the current enumerators, MFRDMD organized the Workshop on Landing Data Collection on Sharks and Rays Series 1/2020 on 24–27 August, 2020 in Terengganu, Malaysia. The Workshop also included lectures on taxonomy and statistics as well as exercises on the identification of parasites that are found in the digestive and respiratory organs of sharks and rays.

Tissue Sampling for DNA Analysis

In 2020, tissue samples for DNA analysis were collected from samples in Pahang and Terengganu in the east coast of Peninsular Malaysia. A total of 138 sharks (39 species), 259 rays (50 species), and 20 skates (five species) were sequenced for DNA barcoding. The data was submitted to the Barcode of Life Data Systems (accessed at <http://boldsystems.org/>) which is an informatics workbench aiding the acquisition, storage, analysis, and publication of DNA barcode records. Moreover, the genetic population structure of *Carcharhinus sorrah*, *Chiloscyllium hasseltii*, and *Sphyrna lewini* would be clarified using mitochondrial DNA marker. For Perak in the west coast of Peninsular Malaysia and Kota Kinabalu and Sandakan, Sabah, sample collection would be continued in 2021.

Freshwater Stingrays

Information on freshwater stingrays in the region is still scanty despite some records that were published in Cambodia, Indonesia, Lao PDR, Malaysia, and Thailand. In Peninsular

Malaysia, freshwater stingrays have been recorded in Pahang River and Jelai River in Pahang; Kelantan River, Pergau River (**Figure 2**), and Nenggiri River in Kelantan; Perak River in Perak; and Sembrong River and Endau River in Johor. The species were confirmed as *Fluviatrygon signifier* (Compagno & Roberts, 1982) found in the Jelai River and Kelantan River, *Urogymnus polylepis* (Bleeker, 1852) in Sembrong River, and *Fluviatrygon kittipongi* (Vidthayanon & Roberts, 2006) (**Figure 3**) in Perak River. However, the specimens from other rivers are still unidentified due to morphological uncertainties. MFRDMD has been working closely with Universiti Malaysia Sabah in this endeavor starting 2020. Nevertheless, the compilation of the information on the biodiversity status of freshwater fishes is necessary for sustainable management of inland fishery resources in the region.



Figure 2. Pergau River in Kelantan, Malaysia is one of the sandy rivers where freshwater stingrays inhabit

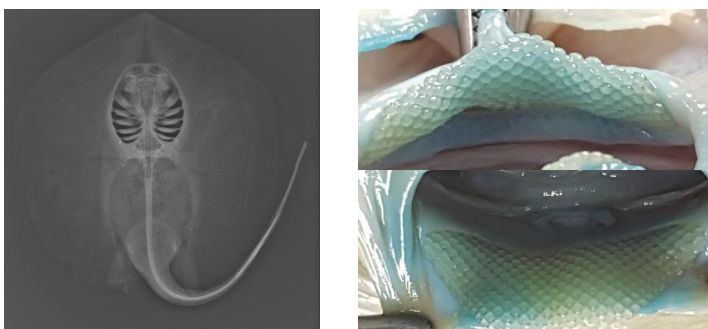


Figure 3. X-ray image (left) and upper and lower row of teeth (right) of *Fluviatrygon kittipongi* specimen

Nursery Ground of Sharks and Rays in Pahang

In 2018, the Department of Fisheries Malaysia and JTF supported the study to identify the nursery ground of sharks and rays in Pahang. Series of trawl surveys (**Figure 4**) were conducted during monsoon season (November–March) and it was found that 97.9 % of sharks and 68.4 % of rays were at juvenile stage, which were released back to the sea after length-weight and sex data were recorded (**Figure 5**). All species were

of high commercial value and have high demand in the market such as *Chiloscyllium hasseltii* (**Figure 6**) and *C. punctatum* for sharks; and *Maculabatis gerrardi*, *M. pastinacoides*, *Neotrygon orientalis*, *Telatrygon zugei*, and *Telatrygon biasa* for rays. In addition, MFRDMD also conducted a collaborative study with Universiti Malaysia Terengganu using carbon 13 ($\delta^{13}C$) and nitrogen 15 isotope ($\delta^{15}N$) stability analysis and to study the juvenile food source network of sharks and rays in Kuala Pahang. The results of the study confirmed that young sharks and stingrays were highly dependent on natural food resources available in the waters of Kuala Pahang.

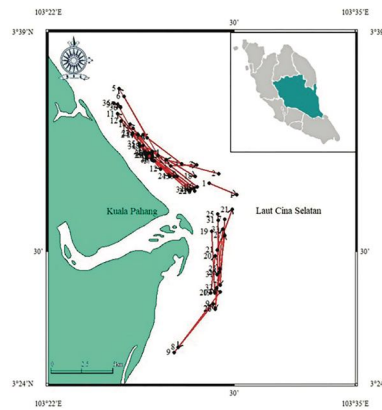


Figure 4. Trawl survey stations for nursery ground study in Pahang, Malaysia



Figure 5. Releasing of juvenile sharks and rays back to the sea after recording the length-weight and sex data

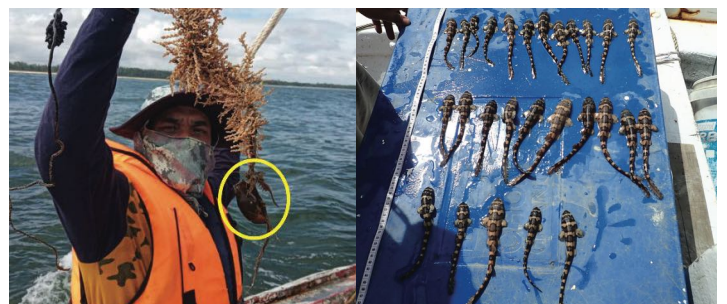


Figure 6. *Chiloscyllium hasseltii* (left: egg case, right: juvenile) caught during the one-hour trawl survey in Pahang, Malaysia

Way Forward

The COVID-19 pandemic has disrupted the implementation of the original plans of the project. MFRDMD would continue to implement the project on sharks and rays, particularly the data collection at selected landing sites, training and workshop on taxonomy and biology, study on genetic population structure of *Carcharhinus sorrah*, *Chiloscyllium hasseltii*, and *Sphyrna lewini*, and survey on fishers' dependencies, marketing and trade in Pontianak, Indonesia. ☒