Mitigating Interactions and Reducing Mortality of Sea Turtles due to Fishing: SEAFDEC Initiatives

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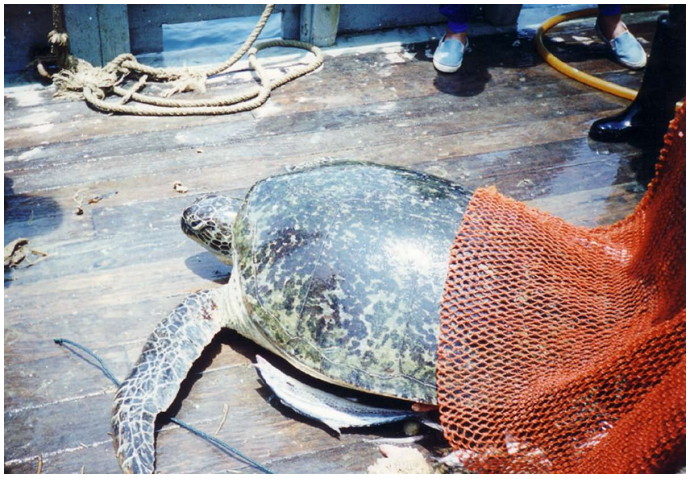
The Southeast Asian region is home to one of the highest biodiversity and richest marine ecosystems in the world. Specifically, six of the seven species of living sea turtles in the world are commonly found in the marine waters of the region, these are the leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*) and flatback (*Natator depressus*).

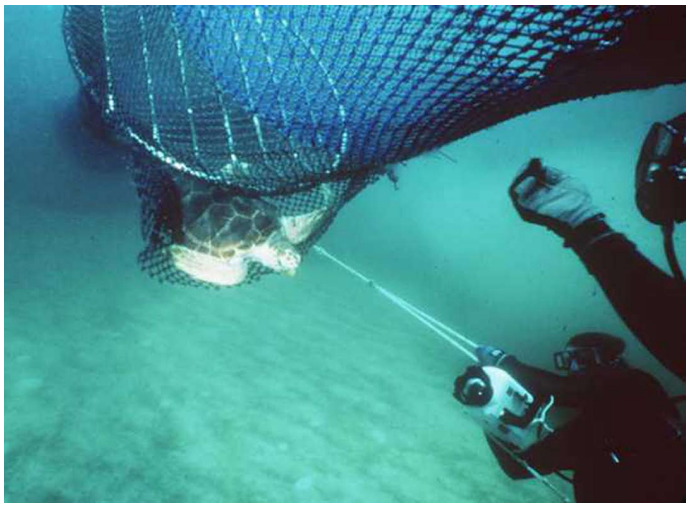
The expansion of fishing activities in coastal areas and in the high seas over the past few decades has contributed to important changes in the marine ecosystems. This is not only in terms of the target fishery resources but also the other ecosystem components that are directly or indirectly affected by fishing activities. In response to such developments and concerns over the deteriorated status of the marine ecosystems, a number of global and regional initiatives have been initiated. These include the 1992 UN Conference on Environment and Development (UNCED), the 1995 FAO Code of Conduct for Responsible Fisheries, the 1995 UN Fish Stock Agreement, the 2001 Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem, and the 2001 ASEAN-SEAFDEC Resolution on Sustainable Fisheries for Food Security for the ASEAN Region. All of the abovementioned initiatives are pointing to a common concept, which is the "sustainable use of aquatic ecosystems".

Sea turtles are highly migratory and share the waters of the Southeast Asian region. However, sea turtles are mostly affected by man-made interventions either fishing or non-fishing activities. In view of the importance to maintain the sea turtle biodiversity and the overall aquatic ecosystem balance, the SEAFDEC Member Countries have over the years been taking initiatives in promoting the conservation and management of sea turtles in the region.

Conservation and Management of Sea Turtles in Southeast Asia

In 1997, the Agriculture and Forestry Ministers of the ASEAN Member Countries endorsed the Memorandum of Understanding (MoU) on ASEAN Sea Turtle Conservation and Protection, aimed at promoting the protection, conservation, replenishing and recovery of sea turtles and their habitats based on the best available scientific evidence, taking into account the environment, socio-economic and cultural characteristics of the respective ASEAN countries. The MoU has been initially supported by the ASEAN and SEAFDEC collaborative program on Conservation and Management of Sea Turtles in Southeast Asia from 1998 to 2004 (Managing Sea Turtles in Southeast Asia: Hatcheries and Tagging Activities, Fish for the People, Vol. 1 No. 3: 2003). The major achievements of the program, which was funded by the Japanese Trust Fund, are summarized briefly in **Box 1**. A follow-up program on Research for Stock Enhancement of Sea Turtles in the ASEAN Region





Sea turtle released from a fishing gear installed with a Turtle Excluder Device (TED)

Box 1. Achievements of the ASEAN-SEAFDEC Program on Conservation and Management of Sea Turtles

1. Establishment of the ASEAN-SEAFDEC Sea Turtle Research Network comprising national coordinators from the ASEAN countries and used as a regional forum for exchange of information on national programs and priorities on sea turtle research;

2. Organization of a number of regional conferences and workshops to exchange information and expertise as well as to develop a harmonized format for collecting data and information on sea turtles in the region;

3. Compilation and dissemination of information and research results on sea turtle conservation and management in the region in various forms of publications such as books/proceedings/ technical and information papers among which two have been noted internationally, such as the Conservation and Enhancement of Sea Turtles in the Southeast Asian Region, and Guide to Set and Manage Sea Turtle Hatcheries in the Southeast Asian Region;

4. Distribution of 11,300 inconel tags and applicators to all Member Countries except Lao PDR and Singapore, used for the migratory study of sea turtles in the region; and

5. Development of turtle excluder device (TED) applicable for the regional situation and conduct of research and demonstration on TED in various ASEAN Member Countries in response to pressure of the US embargo on shrimp export starting in 1997.

for 2005-2008 (**Box 2**), which is also supported by the Japanese Trust Fund, is being pursued to sustain the continuing efforts of the SEAFDEC Member Countries in the conservation and management of the sea turtles.

While noting that conservation and management of sea turtles are not easy tasks, the ASEAN countries have been determined to take bolder steps towards this endeavor. Their strong commitment was reaffirmed at the 13th Meeting of ASEAN Sectoral Working Group on Fisheries in May 2005. During that Meeting, the progress and achievements in the conservation and management of sea turtles in the region since 1998 were discussed, and their strong support to the initiatives and implementation of the activities on the Research for Stock Enhancement of Sea Turtles in the ASEAN Region as promoted by SEAFDEC, was reaffirmed.

Such commitment was further confirmed at the 38th Meeting of SEAFDEC Council in April 2006 in Brunei Darussalam, where the SEAFDEC Member Countries officially launched the "Year of Turtle" in the ASEAN region. This set the momentum for the regional campaign in building awareness and exchange of information and experiences among the SEAFDEC Member Countries at regional and national levels on the issue, and was also regarded as a SEAFDEC joint effort towards the 2006

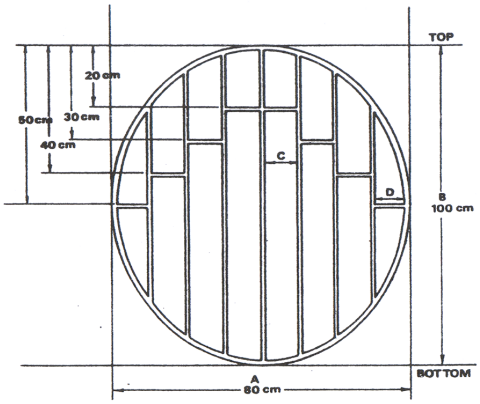
Box 2. Research on Stock Enhancement of Sea Turtles in the ASEAN Region (2005-2008)

1. DNA study for the stock/population identification of sea turtles from the ASEAN region and detection of multiple paternities for estimation of stock size of male sea turtles;

2. Tagging and satellite telemetry study using inconel tags at established rookeries in the ASEAN countries, focusing on populations where no or very little information is available such as in Indonesia, Malaysia, Myanmar and Vietnam;

3. Feasibility study on head-starting (Sea Turtle Nursery) by reviewing the head-starting technique as a management tool for sea turtles and where global and regional attempts on the head-starting experiments are reviewed to find out whether they were successful or not; and

4. Interaction between sea turtles and fisheries
   - 4.1 information collection on sea turtle interaction with fishing operations in Southeast Asia
   - 4.2 comparative study on the efficiency of the Circle hook and the J-hook in pelagic and bottom longlines
   - 4.3 assessment/evaluation of lessons learned from the introduction and promotion of TEDs in shrimp trawls, taking into account the 2004 FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations.



The Thai Turtle Free Device (TTFD)

Year of Turtle promoted by the Indian Ocean-Southeast Asian (IOSEA) Marine Turtle Secretariat.

Reducing the Interactions and Mortality of Sea Turtles due to Fishing

One factor that contributes to the success in sea turtle conservation and management in Southeast Asia lies on the importance of better understanding the interactions between sea turtles and fishing activities. Such understanding could not only improve sea turtle mortality from fishing in general but also help focus all efforts in improving other measures and initiatives for the conservation and management of sea turtles. Along this line, a number of activities and initiatives to reduce interactions and mortality of sea turtles from fishing has been undertaken by SEAFDEC over the past years. The summary results of such activities and initiatives are given in **Box 3**.

Future Directions

In taking progressive steps towards improved conservation and management of sea turtles in the region, the existing initiatives and collaboration would be continued and to some extent intensified. Assessing the relationship between sea turtle mortality and fishing could reinforce the conservation and management interventions of the sea turtles (Refer to "Following-up on the Conservation of Sea Turtles in Southeast Asia: DNA Study," this issue of Fish for the People). In this regard, SEAFDEC in collaboration with the Member Countries will continue to undertake a number of priority projects on turtle conservation beyond 2008 (**Box 4**).

Box 3. SEAFDEC Program on Reducing Interactions and Mortality of Sea Turtles from Fishing

1. Development and Application of Turtle Excluder Devices (TEDs) in Shrimp Trawls. In response to the US shrimp embargo in 1996, SEAFDEC in collaboration with Thailand, Malaysia, the Philippines, Brunei Darussalam and Indonesia conducted a regional collaborative program on the development and application of TEDs in shrimp trawls, with funding support from the JTF Program. The major activities included the design, development and implementation of the "Thai Turtle Free Device (TTFD) in shrimp trawl fisheries; experiments on various designs of TEDs, namely: Anthony Weedless, Supershooter, Bent Pipe, Georgia Jumper and Mexican models. The experience on the application of the various designs was further used to develop another Thai TED called the "Thai-KU", which is tailored to the fisheries situation in the region. Since then, a series of on-site demonstration and training for government officials on the installation and use of TEDs were conducted in the region.

2. Mitigation of Fishery-Sea Turtles Interactions: Efficiency of the Circle Hook in Comparison with J-hook in Longline Fishery. As recommended in the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations concluded during the FAO Technical Consultation on Sea Turtles Conservation and Fisheries in Bangkok, Thailand in December 2004, a comparative study between Circle hook and J-hook in longline fishing was initiated by SEAFDEC in 2005. Preliminary results of the experiments indicated that the Circle hook has higher catch rate of target species and lower by-catch, compared to the J-hook with the Circle hook also showing higher performance than the J-hook.

3. Regional Expert and Technical Consultations on Progress of Initiatives in Reducing Sea Turtles Mortality from Fishing. Based on the research results on the designs and experiments on TEDs in the region, a series of regional expert and technical workshops and consultations on the application of TEDs and initiatives to reduce sea turtle mortality from fishing have been organized since 1996. Experts and government officials working on the interactions between sea turtles and fishing have been meeting at least once a year under the SEAFDEC regional collaborative project on Responsible Fishing Technology and Practices to exchange information and experiences in addressing the issue. The outcomes from such workshops and consultations have been published and disseminated in the region and worldwide.

4. **Information Packages and Awareness Building Campaigns on Conservation and Management of Sea Turtles.** From the results of the research and experiments on TEDs as well as the regional workshops and consultations, a series of regional TED training courses have been conducted at national and regional levels. In addition, a wide range of promotional media for public awareness purposes (e.g., videos, posters, brochures, etc.) on the use and benefits of TEDs have been developed and disseminated targeting the fishers, the governments of the Member Countries, the coastal communities and researchers. The materials focused on the need to conserve sea turtles and the use of TEDs with an attempt to further improve fishers' acceptance of the use of TEDs and compliance to related management measures.

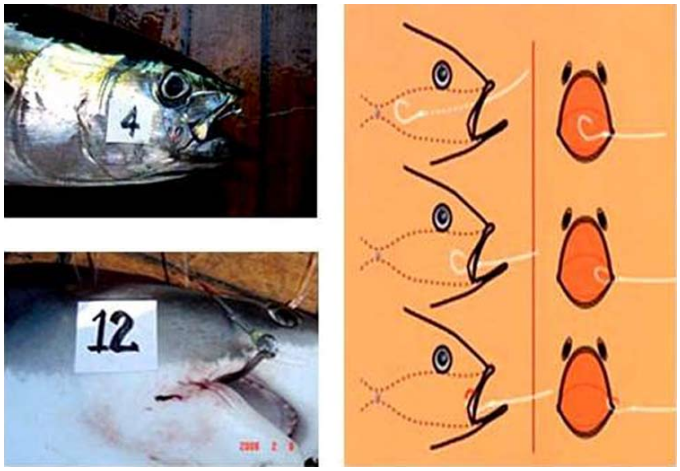
Box 4. Forward Actions on Reducing Interactions and Mortality of Sea Turtles due to Fishing

1. Comprehensive assessment of the application of Turtle Excluder Devices (TEDs) in the region by clarifying the factors contributing to successes and failures in the application of such devices;

2. Expansion of the experiments and demonstrations on the comparative study on Circle and J-hooks, involving wide number fishers in the conduct of such experiments, to provide direct opportunity and first-hand experience to the fishers, which in return, could enhance their cooperation and compliance;

3. Intensification of efforts on awareness building through wider dissemination of information packages on the conservation and management of sea turtles particularly addressing the importance of reducing sea turtle mortality from fishing; and

4. Fostering and expansion of networking, collaboration and partnership with organizations at national, regional and international levels in conservation and management of sea turtles in the region in general as well as reduction of sea turtle mortality from fishing in particular.



The hooking mechanism: fish takes the bait until the hook is caught on the fish's jaw

About the Author

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