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THAILAND

Introduction

Thailand is located in the middle of the Indochinese Peninsula, between latitudes 5°27' and 20°27'N and longitudes 97°22' and 105°37'E. The Kingdom's total area is 513,115 square kilometers, of which some 84 percent falls within the mainland section and 16 percent within the Peninsular South. The extreme length from north to south measures 1,620 kilometers, while at its broadest Thailand is only 780 kilometers wide from east to west. The narrowest strip at about 11°43'N latitude on the Peninsular South is 10.6 kilometers. The Isthmus of Kra is some 64 kilometers wide, situated further south at about 10°N latitude. The form is therefore anything but compact, affording Thailand excellent access to the seas with 23 of its 76 provinces touching the coastline.

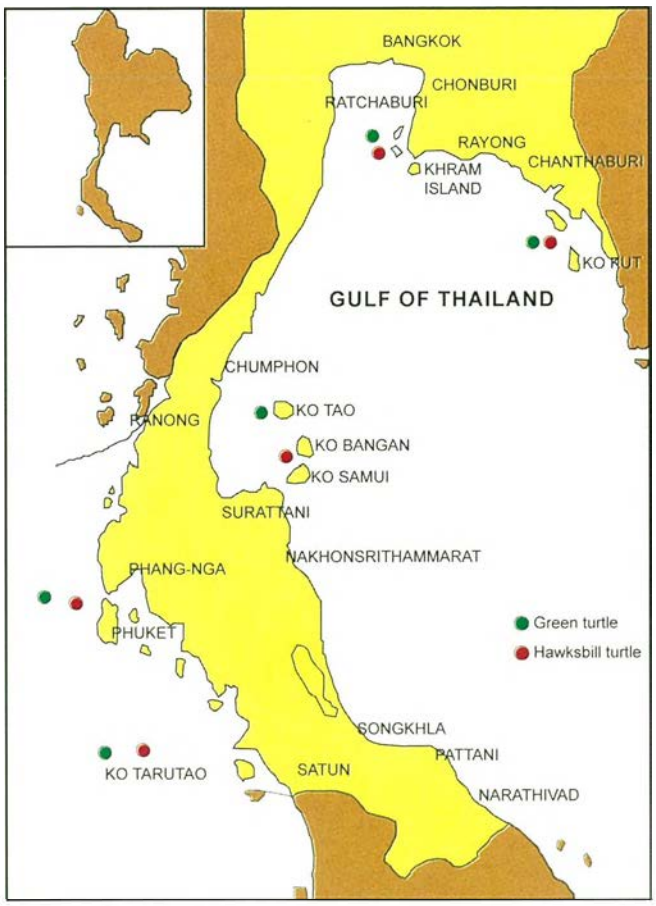

Figure 17. Distribution of Sea Turtle Nesting Beaches in Thailand

There are two areas that sea turtles can be found in the waters of Thailand as shown in Figure 17. Green and hawksbill turtles can be found along the coast and on some islands in the Gulf of Thailand while the leatherback and olive ridley turtles recorded on several location on the Andaman Sea coast (Chantrapornsyl 1992a, 1992b; Phasuk, 1992; Monanunsap and Charuchinda 1994). In the past, 5 species of sea turtles were recorded in Thai waters, namely green, hawksbill, olive ridley, leatherback and loggerhead turtles (Phasuk and Rongmuangsart, 1973). At present there is no record of loggerheads nesting in Thailand (Monanunsap and Charuchinda, 1994).

The nesting areas of sea turtles have been recorded in some protected areas in the gulf of Thailand, such as Mannai Island, Khram and also the adjacent islands. Sea turtles can also be found in some islands in the eastern coast and in the middle Gulf of Thailand. In the Andaman Sea coast, nesting areas are concentrated on the west coast of Phuket and Phang-nga Provinces, and on Similan Island (Charuchinda and Chantrapornsyl, 1999; Kuptawatin, 2004a).

Sea Turtles Conservation and Enhancement

In many areas, the number of sea turtles nesting have been declining. In order to protect the animals, conservation projects have been conducted by the Andaman Marine and Coastal Resources Research and Development Institute (Phuket Marine Biological Center) since 1971. The Eastern Marine and Coastal Resources Research Center (Mannai Sea Turtles Conservation Station) in the Gulf of Thailand was established in 1979. Since then the biology of sea turtles has been studied and many rookeries have been protected. Some of these areas were declared as National Parks in order to protect these animals and their habitats. Laws and regulations for protecting sea turtles were registered. Education and conservation campaigns have also been provided to the public (Kuptawatin, 2004a).

At present, all species of sea turtles and their products are legally listed as protected animals. Sea turtles and their products have been completely prohibited for consumption and trade since 1981. Several areas of sea turtle nesting have been declared as National Parks and Fisheries Preservation Zones. Protection of sea turtles in nesting areas is one of the management measures conducted by 4 main authorized organizations, namely the Department of Marine and Coastal Resources; Department of National Parks, Wildlife and Flora; the Royal Thai Navy and the Department of Fisheries (Kuptawatin, 2004a).

Legislations and Regulations

The present conservation and enhancement activities of sea turtles in Thailand are considered to be better compared to the past. Commercial harvest, sale and consumption of sea turtle meat and their products are prohibited. A number of laws and regulations have been implemented to conserve sea turtles such as follows:

1. Ministry of Agriculture and Cooperative Enactment 1947
   Sea turtles have been listed as protected animals. Killing of the sea turtles and eggs collection are prohibited.
2. National Park Act 1961
   The habitats and nesting areas of sea turtles in every National Park are protected.
3. Fisheries Act 1972
   Commercial fishing within 3 kilometers of the coastline is prohibited.

4. Ministry of Commerce Enactment 1980
   The export of sea turtles and their carcasses are prohibited.
5. Conservation and Protection of Living Resources Enactment 1992, Act No 19.
   Collecting of sea turtles, their products and carcasses are prohibited.
6. Wildlife Reservation and Protection Act 1992, Section 6.
   Sea turtles and their nests shall be protected from hunting, breeding, possession, trading, exporting and importing.
7. The use of Turtle Excluder Device (TED) in shrimp trawl has been enforced in 1996.

Hatcheries

There are a number of sea turtle hatcheries in Thailand which are managed by different government agencies as follows:

- Eastern Marine and Coastal Resources Research Centre in the Gulf of Thailand, Rayong Province (Mannai Sea Turtles Conservation Station) is managed by the Department of Marine and Coastal Resources.
- Sea Turtles Conservation Centre in the gulf of Thailand, Chonburi Province is managed by the Royal Thai Navy.
- Andaman Marine and Coastal Resources Research and Development Institute in the Andaman Sea coast (Phuket Marine Biological Centre) is managed by the Department of Marine and Coastal Resources.
- Coastal Fisheries Research and Development Centres (located along the coast line of the Gulf of Thailand and Andaman Sea) are managed by the Department of Fisheries.
- National Marine Parks are managed by the Ministry of Natural Resources and Environment.

Plate 74. Sea Turtle Hatchery in Thailand

The number of hatchlings produced by the hatcheries from 1980 to 2000 in Thailand is shown in Table 8.

Table 8. Number of Incubated Eggs and Hatchlings Released from the Hatcheries in Thailand: 1980-1994

Locations	Year	No. of Eggs Incubated	No. of Hatchlings Released
Mannai Island	1980-2003	118,862	38,381
Khram Island	1983-2003	106,147	61,500
Similan Island	1996-2001	20,693	13,350
Trang Province	1990-1994	1,655	904
Total		**247,357**	**114,135**

Several NGOs also participated in hatchery activities such as:

1. Yardfon Association in Trang Province.
2. Mai Khaw Beach Sea Turtles Conservation Club in Phuket Province.

Plate 75. Releasing of Juvenile Green Turtles in Thailand

Protected Areas/Sea Turtle Sanctuaries

Habitat protection has been strengthened by increasing the manpower to patrol the nesting beaches during the nesting season. Several agencies, NGOs and other institutions are now involved in environmental protection. By proper coordination, the National Parks and NGOs are able to increase the manpower for patrolling the nesting beaches.

Thailand has established many turtle sanctuaries to protect nesting females and also their eggs. The nesting beaches at Khram Island which was established in 1950 are protected by the Royal Thai Navy. Similan Island, Sirinarth National Park and Lumpee-Thaimuang beach National Park were established in 1961 and are under the management of the Department of National Parks. Mannai Island Sea Turtles Sanctuary was established in 1979 and is managed by the Department of Marine and Coastal Resources. Both the Department of National Parks and the Department of Marine and Coastal Resources are under the Ministry of Natural Resources and Environment (Kuptawatin, 2004a).

The public are prohibited to enter the sea turtle sanctuaries. However, in some sanctuaries, people can visit and study the sea turtles nesting for the purpose of conservation. While they are in the sanctuaries, people are not allowed to make noise, light-up fires or anything else that will disturb the nester.

Education/Public Awareness

Information concerning the sea turtle biology and conservation management has been provided to the public. Local educational campaigns on the plight of the sea turtles have been done in order to educate local people not to take sea turtles eggs for consumption. T-shirts, articles, newspapers, slide shows, radio and television announcements, posters and exhibition of the life history of the sea turtles were distributed for public awareness. The people were also invited to participate in the program of releasing young sea turtles into the sea. This impressive act created enthusiastic feelings of saving the sea turtles in the mind of the people. The agencies involved in the education campaigns are the DOF, Royal Thai Navy, Department of Marine and Coastal Resources and Department of National Parks, Wildlife and Flora (Charuchinda and Chantrapornsyl, 1999). The NGOs such as the Mai Khaw Beach Sea Turtles Conservation Club and Yard Fon Association were also involved in the campaign.

Plate 76. Rearing of GreenTurtles Hatchings for Public Awareness

Tagging and Satellite Telemetry Tracking Activities

Information on feeding, foraging habitats, knowledge on life cycle and reproductive biology of sea turtles is still limited in Thailand. Tagging activities in Thailand was done by using flipper tags (inconel and plastic tags) and PIT tag. A total of 149 female green turtles were tagged with PITs during the nesting season at Khram Island from 1994-2003. Female green turtles could return to nest 3-6 times in the same year of the nesting season (Kuptawatin, 2004b).

In order to study the migration route and foraging habitats of sea turtles, the satellite telemetry tracking method for adult female sea turtles was applied. In 2000, five post-nesting green turtles were attached with PTTs in the Gulf of Thailand. The results showed that 4 different migration patterns were recorded. The first route was found from 2 females at Khram Island where they were still staying around the nesting areas. The second route was found from one turtle traced from Mannai Island where she travelled by passing through the Gulf of Thailand heading to the south. The third route was from another 2 females, one route to the southeastern coast of the Gulf of Vietnam Peninsula, and after that she travelled to the east, across the South China Sea to the north of Sabah. The other one heads in the same direction as the first one but stopped travelling in October where it stayed around the Rong Island of Cambodia until the last signal. The fourth route was from a turtle which crossed the Gulf of Thailand to the western coast and headed to south. The female turtles which nested in the gulf of Thailand, migrated a long distance from different feeding grounds and habitats but were still within the region (Charuchinda et al. 2003a).

Plate 77. Tagging of a Juvenile Green Turtle Using PIT Tag Before Releasing

During the same year, four green turtles were attached with PTTs and released from Phuket and Similan Islands. Two turtles went to the southwestern coast of Thailand while the third swam to the northwestern coast. The fourth moved to Andaman Island, India. The destination of these turtles was the sea grass habitats. The duration of the PTT signal was between 3-32 days. During cruising and feeding, the adult turtles swam 18-66 and 2-12 km/day respectively. In 2001, four hawksbills were attached with PTTs. Signal data obtained showed that all turtles moved randomly along the coastline in the northern part of the Gulf of Thailand, with a depth of 20 meters, probably to search for suitable feeding areas. Swimming speed was estimated in a range of about 0.45-0.57 km/hr (Kuptawatin, 2004b).

From 2001-2002, eight post-nesting greens were attached with PTTs and released from Huyong Island at the Andaman coastline. During inter-nesting period which lasts up to 100 days, the turtles aggregated mainly within 27 km from the nesting island. After the last nesting, all the turtles headed to Andaman Island (Kuptawatin, 2004b).

In 2002, one female loggerhead was attached with a PTT and released from Mannai Island. The turtle headed in a southwestward direction across the Gulf of Thailand, passed through the South China Sea

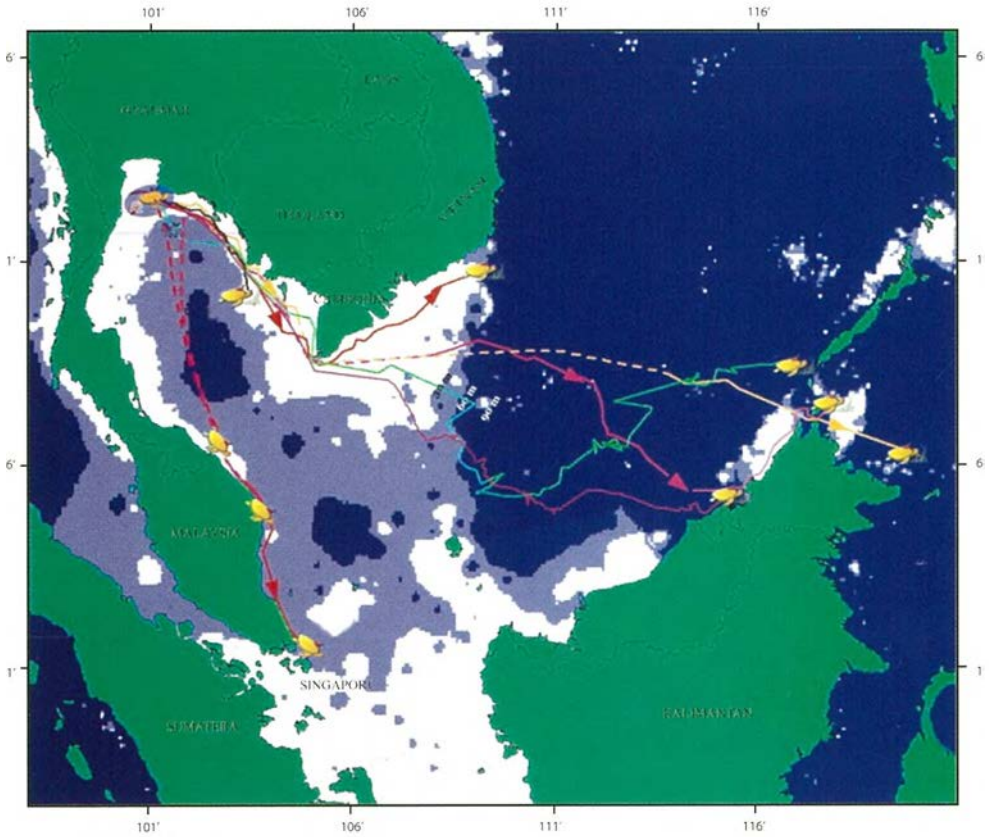

Figure 18. Migratory Pathway of Green Turtle Tracked by Satellite after Nesting in Thailand

off Peninsular Malaysia, crossed Indonesian waters to the Western Coast of Australia with the distance of 3,985 km from the releasing point in Thailand (Charuchinda et al. 2003b).

In the same year, two female hawksbills attached with PTTs were released at Ira and Lan Islands in the inner Gulf of Thailand. During February to March 2002, both hawksbills nested and moved within 25 km from their nesting beach. This data showed that post-nesting hawksbills do not immediately migrate to foraging areas but still move around the nesting beach (Monanunsap et al. 2003).

In March 2003, one green turtle was attached with a PTT at Mannai Island and, after being released for 20 days, the signal was lost. One post-nesting green turtle was attached with a PTT at Khra Island in Nakhonsrithammaraj province at the end of July. She swam to the south during the end of August where she stayed near Singapore. Her swimming speed ranged from 40-50 km/day (Kuptawtin, 2004b).

International/Regional Cooperation

With regard to the conservation and enhancement of sea turtles, Thailand has collaborations with several international and regional organizations such as:

1. Sea turtle tagging program with SEAFDEC/MFRDMD.
2. Sea turtle hatchery management with SEAFDEC/MFRDMD.
3. Southeast Asia Sea Turtle Cooperative Research (SEASTAR2000).
4. Thailand is a party of CITES since 1983.
5. Thailand has signed the MoU on ASEAN Sea Turtle Conservation and Protection in September 1997.

Research Activities

Two main institutions in Thailand actively involved in conducting research on sea turtles in various aspects are Eastern Marine and Coastal Resources Research Center and Andaman Marine and Coastal Resources Research Institute. Many publications are published locally and internationally.

The key persons who are actively involve in sea turtles issues in Thailand are as follows:

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