



SEA TURTLE SPECIES OF THE SOUTHEAST ASIAN COUNTRIES

Introduction

Six of seven species of living sea turtles in the world were confirmed to nest or inhabit the Southeast Asian waters. These are leatherback (*Dermochelys coriacea*), green turtle (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*) and flatback turtle (*Natator depressus*); (Kamarruddin, 1993; Soehartono, 1993; Palma, 1993; Chantrapornyl, 1993; Sukarno et al., 1993; Chantrapornsyl, 1996 and Kamarruddin et al., 1996). All these six species are commonly found in ASEAN waters except for the flatback which are found in eastern Indonesia. The flatbacks are known to nest in Australia but the foraging areas are in the Indonesian waters. The occurrence of sea turtle nestings in the Southeast Asian nations is shown in Table 1. Indonesia has the most number of sea turtles species as compared with other countries in the region.

Table 1. The Occurrence of Sea Turtles in the Southeast Asian Countries

Country	Leatherback	Green	Hawksbill	Loggerhead	Olive Ridley	Flatback
Brunei Darussalam	x	x	x		x	
Indonesia	x	x	x	x	x	x
Malaysia	x	x	x		x	
Philippines	x	x	x	x	x	
Thailand	x	x	x	x	x	
Myanmar	x	x	x	x	x	
Cambodia	x	x	x	x	x	
Vietnam	x	x	x ¹	x	×	

All these species are highly migratory, often passing through territorial and international waters from foraging to nesting ground and back again. The turtles are likely to come from an area within a radius 2,500 km around the nesting area (Limpus 1993). Green turtles that were satellite tracked from Pulau Redang, Terengganu indicate migration to the South China Sea and Sulu Sea areas. In addition, satellite tracking of green turtle nesting in the Sarawak and Sabah Turtle Island and some from Thailand also swam to the Sulu Sea. Additional studies of satellite-tracked hawksbills revealed movement of great

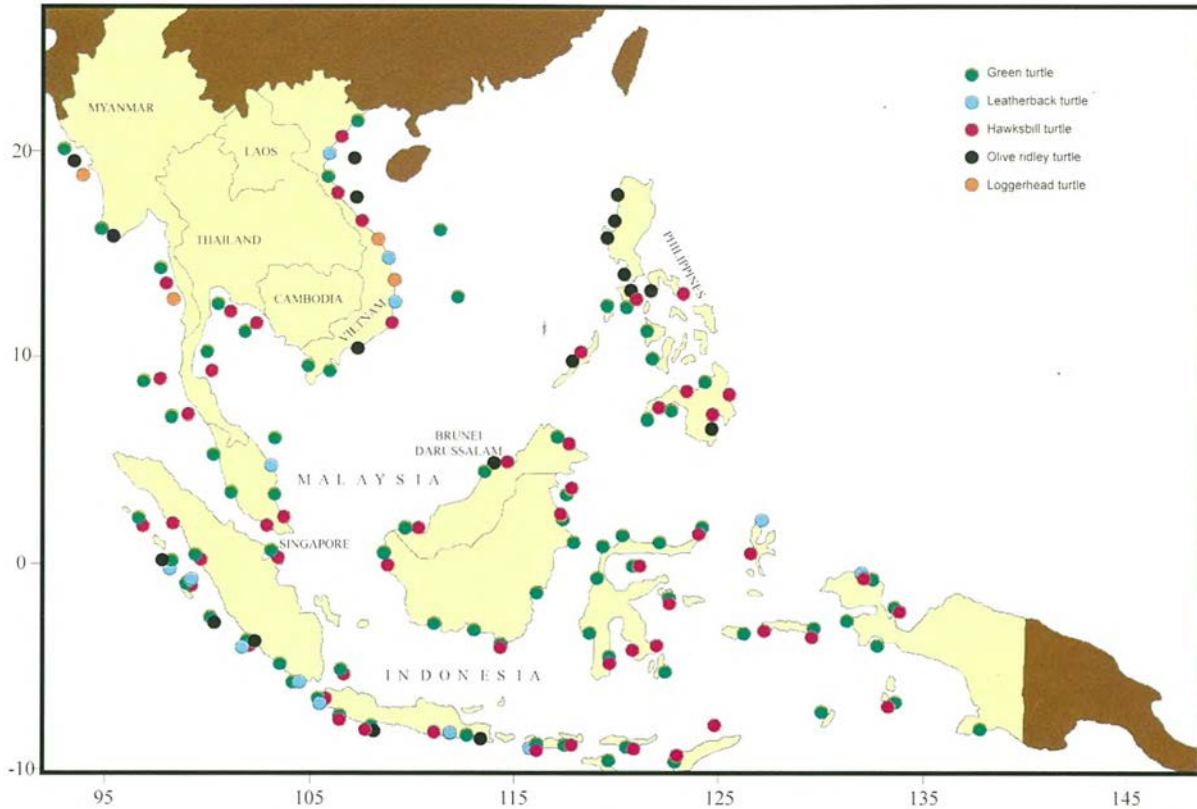


Figure 3. Distribution of Sea Turtles Nesting Species in the Southeast Asian Region

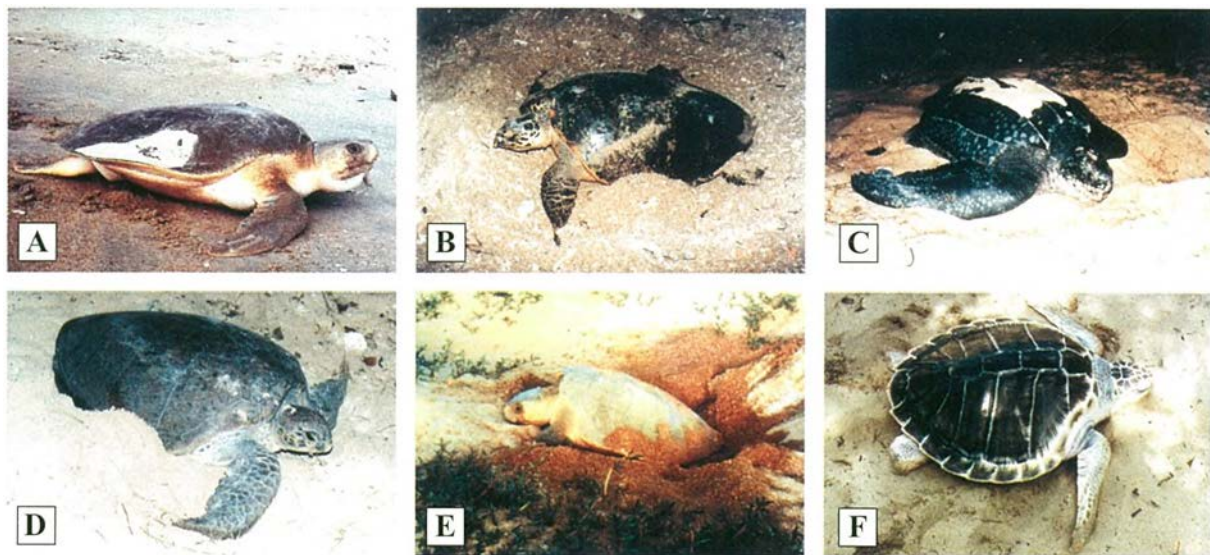


Plate 22. Six Species of Sea Turtles Reported to Nest or Inhabit Southeast Asian Region. A-Flatback, B-Hawksbill, C-Leatherback, D-Green, E-Loggerhead and F-Olive Ridley.

distances, over 1,000 km (Liew, 2002). Since these animals transcend national boundaries, they are shared resources among countries. Thus, the countries in the region have a common responsibility and ownership of a particular population.

Taxonomy, Biology, Population and Distribution

Leatherback Turtle (*Dermochelys coriacea*)

The leatherback turtle is one of the largest marine reptiles alive today. The heaviest known specimen recorded up to 585 kg. The leathery-covered carapace distinguishes it from other hard-shelled turtles. The adult female nesting in Terengganu, Peninsular Malaysia average 162.4 cm curved carapace length. Reproduction is seasonal and in Peninsular Malaysia nesting is nocturnal and the peak is from June to July. The clutches are composed on average of 60-120 eggs with 16.3% of yolkless eggs (Sukarno et al., 1993). Typical yolkless eggs are smaller than yolked eggs and many cases misshapen and are deposited last. Generally, eggs average 5.5 cm in diameter. Embryo development is completed during an incubation period, which lasts for 55-75 days. Hatchling emergence from nest at early evening. Oceanic distribution of leatherback may reflect the distribution and abundance of macroplanktonic prey. The main diet for the leatherback is primarily cnidarians (jellyfish and siphonophores).

The leatherback turtle is known to nest primarily on the beaches of Terengganu, Malaysia and northwest Irian Jaya, Indonesia. The major rookeries in Malaysia are found, particularly at a 1.5 kilometers stretch of beach of Rantau Abang and Paka, Terengganu and on the beach of Chendor, Pahang. In the 1950s, about 2,000 females per year were found nesting but the numbers dropped drastically. In 1994, only 213 nests were recorded at Rantau Abang rookery. Nesting season of leatherback turtles is from March to September each year and the peak period is June and July

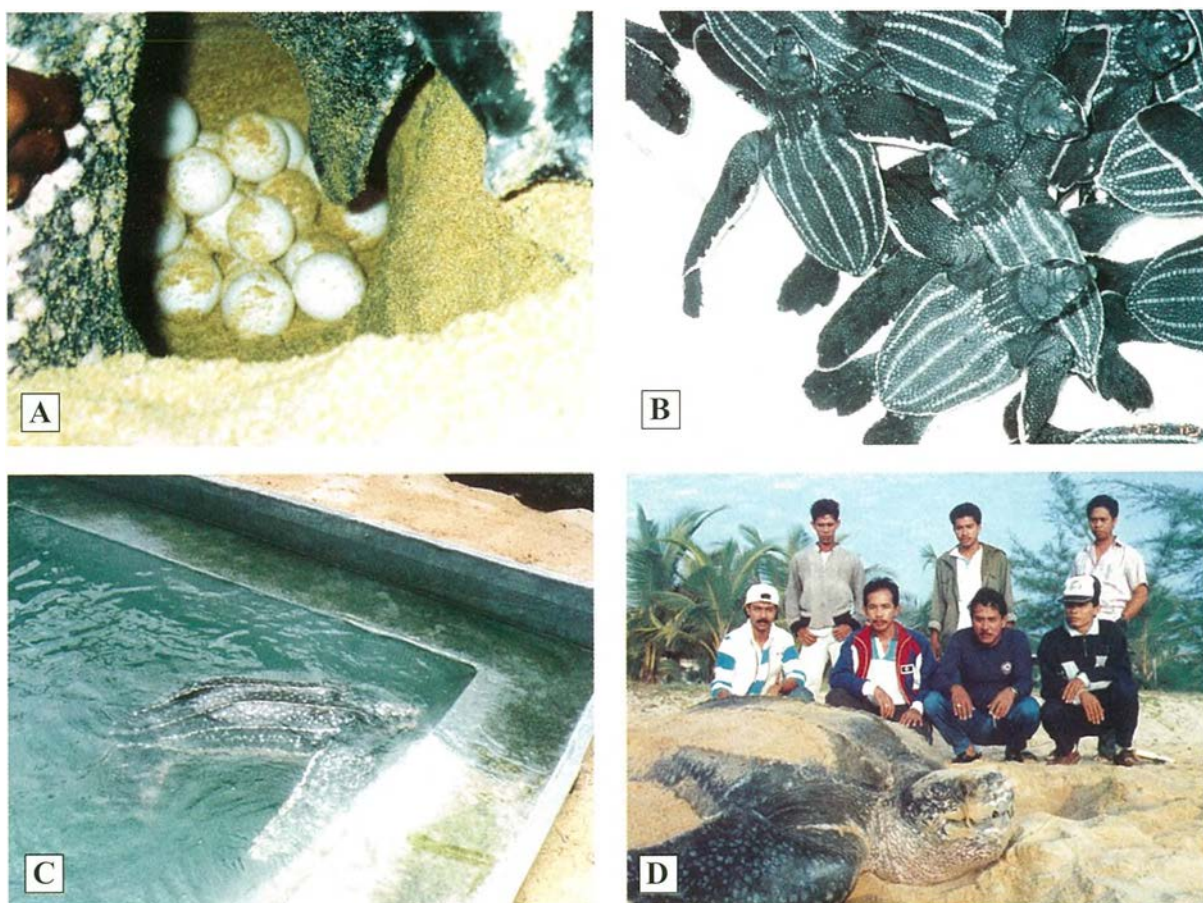


Plate 23. A-Eggs, B-Hatchlings, C-Juvenile and D-Adult Leatherback Turtle



Plate 24. Internal Organ of Juvenile Leatherback Turtle. (Note: Death in Captivity)

(Chan and Liew, 1989, Sukarno et al., 1993). No report has been made about the nesting of leatherback turtles on the west coast of Peninsular Malaysia.

The leatherback turtles are also confirmed to nest on the Andaman Sea coast of Thailand but the population status is unknown (Phasuk and Rongmuangsart, 1973 and Chantrapornsyl, 1996). While in Indonesia, leatherbacks have only been found in South Sulawesi, Maluku and northern Irian Jaya. In the Philippines, leatherbacks were reported to nest on the Quiniuban Island group northeast of Palawan. A number of sightings and stranded leatherbacks were also reported from Hinunangan, Southern Leyte and Binnuangan, Tubay, Agusan del Norte. In Vietnam, leatherbacks are distributed in the sea areas of Do Son District, Hai Phong City; Khanh Hoa Province; Phu Quoc Island in Kien Giang Province; and it is also listed as being present in the Con Dao archipelago in Ba Ria –Vung Tau Province, although evidence and sightings are lacking here.

Green Turtle (*Chelonia mydas*)

The green turtle is distinguished from other sea turtles by a single pair of prefrontal scales, four pairs of lateral scutes and five vertebral scutes. The carapace is broad, low and heart-shaped. It is smooth, without keels and scutes are placed side by side. The shell colour is light-to-dark-brown. The plastron is whitish-to-yellowish. Sexual dimorphism is present in adult animals and the male has very long tail. The male green turtle has a single claw, which is markedly enlarged and strongly curved. The curved carapace length of adult green turtle ranges from 70 to 120 cm with an average of 99.5 cm in the Philippines. Mating could occur for several hours; for example it lasts for 7 hours in Redang Island, Malaysia (Sukarno et al., 1993). Clutch size averages 104 eggs. Reproduction is seasonal but extended throughout the year at several areas. In Terengganu, Malaysia and Khram Island in Thailand the peak is between May to August (Sukarno et al., 1993, Chantrapornsyl, 1996) while in Turtle Island Sabah the peak nesting period is from July to October (Muhamad Saini, 1996). The main diet for the green turtles is algae and sea grasses.

The green turtle is by far the most extensively distributed sea turtle species in the Southeast Asian region. This species is known to nest on the beach of all countries of the region. In Peninsular Malaysia, the major nesting sites are found on Pulau Redang, Paka and Geliga in Terengganu. Chendor is the main green turtle rookery in Pahang, even though nestings are also reported on the offshore islands and other remote beaches at Pekan and Rompin. The population at Pantai Segari in Perak constitutes the only significant nesting aggregation along the west coast of the peninsular.

In East Malaysia, the green turtle nestings are concentrated on the Sarawak Turtle Islands of Talang Talang Besar, Talang Talang Kecil and Satang Besar and Turtle Islands of Sabah that is Pulau Bakkungaan Kecil, Selingaan and Gulisan. The annual nesting of green turtles in Malaysia is estimated to be about 15,500. The populations from all nesting sites have shown declining trends.

In the Philippines the major nesting sites are on the Turtle Islands (Tawi Province), a group of islands shared with Sabah in the Southern Sulu Sea (Selingaan, Gulisan and Bakkungaan Kecil) and about 80% of green nestings occurred in these areas (Palma, 1993). As of July 1993, a total of 50,898 complete nests were recorded from Baguan Island and in 1992, a total of 1,052,168 eggs were produced (Palma, 1993). The population of nesting green turtles in Turtle Islands is estimated to be about 2,500. The green turtles are also reported to nest on Calauit and Matanubong Islands off Palawan.

The principal nesting site in Thailand is on the east coast (Gulf of Thailand) especially at Ko Khram which in 1993 recorded 282 nests (Chantrapornyl, 1996). Nesting of green turtles were also reported in the west coast from the Province of Satun, Phuket and Phangnga. In 1993, a total of 128 nests of green turtles were reported from the Andaman Sea nesting sites.

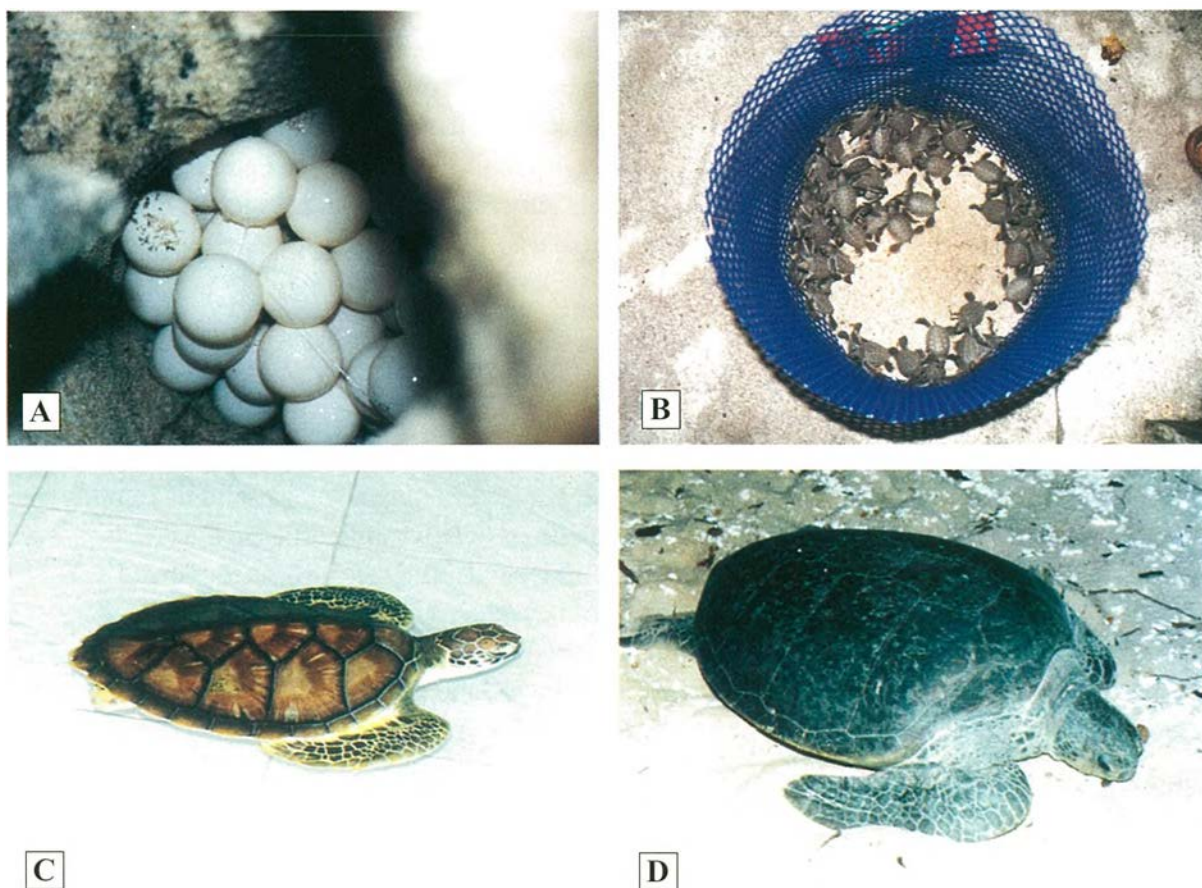


Plate 25. A-Eggs, B- Hatchlings, C-Juvenile and D-Adult Green Turtle

Green turtles are considered common all around the coastline of Indonesia. Nestings were reported from 10 provinces, however the status of the population size is still not mentioned (Soehartono, 1993). In Vietnam, the main nesting locations are Hon Bay Canh and Hon Tre Lon Islands and the nesting season occurs from April to November and from May to August is the peak season. The present status of the population is still unknown.

Hawksbill Turtle (*Eretmochelys imbricata*)

Hawksbills are distinguished from other sea turtles by two prefrontal scales, thick posterior overlapping carapace scutes, four pair of coastal scutes, the anterior-most not in contact with the nuchal scute, and two claws on each flipper. The carapace is typically serrated along the posterior margins. The head is relatively narrow, the beak tapers to a point and the maxilla projects slightly beyond the mandible. Mean straight-line carapace length (SCL) of adult female ranges from about 66 to 86 cm and weight is typically 80 kg. Adult males are distinguished by a long, thick tail that extends well beyond the carapace margin and well-developed, recurved claws on the fore flippers. Mating occurs on the surface of shallow waters adjacent to the nesting beach and may last several hours. Nesting is seasonal, but the season is often expanded and in a few localities nesting may occur throughout the year with one or two peaks. In Thailand, for example peaks are reported in February to April and June to July (Chantrapornsyl, 1996). Incubation is generally 50 to 70 days in the west coast of Peninsular Malaysia. Hawksbills forage on coral reef of the offshore islands and these turtles consume a variety of food but specialize on sponges.

Historically, major hawksbill concentrations have been located in Southeast Asia. Hawksbill numbers have greatly declined since the hawksbill nesting may not receive the same attention in areas with high green turtle nesting density (Limpus, 1993). Highest concentration of hawksbill turtles in Peninsular Malaysia is found in Malacca (Sukarno et al., 1993). The major nesting sites in the state are Pulau Upeh, Kuala Linggi and Tanjung Bidara. Hawksbill may also be found in Terengganu, Pahang and the offshore islands of Johor. The distributions of hawksbill turtles in East Malaysia are concentrated on the turtle islands of both Sarawak and Sabah. Turtle Islands in Sabah are believed to be the most significant hawksbill nesting sites in Malaysia with about 600 nests annually. A total of 4,933 clutches of hawksbill were recorded in the period from 1982 to 1992. Generally, the peak of nesting season for hawksbill in Malaysia is from March to June every year.

In Thailand, nesting occurs on both the east and west coast as well as on some offshore islands, namely Ko Klang, Ko Kra; Pattani Province, Songkla Province and Narathiwat Province. The main rookeries on the east coast (Gulf of Thailand) are Ko Kut, Ko Chang and Khram Islands (Eckert, 1993, Chantrapornsyl, 1993). The existing nesting populations size is estimated to be 100 nests annually.



Plate 26. Green Turtle Track at Mak Kepit Turtle Sanctuary, Redang Island, Malaysia.

The hawksbills occur widely with low nesting densities throughout the Philippines. No major nesting aggregations have been identified but hawksbills were found to nest in small numbers on numerous islands. Hawksbill are mostly found along the western, eastern and northern coasts of Sumatra (especially Batu Islands), northern and southern Java, north of Nusa Tenggara, southern and northeast Sulawesi, Maluku, southern Kalimantan and north of Irian Jaya (Soehartono, 1993). Meanwhile, in Vietnam the nesting areas for hawksbills are on the Con Dao National Park Islands and the size of the population is not known.

Olive/Pacific Ridley Turtle (*Lepidochelys olivacea*)

The olive ridley is a relatively small sea turtle with six to eight and occasionally five or nine pairs of lateral scutes, asymmetry relative to the number of scutes on either is not common. The carapace is uniform olive in colour. The head is relatively large compared with green and hawksbill turtles. Male olive ridleys have a long tail with heavy terminal nail. Adult females weighed from about 35 to 45 kg. The curved carapace length is in the range of 40 to 70 cm. In Peninsular Malaysia, most nesting occurs between February to August and the peak is in May to July (Sukarno et al., 1993). In contrast, nesting occurs between October to February at Phuket, Thailand. The number of eggs laid per clutch ranges from 50 to 110. Hatchlings emerge from the nest after about 45 to 65 days and most hatchlings emerge at night. The non-nesting range presumably reflects the availability of food. Olive ridleys are carnivores, feeding primarily on mollusks, fishes, jellyfishes and crustaceans.

In Malaysia, information on the nesting status of this species is fragmentary with records available only for Terengganu, Pahang, Perak and Pulau Pinang (Sukarno et al., 1993). The major nesting sites in Terengganu are Kuala Baru, Telaga Papan, Pulau Kapas, Dungun, Paka and Geliga. In Perak and Pulau Pinang, the nesting sites are Pantai Segari and Pantai Keranchut in respective states. Nesting has also been recorded in the Turtle Islands of Sarawak and Sabah. The peak period of nesting season for this species in general is from February to May.

In Thailand, nesting sites of olive ridley are on the coast of the Andaman Sea, especially along the west coast of Phang Nga and Phuket Province and the adjacent islands. However, population size had declined from 238 in 1979 to 77 nests in 1993 (Chantrapornsyl, 1993). A small population of hawksbill is also located in Trang Province.

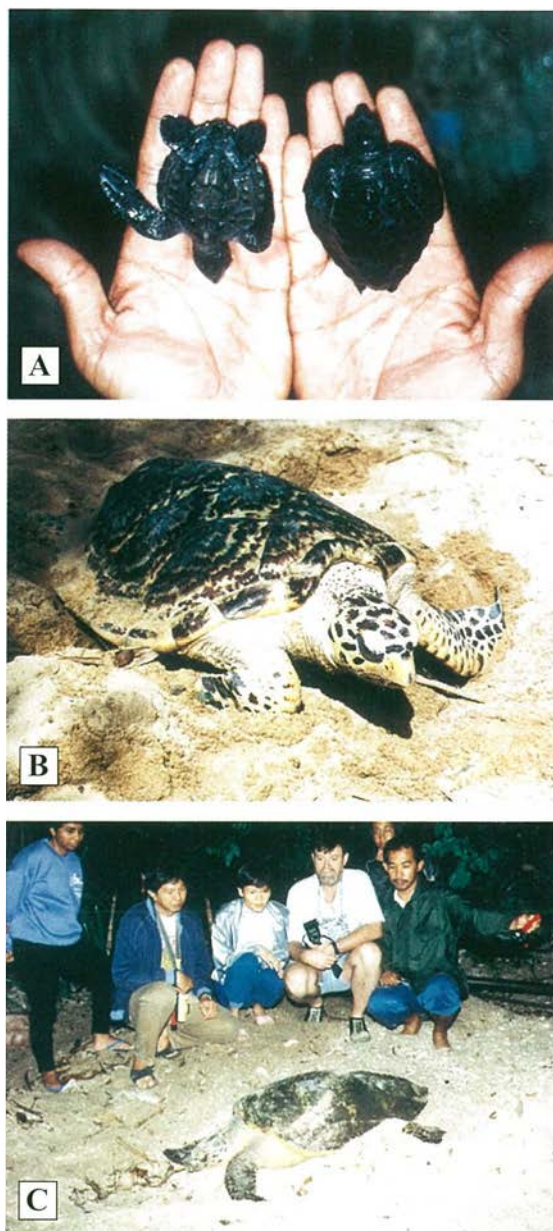


Plate 27. A-Hatchlings, B-Juvenile and C-Adult Hawksbill Turtle

Olive ridleys are not a common sea turtle found in the Philippines. Sightings of olive ridleys were recorded from the waters off Palawan and Metro Manila. Most recently olive ridleys were reported to nest in the former US Naval Base in Subic Bay, Sambales. Meanwhile, in Indonesia, olive ridleys were confirmed to nest in Pantai Padang in Padang, Bengkulu, Nusa Kambangan in Central Java, Sukamade in East Java, Paloh in Kalimantan, Bualu in Bali and Pantai Utara Kepala Burung in Irian Jaya. No information is available from Vietnam.

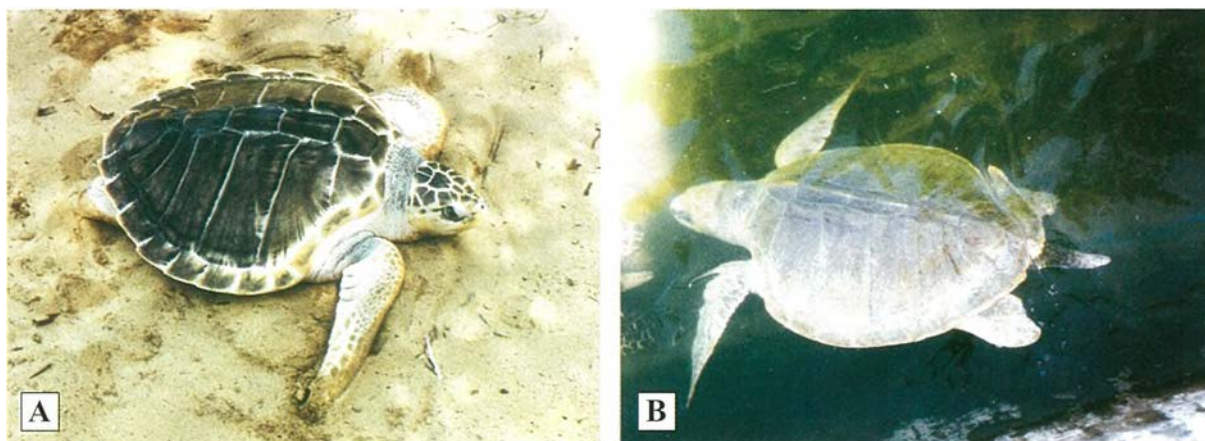


Plate 28. A-Juvenile and B-Adult Male Olive Ridley Turtle

Loggerhead Turtle (*Caretta caretta*)

Loggerhead is characterized by typically five pairs of lateral scutes, the anterior-most one touching the cervical, ventral scutes broader than long and three poreless inframarginals on bridge. The carapace is red dust-brown. The head is comparatively large. Two claws occur on the forelimbs, males have thick tails extending beyond the edge of the carapace. Adults generally weight 80 to 150 kg. The worldwide average CCL for adult female is 95 to 100 kg. Adult males in Queensland measured with an average 95.8 cm CCL and 100.7 kg. Mating often takes place in adjacent waters to nesting beaches. The clutch size averages 110 eggs. Eggs hatch in about 45 to 65 days. The loggerheads reach maturity at the age 12 to 25 years and the mean nesting female is 92 cm SCL. The range of migration for loggerhead in this region is more toward Southern Pacific covering Indonesia, Philippines, Eastern Australia, Solomon Island, Papua New Guinea and New Caledonia (Limpus, 1993).

Within Asia, large nesting concentrations of loggerheads are outside the ASEAN region, in Australia and Japan. Normally, loggerheads nest on temperate beaches (Ekert, 1993). In Sarawak, Malaysia loggerheads were reported to nest in small numbers (Leh, 1989). In Peninsular Malaysia, the occurrence of loggerhead was not mentioned. Loggerhead turtles are encountered on the beaches of South and Central Sulawesi and Ambon Island in Maluku. In the Philippines, the most recent discoveries of loggerheads were from Batan Island and Albay. In Vietnam, they are distributed from the Central Sea area of Vietnam (Provinces of Quang Ngai, Binh Dinh, Khanh Hoa, Ninh Thuan, Binh Thuan, and Vung Tau) southward to the South Sea area (Phu Quoc Island Con Dao archipelago and Truong Sa Archipelago) and the Gulf of Thailand. This used to be a very commonly-seen species with the highest numbers of the turtles in Vietnam.

Flatback Turtle (*Natator depressus*)

The flatback is a close relative of the green turtle, distinguished by its smaller size and flatter carapace. The flatback is only found in northern Australia and northwest Irian Jaya. The curved carapace length is in the range of 80 to 100 cm and the curved carapace width is 70 to 80 cm. The nesting female lays eggs between 30 to 80 per clutch and the mean nest depth is 50 cm. Flatback turtles lay up to four clutches at 15 night intervals.

The flatback turtle is endemic to the Australian continental shelf (Limpus, 1996). Flatback nesting concentration occurs throughout Australia. The feeding area extends to Papua New Guinea and Irian Jaya.

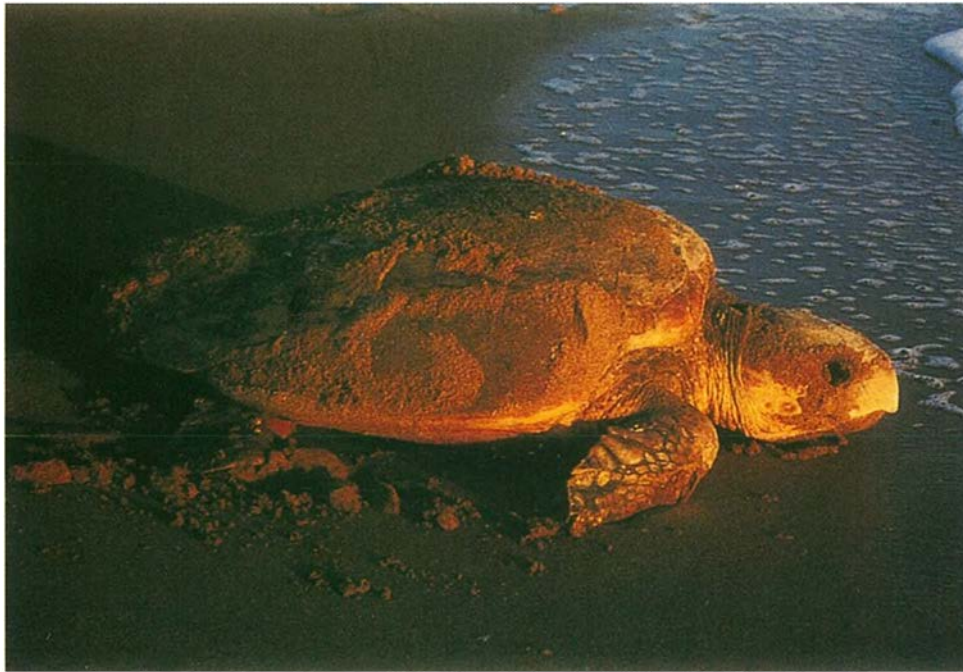


Plate 29. Adult Loggerhead Turtle (Photo Credit: Ian Beattie/Auscape)

