

SEA TURTLE RESOURCES IN THE ANDAMANS<sup>1</sup>

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## INTRODUCTION

Of the 7 existing species of sea turtles found in the oceans of the world, 4 occur in the Andaman Sea ; they include four of five existing genera of sea turtles. All four are presently known to nest in the Andamans. Among them is the largest and rarest of sea turtles, the leatherback turtle. This turtle has been listed in the International Union for the Conservation of Nature (IUCN) Red Data Book for species immediately threatened with extinction. All Indian sea turtles are totally protected by law, having come under Schedule 1 of the Indian Wildlife (Protection) Act in 1977.

The presently known status of Indian sea turtles is summarized below :

Zoological Name	English Name	Status in Indian seas	World wide status
<i>Lepidochelys olivacea</i>	Olive Ridley Turtle	Very common	Not uncommon but declining rapidly
<i>Chelonia mydas</i>	Green Turtle	Common	Common but declining rapidly
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	Not Common	Exterminated over most of their original range
<i>Dermochelys coriacea</i>	Leatherback Turtle	Common only in the Andamans	Uncommon

Sea turtle meat and eggs constitute an important food source in many countries. Turtle soup prepared from cartilaginous tissue called calipee is widely relished. The horny laminae on the shell of the hawksbill turtle are converted into highly priced curios. Turtle fat is used as a remedy for a variety of ailments and as caulking for boats. The hide is converted into shoes. If nesting occurs in sufficient concentrations, sea turtles could promote tourism. Carefully supervised 'turtle

watching nights' (i.e. the organized observation of sea turtles as they come ashore and nest) have become popular tourist attractions in Australia and Malaysia. Aesthetic reasons apart, the uses cited above make it well worthwhile for us to protect and preserve sea turtles, whose populations have taken a downward plunge ever since man and dogs commenced colonizing their remote nesting areas, collecting their eggs, 'turning' them on land and netting, spearing and hooking them indiscriminately at sea. Dogs scent and excavate turtle eggs with disheartening efficiency. Turtle nesting beaches have literally been trucked away for construction purposes, as has occurred, for example, on the Betapur coast in Middle Andaman.

The Snake Park is currently carrying out a sea turtle survey in the Andamans and offshore islands. So far Great Andaman and Little Andaman have been surveyed.

## SEA TURTLE SURVEY FINDINGS IN LITTLE ANDAMAN

The Island was surveyed from 29th December '78 to 5th January '79 by the Madras Snake Park Field Officer. Data were collected in two ways : (1) Walking the seashores of the island in order to locate turtle

<sup>1</sup> Invited Paper.

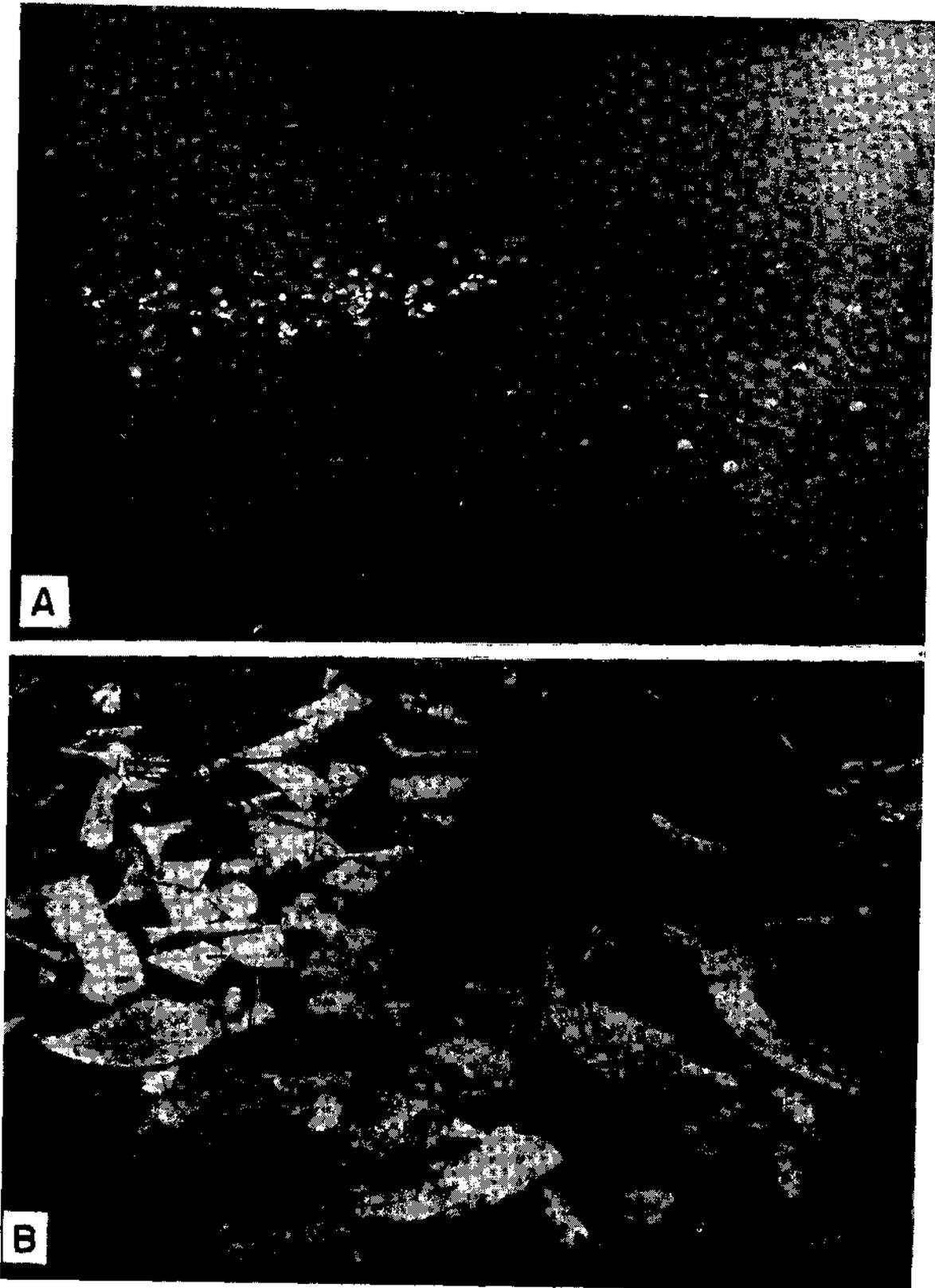


PLATE I. A. Sea turtle eggs are dug up and eaten by dogs, pigs, monitor lizards and man. B. Skulls and bones of green sea turtles caught for meat near Wandoor, South Andaman. (Photos by S. Bhaskar)



PLATE II. The eggs of hawksbill are the smallest of sea turtle eggs in the Andamans. (Photo by S. Bhaskar)

nests, excavations, tracks, carcasses, skeletal remains and egg shells and (2) interviewing settlers and Onges who fish and hunt for a livelihood.

Most excavations of four species were found on Little Andaman, with leatherback nests preponderating. The breakup was as follows :

Species	No. of excavations
Leatherback	82
Olive Ridley	4
Green	3
Hawksbill	1

While nests of the Ridley, Green and Hawksbill turtles are often encountered on the coasts of mainland India and on offshore islands, the last confirmed account of a leatherback nesting dates back to 1928 at Quilon, Kerala where no nesting has occurred since, on account of predation by man on eggs and adult turtles.

Of the 82 leatherback excavations (meaning 82 nests, in all probability) about 15 had been made during or immediately prior to the week of the survey i.e. around late December '78 and early January '79.

On the night of 31st December a leatherback turtle was observed as it nested at West Bay, Little Andaman. This is the first occasion in 50 years that leatherback nesting has been observed and recorded on Indian soil.

Leatherbacks grow to 2.5 m in length and over 1000 kg in weight. The individual observed in Little Andaman measured almost 2 m in length and left a track 180 cm in breadth as it crawled up the beach sand. Large leatherbacks leave tracks reminiscent of those made by a tractor well over 2 m broad. The eggs (white in colour, encased in a flexible parchment textured outer skin) are laid and buried 60 to 75 cm below ground level in moist sand (temperature roughly 25°C) usually on broad sandy beaches at or above the spring high tide line. Roughly 100 eggs are laid, most of them with a diameter of 51 mm, larger than those of other sea turtle species that occur in India. The area excavated by the nesting turtle may measure 15 m by 3 m (the surveyor carefully reburied all eggs after measurements had been taken and data collected).

In spite of the leatherback turtle's impressive open-sea swimming ability and its far-ranging habits (the species is found in all but the coldest seas), only three large nesting concentrations are known to exist, to date : at Trengganu (Malaysia), Surinam and Costa Rica.

It would be rash to assume, in the absence of more detailed investigation, an aggregation of comparable magnitude in Little Andaman. However, this possibility cannot be ruled out in view of the fact that the duration of the nesting season, its peak period and intensity have yet to be ascertained.

'Natural' predation on turtle eggs by monitor lizards and, possibly, by wild boar and civet cats exceeds 80% of the clutches laid, as was evident from the numerous occasions raided nests (with empty turtle-egg shells strewn about) were encountered (Pl. I, A). Monitor lizards were observed as they excavated turtle nests on four occasions. Wild pig and civet tracks were often found around turtle nests. Presumably this degree of natural predation has kept the leatherback population in a state of dynamic equilibrium—a situation which could easily be upset by the encroachment of man (and, inevitably, dogs) on turtle nesting beaches. This has evidently occurred at Hut Bay where fishermen state that nesting has dwindled and almost ceased over the past decade. The presence of only one leatherback excavation in Hut Bay during the survey period, in spite of the availability there of otherwise suitable nesting habitat, reinforces this belief. Today, nesting preponderates on the virtually undisturbed West Bay, South Bay which is visited occasionally by fishermen, predictably harbours a smaller nesting population.

Of vital importance for the continued survival of the unique Little Andaman leatherback population is the need to protect the beaches at West Bay and South Bay from all human intrusion, at least until these areas can be effectively and regularly patrolled by law enforcers. Under no circumstance should dogs be allowed to be brought to these areas.

The traditional hunting of turtles by Onges, may, however, have no adverse effect on the turtle population because of the antiquity of this interaction and the small scale on which it occurs at present. Onges spear sea turtles for consumption using a hand-propelled wooden harpoon with a detachable metal spike head. The green turtle is the species usually hunted. The imminent construction of a motorable road from Hut Bay to the vicinity of Jackson Creek will greatly jeopardize the existence of the West Bay nesting population. Crocodiles, reputed to occur in numbers in the area will be similarly threatened.

Follow-up surveys are necessary in order to collect more accurate and quantitative data regarding sea turtle nesting seasons, nesting populations and their fluctuation, sea migration routes, egg laying frequency, biology etc., with a view to conserving this resource.

## SEA TURTLES IN THE SOUTH ANDAMAN ISLANDS

### Areas surveyed

1. The coasts of the main island of South Andaman barring those along the Jarawa Tribal Reserve.
2. The Rutland Island coast excluding its eastern face.
3. The 12 small islands that form the Labyrinth group which lies off Wandoor, South Andaman.
4. The Twins, two islands situated approximately due west of Wood-Mason Bay, Rutland Island.

Period of survey : 7 October to 4 November '78.

Prior to the Government ban in October '77 on the killing of sea turtles and on the collection of their eggs, turtles were actively hunted by fishing communities from the small townships of Maymyo and Wandoor (Pl. I, B).

Wandoor became the largest 'turtle depot' and butchering centre in South Andaman, where sea turtles that had been speared using hand-propelled harpoons or, less frequently, caught in nets or while nesting were brought and carved up before transportation to Port Blair where the meat fetched Rs. 3-5 per kg. Turtle eggs were consumed locally and occasionally sold for 5 paise a piece.

The turtle species usually killed for meat was (and to some extent still is) the green turtle (*Chelonia mydas*), as was evident from the presence of 34 *C. mydas* skulls at Wandoor in September 78, a year after the ban. Juveniles as well as adults were taken. The skull width ranged from 9½ to 13 cm and averaged 11½ cm.

Local estimates of the catch before October '77 range from 5 to 20 turtles during fishing days, the number of which is curtailed mainly by the prevalence of the south-west monsoon. Fishermen of Bengali origin who are reputedly experienced in the use of sails and adept at wielding harpoons state that the heaviest nesting occurs during August but do not state the species involved. At least 3 other species occur in the Andaman sea—the hawksbill (*Eretmochelys imbricata*), Ridley (*Lepidochelys olivacea*) and the leatherback (*Dermochelys coriacea*).

Hawksbills in South Andaman nest well into October (at least)—23 sets of fresh hawksbill tracks were found on the Twins, known locally as Kachua Tikeri (turtle Island). The Twins were the most remote of the areas surveyed but even so fishermen occasionally undertake the 3 to 7 hour journey from Wandoor and other coastal

hamlets expressly to collect turtles and their eggs. Evidence of this was the presence of a stripped carcass of a green on the Eastern Twin island and many turtle egg shells strewn nearby.

Fishermen hesitate to use nets in the shark infested waters around the Twins. On a broad, kilometre-long sandy beach on Rutland Island directly opposite the Twins, both sets of green turtle tracks visible had been made by a turtle lacking the left fore-flipper—in all likelihood the result of a shark attack. The time elapsed between the laying of the two clutches probably represented an inter-nesting interval for the turtle, roughly a fortnight. Another green nest site visible nearby but with tracks obliterated may have been excavated during a still earlier nesting venture by the same turtle. If so, she must have first come ashore to nest about mid-September. This evidence is of course too meagre to delineate the green's nesting season in the Andamans.

Also on the same beach was a fresh hawksbill nest and 5 leatherback egg shells scattered over a 75 m front. Of these 5, 2 were intact and unbroken and, though discolored and desiccated, retained their roughly spherical shape, thus facilitating a rough measurement of their diameters. One of these contained the remains of a hatchling's carapace. The fact that the other did not, makes it likely that the eggs came from different clutches (75 m of sand carpeted by sparse vegetation and separating the two eggs reinforces this possibility). The two intact eggs exclude predation and the likely explanation for their presence on the sand surface is that they were uprooted inadvertently by another nesting turtle of the same or different species. If correct, these presumptions lead one to the exciting possibility that the beach was, sometime during the previous few months, a reasonably heavily nested area used probably by leatherback, because these large turtles dig deeper body pits and egg chambers than other species do and are therefore more likely to accidentally excavate other nests. Though suitable as a leatherback nesting site (being sandy and remote), this beach which lies immediately south of Wood-Mason Bay offered no other signs of digging activity by leatherbacks; but the excavations could have been obliterated during the south-west monsoon months (the beach faces west). About 5 km away were two leatherback nest sites excavated about 2 months earlier, i.e. in July or August, on a little disturbed beach on Rutland's southern coast.

About midway between the beaches mentioned were 6 sets of fresh hawksbill tracks on a 1 km wide front. This narrow beach is remote and fringed by tall panda-

nus. There was evidence of 5 nests. Of these, three had lately been robbed by monitor lizard (*Varanus salvator*). Unlike dogs and jackals, monitors leave behind few, if any, egg shells. The surveyor's visit surprised a 0.75 m monitor as it rested on a turtle nest after eating all the eggs. It was sluggish in making its getaway after the heavy meal. There were abundant monitor tracks on Rutland's beaches and on the larger Islands of the Labyrinth group, especially on Tarmugli and Redskin, where nesting occurs, as also on Boat Island.

Wild pigs inhabit Rutland Island but no evidence of predation by them on turtle eggs was found. The relatively heavy nesting on the Twins is at least partly attributed to the absence of monitors there.

Data relating to the green and Ridley turtles are each from a single nest; the hawksbill figures are average values from 4 clutches (Pl. II). The leatherback egg diameter is the average of 2 dry but intact eggs found on a Rutland beach. This is the first definitive evidence of leatherbacks nesting in the Andamans.

The representative figures suggest trends to aid in distinguishing between eggs of the four species. The overlap in egg size of the hawksbill and Ridley eggs prevent size alone being a criterion for distinguishing between eggs of the two species. Clutch size may overlap between any two of the species and is therefore even less distinctive.

TABLE 1. Egg size of sea turtles from South Andaman

Species	No. of eggs per clutch	Egg size, mm (Max. dimension obtainable)	Range in egg size, mm
Hawksbill	.. 139 (range-96-177)	34.3 (avg. of 8 eggs)	33.0-37.8
Ridley	.. 119	36.6 (avg. of 4 eggs)	36.2-36.9
Green	.. 93	41.8 (avg. of 2 eggs)	41.4-42.1
Leatherback	.. ?	50 (avg. of 2 dried eggs)	49-51 (dried eggs)

Sea turtle nesting also occurs on about 20 small, narrow debris-strewn coves on the rocky eastern coast of South Andaman island from Shoal Bay to Burma-nalla, but the density of nesting is low, at least during the survey period. A *Lepidochelys* nest was found in late October on a narrow sandy cove 1½ km north of Madhuban. There was also a fresh Ridley nest site and two older nest sites about 2½ km north of Madhuban. One of these had been raided by humans. The reported penalties for possession of turtle eggs (Rs. 5 per egg) and for the killing of turtles (Rs. 50) will serve as effective deterrents if the turtle protection laws are enforced rigidly.

Data on the egg size of the 4 species from South Andaman is given in Table 1.

#### RECOMMENDATIONS

1. One of the authors (S. Bhaskar) has made the first observation of leatherbacks nesting on the islands. *D. coriacea* is a rare turtle and its nesting beaches such as those on Little Andaman and Rutland should be identified and strictly protected.

2. Adequate wildlife staff and strict enforcement of the Wildlife (Protection) Act of 1972 would go a long way toward ensuring the survival of sea turtles in the Andamans.

3. Since turtles are an important protein resource mariculture possibilities should be investigated.

4. The fact that turtles are protected should be publicized in the islands.