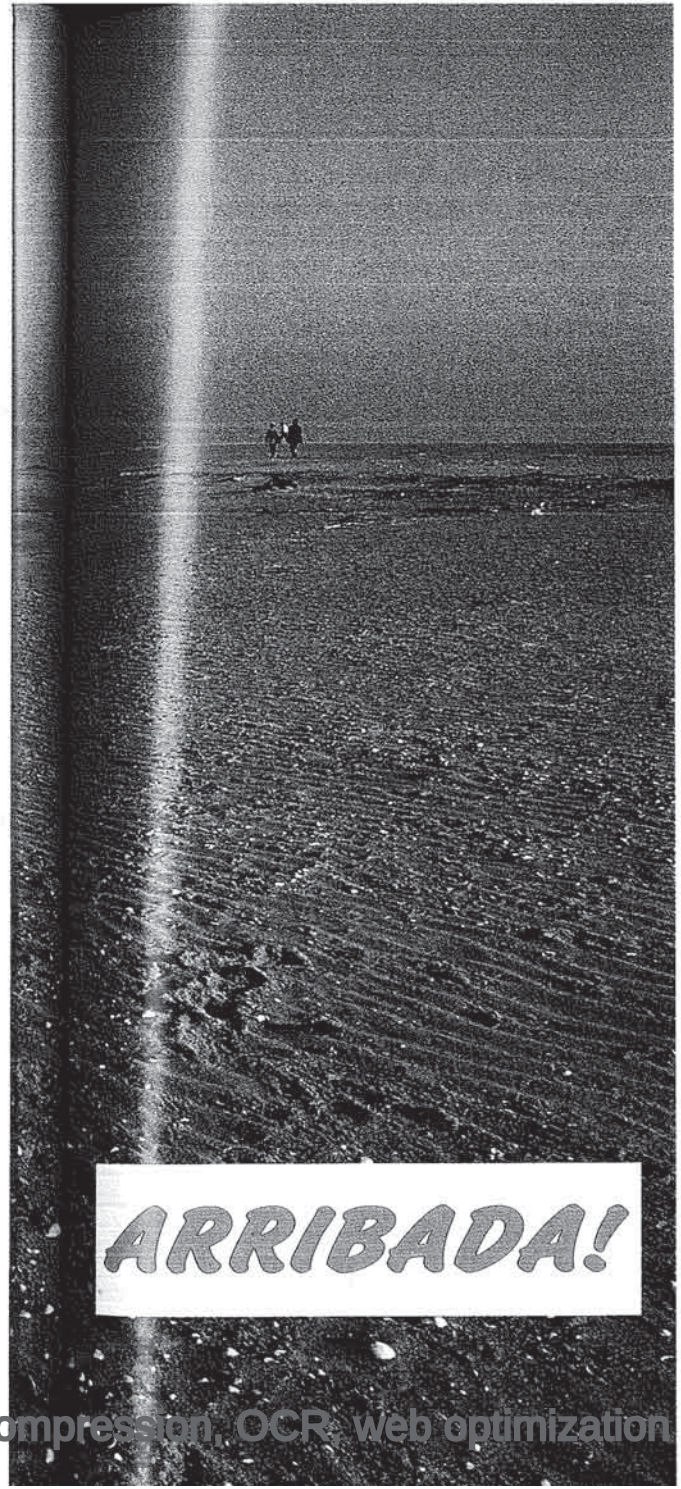
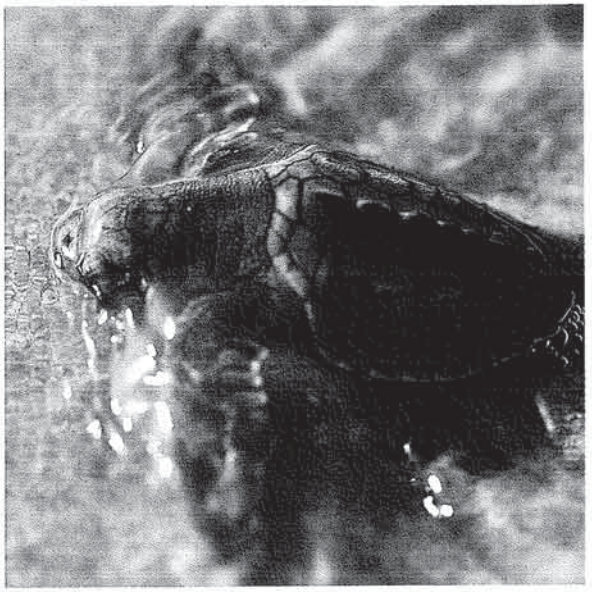


ARRIBADA!

Facing pix: *Welcoming with open arms!*
Below: *Returning to its own element*

They mate, they visit our beaches and then they go away. These 'tourists' however, leave behind more than just 'footprints' on the sandy stretches of Orissa's coast. They leave behind another generation of NRI's in the making. **Kartik Shanker** ***reports on the*** **arribada** ***of the Olive Ridley turtle.***



A TINY hatchling scrapes open its shell with its little egg tooth and scrambles out into a sandy world. Two inches long and weighing less than 20 grams, it finds itself one and half feet below the sand and in the company of a hundred other pushing, heaving hatchlings. The hatchlings wait as their siblings proceed to shed their calcareous coats.

A while later, the temperature drops—it must be night in the outside world, dark enough for the freedom-run to the sea. As they start moving about energetically, the sand slowly filters down, the nest collapses and the hatchlings find themselves moving towards the surface together.

They emerge together and wait but briefly to determine the brighter horizon, the sea with the moon and stars reflecting off the water surface and then rush and tumble down the slope, feel the beating of the waves ahead of them and all of a sudden, they are in the water—where they truly belong.

In seconds, other instincts kick in and the hatchlings dive under the incoming waves and ride out with the current. Their first response is to swim against the waves' direction which ensures that they reach offshore waters. The yolk sac that they have absorbed in the days prior to emergence gives them the energy to swim without pause for a few days and this juvenile frenzy ensures that they reach safe havens in the sea. By the time they have reached seaweed rafts and caught offshore currents, the hatchlings have become oriented to the Earth's magnetic field and this enables them to maintain their sense of direction.

Those who have survived the dogs and crabs on the beach and the myriad predators that have waited to feast on them in nearshore waters, will be at the mercy of oceanic currents for the next ten to twenty years of

their lives. One in a thousand will survive to adulthood and join other adults of the parental population at a feeding ground thousands of kilometres from the place where they had hatched. When they have matured, the males and females will use the Earth's magnetic field to migrate back to their natal beaches to breed and nest and start the cycle again as they have done for millions of years since the time of dinosaurs.

Unfortunately, however, many of them, having survived the travails of oceanic travel during their youth, will be caught in trawl-fishing nets and drown—a tragic end to a magnificent animal.

Marine turtles are fascinating creatures whose adaptation to the marine environment is total. Their languid grace in the water is almost balletic. They have beautifully streamlined bodies, long fore flippers and a physiology that frequently defies biological wisdom. They can survive for long hours while diving, accumulating toxic waste in their tissues, enabling Leatherback turtles to dive several thousand feet (one of the deepest diving of vertebrates) and Loggerhead turtles to hibernate for months underwater during winter. They undertake enormous oceanic migrations and navigate with the help of geomagnetic stimuli. Green turtles are able to locate Ascension island, a mere speck in the middle of the Atlantic, while Loggerheads undertake migrations of over 10,000 km from Baja California to Japan.

The only weak link in the sea turtle's life is its breeding season when the females have to come ashore to nest and this has been exploited mercilessly by man. The poaching of eggs and adults onshore and the capture of adults in offshore waters for meat and shell have for long been the major cause of mortality for these creatures. Thousands of turtles were once shipped from the coast of Orissa to Kolkata, piled high on their backs in the open coaches of good trains, mostly alive, so as to not require refrigeration. The beautiful shell of the

Hawksbill was used to make spectacles and combs and other tortoise-shell ornaments. The shells were sometimes peeled off their backs when they were still alive in the belief that they might grow back again. However, in recent times, the take as incidental catch in shrimp and fish trawling nets is the greatest cause of mortality of sea turtles.

There are two species of Ridleys—the Kemps Ridley and the Olive Ridley. Both these species are unique amongst turtles for the phenomenon of mass nesting or *arribada*, when thousands of turtles come ashore simultaneously to nest. The Kemps Ridley is in fact, known from a single population at Rancho Nuevo, Mexico, which was depleted from about 40,000 animals to a few thousand in the 1980s, mostly due to indiscriminate poaching of adults and eggs. Kemps Ridleys are unusual amongst turtles in that they nest during the day, making it even easier for poachers to harvest them for meat and eggs. In yet another shameful episode of man's behaviour towards wildlife, poachers stalked these Kemps Ridley beaches, cutting off the flippers of nesting turtles, leaving the animals to die and the carcasses to rot on the beach.

The Olive Ridley is more widespread than its cousin, nesting both solitarily and *en masse* and is the only species that nests on the east coast of India. While solitary nesting is done along much of the coast, there are three major mass nesting beaches in Orissa, the largest being at Gahirmatha, where several hundred thousand turtles have been known to nest in a single *arribada*.

However, mass-mortality of adult turtles in trawl-fishing nets and the fragmentation of the nesting beaches have led to a decline in their populations in Orissa. Mortality due to trawling nets is particularly galling—they are trapped as incidental catch, since the turtles are no longer used and discarded. Sea turtles usually dive for about an hour but trawl-nets are operated for much longer and the added stress results in death by drowning. Conservationists all over the world have been trying to get trawlers to use turtle excluder devices (TED), trap doors which allow turtles to escape while there is no loss of fish catch. In many countries, the use of TEDs is mandatory but in India, the trawl fishermen are convinced that TEDs will lead to a major loss in their catch. Orissa already has laws which ban all mechanised fishing within 5 km of the shore but the laws are not enforced.

Mechanised fishing has hit local traditional fishing communities as badly as it has hit the turtles. Most of them live at the edge of poverty and try to supplement their meagre take from other sources. Some of them capture prawn seedlings on the coast using fine mesh nets and this obstructs turtles from coming ashore to nest. In any case, excessive capture of seedlings from juvenile areas cannot be good for the prawn populations either. However, these fishermen have been victimised by the mechanised trawlers on one side and ironically,

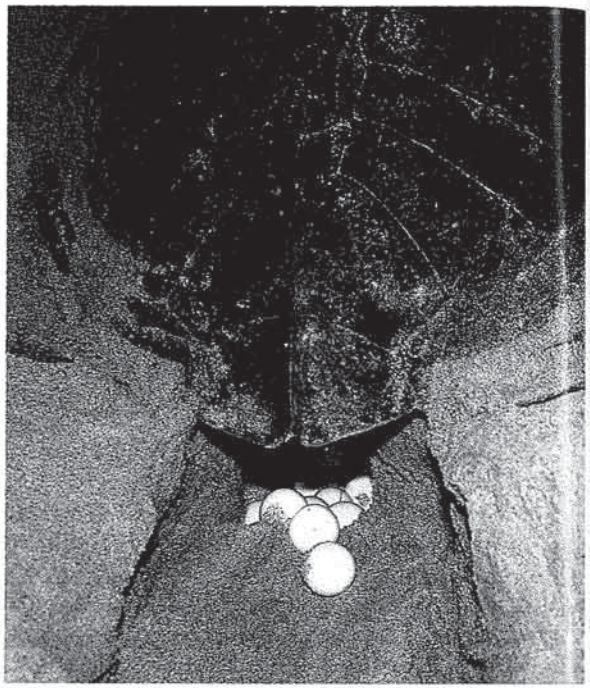
Left: *The nesting frenzy!*
Right: *Eggs being laid*

conservationists on the other, even though they share a common objective with the latter.

Marine turtles have also had to adapt the changing coastline in Gahirmatha. In 1989, a cyclone separated the nesting beach from the mainland and a 10 km beach was reduced to a 4km-long island, which by 1999, was reduced to two islands about 2 km length and not more than a hundred metres wide each. Over 90,000 turtles have been killed by trawl fishing since 1994, with the count rising to about 15,000 dead turtles each year since 1998. No mass nesting occurred in 1997 and 1998 and the future looked bleak for these turtles when biologists started field-work in late 1998. Through December and January and February, thousands of turtles washed up dead on the Orissa coast.

Since not all turtles that drown in trawl-nets are washed ashore, the actual mortality is likely to be even higher than the number counted. On a single afternoon on a small island near Dhamra, we counted 400 fresh dead turtles. Carcasses littered the beach, at various stages of decay, in various postures of supplication, seeming to plead to some benevolent force of Nature, that did not heed their call. Many were half-buried in the sand while others lay piled in the intertidal zone, where the waves beat upon them and flung them further up on to the beach. There they lay, helpless fodder for crows and dogs, ghost crabs and fiddler crabs, whose vibrant red gleamed in stark contrast to the dull grey of death.

At night, we surveyed the Ekakulanasi island, where turtles came up almost reluctantly to nest, an exceptionally large number of emergences were non-nesting crawls and the likelihood of mass nesting seemed remote. In the last week of March, as field biologists landed at Ekakulanasi, now no more than 50 m wide at places, on a routine survery, the turtles started to come ashore to nest . . . and kept coming and coming. Thousands and thousands came ashore that night, all through the next day and the night after that.



When we approached Nasi, there was sand flying over the dunes and thousands of turtles crawling on the other side. They were coming ashore, searching for a vacant spot amidst a sea of turtles, nesting and returning to the sea. Each turtle typically finds a suitable site, clears the dry sand away, digs a two-feet deep flask-shaped nest with her hind flippers, lays 100-150 eggs, fills it with wet sand, thumps her nest down with

Hatchlings rush out to sea

rocking motions of her body and then flings sand around to camouflage the site. Many turtles inadvertantly dug up the nests of other turtles and some died of dehydration searching for nesting sites in the hot sun.

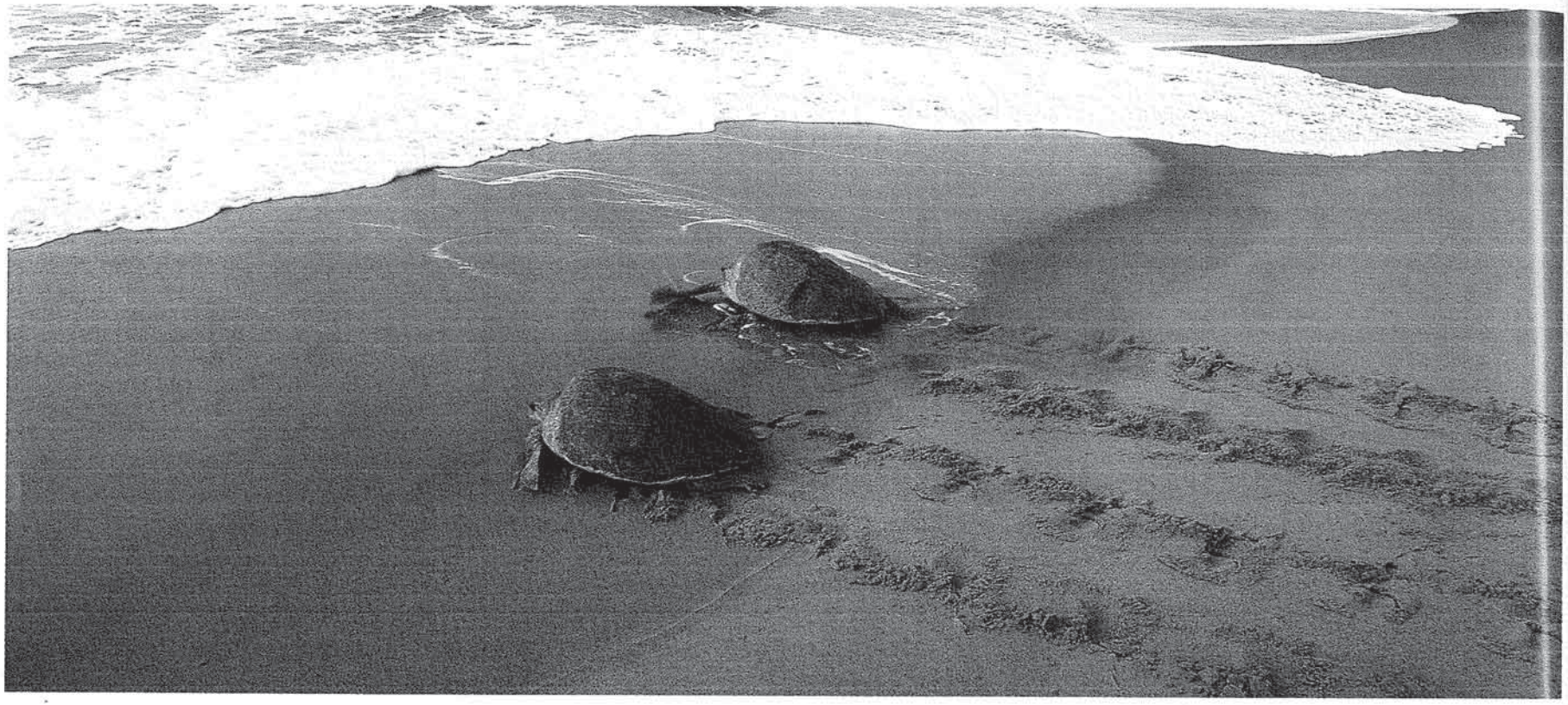
The orgy of turtle-nesting lasted nearly a week and a total of about one hundred and eighty thousand turtles nested on the two islands. Many weeks later, the density of nesting dawned on us as we walked across the beach during hatching and our feet sank in with nearly every step, indicating a nest below. Unfortunately, one island was completely inundated by the spring tides in May and hundreds of thousands of eggs were exposed and destroyed.

The turtles have a hard enough time maintaining their populations in Nature, dealing with extremely low survival rates as juveniles and dealing with changing nesting beaches as adults. Their lifecycles need no further complications with trawling mortality, beach lights which disorient adults and hatchlings and pollution. Genetic studies have shown that these turtles are the ancestors of Olive Ridleys everywhere else and of immense conservation significance.

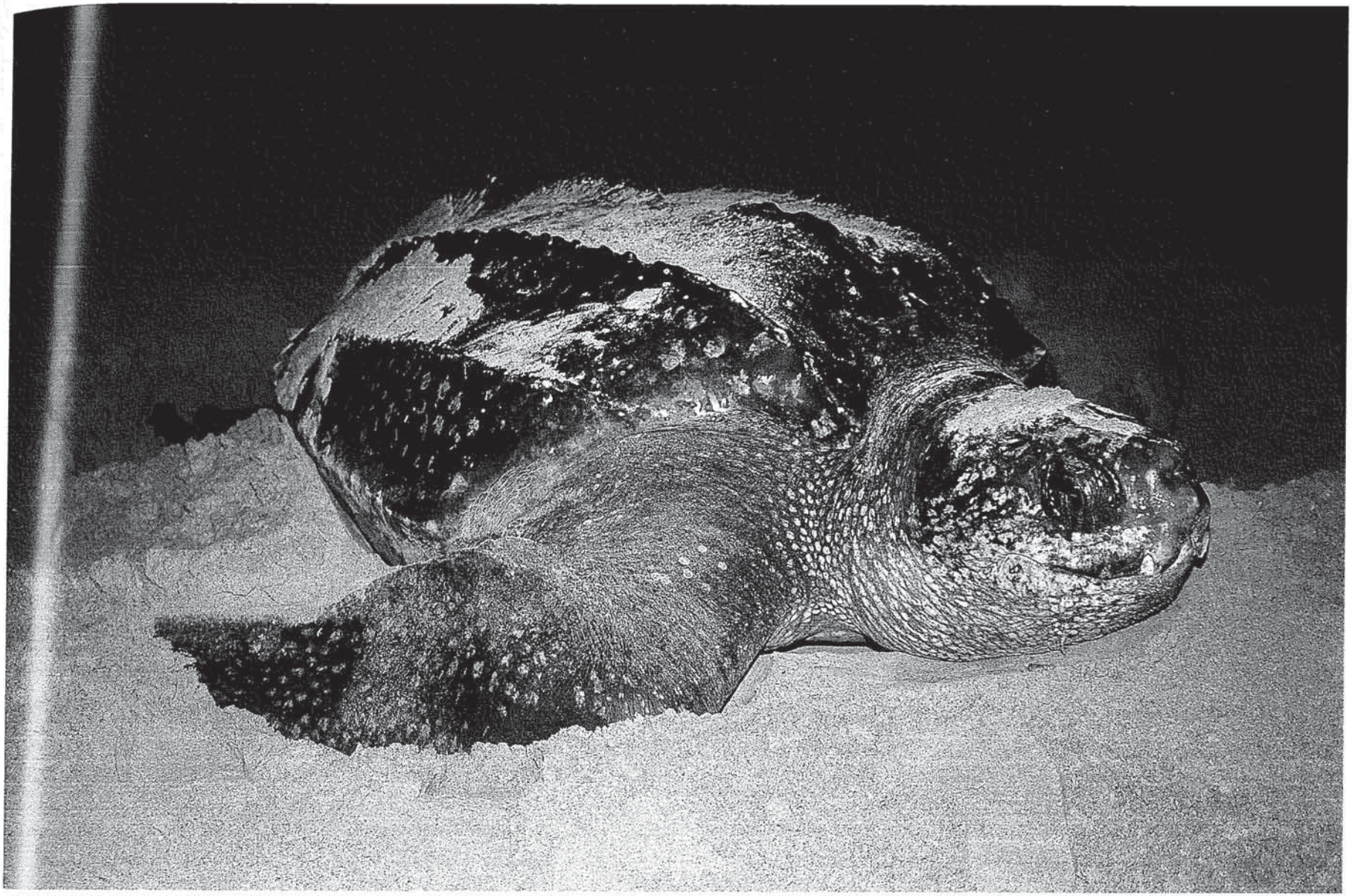
Though many turtles may still come up to nest, the current rate of mortality could easily lead to a collapse of populations, as has occurred in Surinam and Mexico.

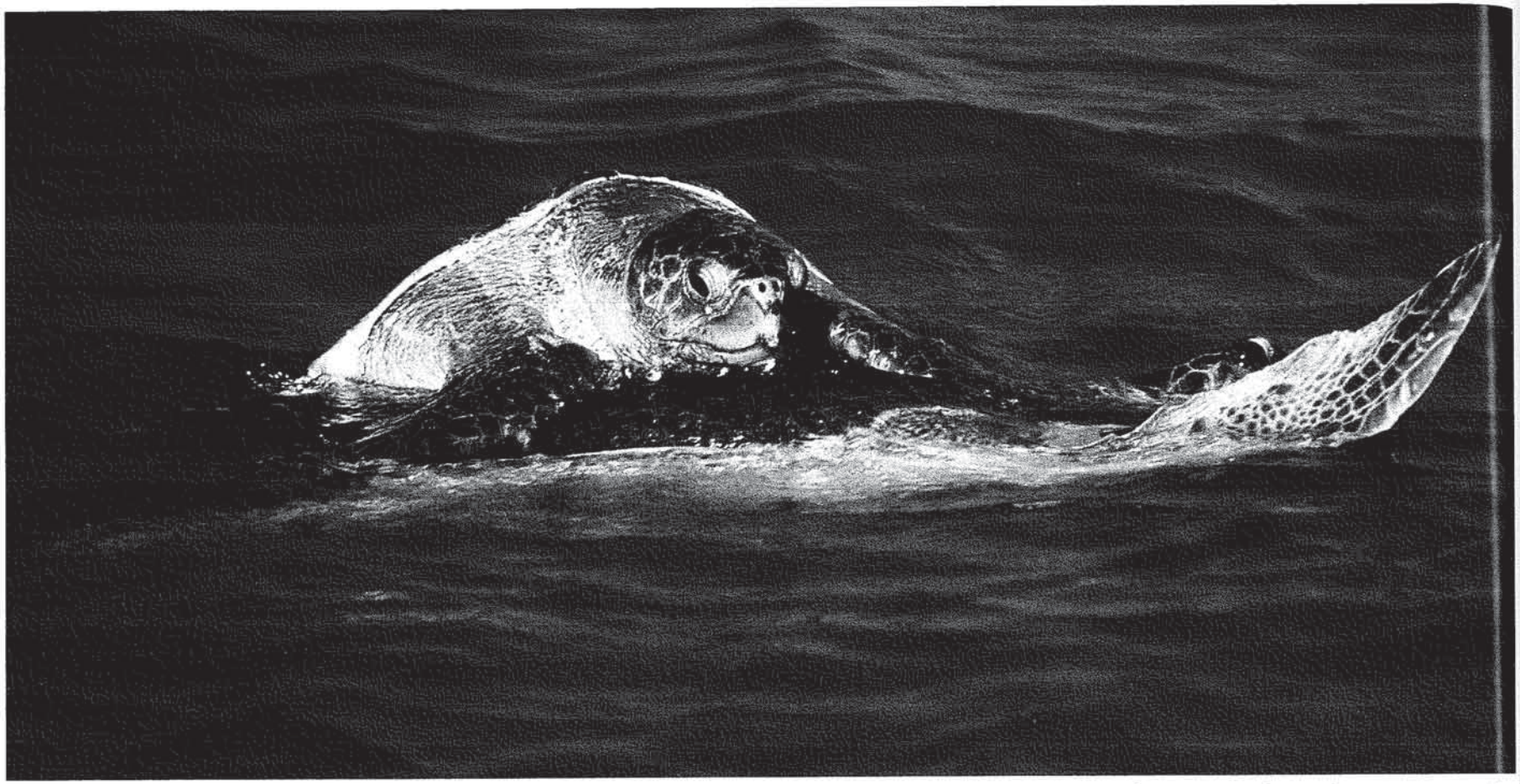
However, though numerous non-governmental groups and the government have attempted to find short and long term solutions for the conservation of a national heritage, nothing substantial has been achieved as yet.

Meanwhile, the turtles will start arriving again soon, we hope. It is up to us to find new solutions to deal with



Exhaustion writ large on her face





a species that poses new conservation issues. In 1999, the turtles nested at the mouth of River Barunei, a new site south of Gahirmatha, which was not part of the sanctuary. The coastal geomorphology of Orissa is constantly changing and perhaps the turtles will change their nesting habits accordingly.

We have to be flexible enough to accord them protection wherever they choose to nest. There is, after all, no point in protecting a stretch of sand in Gahirmatha, if turtles are nesting 50 km to the south.

Since sea turtles migrate thousands of kilometres in their breeding journeys, they traverse the boundaries of several nations. Satellite telemetry and tagging programmes have shown that at least some of the Orissa turtles feed off the coast of Sri Lanka. Consequently, protection in one country would be futile if they were being slaughtered in another. In that sense, sea turtles are transnational citizens—they are global ambassadors of conservation, beseeching people from all over the globe to work together for the future of the world as a whole.

—*Text & photography by* **Kartik Shanker**