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Project 1800  
Marine Turtles

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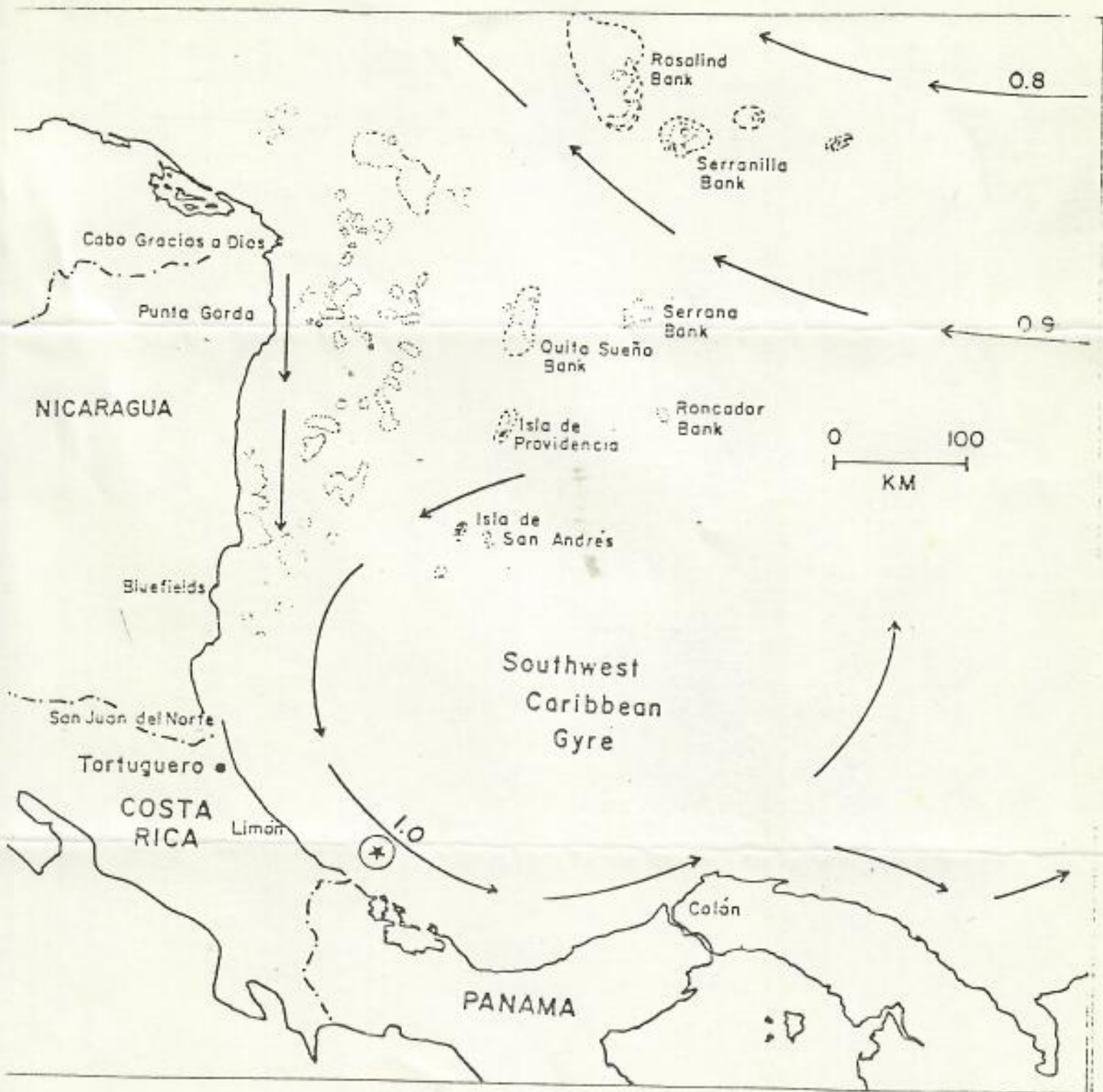
THE MYSTERY OF THE TURTLES' "LOST YEAR"



Baby turtle in sargasso weed

When a green turtle comes ashore to nest, she lays about 100 eggs and heads back to sea, leaving them buried in the sand. Sixty days later the baby turtles hatch out, erupt in groups from the sand and struggle to the sea. At that stage they are small enough to lie in the palm of the hand.

On the perilous journey across the open beach they are a prey to crabs, gulls and herons. As they plunge through the surf they meet with waiting predatory fish. Those hatchlings that survive to reach the open sea then simply vanish. No one knows where they go for the next year



The western Caribbean, showing the position of the Southwest Caribbean Gyre. The star marks the site where hatchlings were found in the sargassum drift line, having almost surely been derived from the Tortuguero nesting ground more than 100 miles to the north.

or so until they turn up again as adolescents, grazing on turtle grass along their native coasts, and now grown to the size of a dinner plate.

This is not only true of the green turtle, but of all marine turtles all over the world. Their "lost year" is a puzzle to scientists that has not yet been solved. It is a problem of considerable importance to developing countries in the warm water regions of the world. For the eggs and meat of marine turtles provide local peoples with valuable protein. If conservation measures are to be successful in keeping turtle numbers high enough to allow sustained exploitation, full knowledge of the turtles' life cycle is essential. And as marine pollution spreads, the lost year becomes more than just a regrettable gap in our knowledge of turtle ecology and becomes a serious obstacle to repairing the impact of such events as petroleum spills.

The most plausible theory to explain the absence of the first year young is that they take refuge in weed rafts drifting in the open sea. It was to test this theory that Project 1800 was organised.

Although data from any region are being sought, the project has concentrated on the Caribbean off the coast of Central America, and along the east coast of Florida and in the adjacent Bahamas. Research is focussed particularly on the area of Tortuguero beach (the name derives from the Spanish for turtle) in Costa Rica, which is one of the last strongholds of the green turtle (*Chelonia mydas*) in the Caribbean. Off the coast in this region is a circular current known as the Southwest Caribbean Gyre, in which lines of weed and rafts of sargassum revolve.

Sargassum weed is the name given to a number of species of brown algae that grow on rocky tropical shores. The

plants break loose in rough weather and drift about with surface currents, living on indefinitely and acting as hosts to a varied community of tiny larval creatures, fish, crabs, octopuses and sea slugs. Many plants get caught in the Gulf Stream and are swirled into the central north Atlantic, where they accumulate in the quiet centre of the currents. This is the place known as the Sargasso Sea.

The general aim of Project 1800 is to test the theory that weed rafts and drift lines are important during the passive migrations of marine turtles in their first year. The major sargassum zones in Florida and West Caribbean waters are being plotted and evidence sought to back up the theory that sargassum rafts act as a turtle hatchling refuge.

Stomach content analyses are being made to accumulate evidence that the hatchlings actually reside in sargassum rafts and do not just enter them casually or temporarily in their migration.

Dr Archie Carr, of the University of Florida's Zoology Department, who is the Project Executant, reports:

During September 1980, 2,000 young turtles were marked at the nesting ground of the green turtles at Tortuguero by notching marginal scales asymmetrically on the left and right sides, so as to provide recognisable specimens for later recovery. It is hoped to be able to corroborate that hatchlings picked up in sargassum off Panama or Colombia have travelled with the weed from Costa Rica and are not derived from separate nestings of stray females elsewhere up the coast. It is also hoped to corroborate that any post-hatchlings driven ashore on Tortuguero beach by heavy seas in January or February - which are out of the hatching season - have made one or more complete circuits in the Southwest Caribbean Gyre.

Although chances of finding any of such a relatively small sample are slight, they exist; and larger numbers will be marked in later seasons. Meanwhile the help of able local observers has been enlisted and \$25 reward has been offered in Panama and Costa Rica for any sea turtle of first year size - between six and 18 centimetres in length.

A systematic canvassing of local fishermen and navigators is being made to work out seasonal changes in local currents, as well as to collect any records of hatchlings sighted at sea.

In Florida, the stomachs of 110 post-hatchlings that were thrown up by storm waves have been examined. The stomachs of young loggerhead turtles (*Caretta caretta*) washed ashore in sargassum wrack at Melbourne, Florida, contained sargassum leaves and floats and recognisable parts of eight species of molluscs and crustacea, some of them known only from sargassum. This proves that the turtles were not merely swept in by the wrack, but had been living and feeding in it before the storms.

An intensive interview campaign has been carried out along the east coast of Florida, between Cape Canaveral and Miami, where the Gulf Stream comes closest to shore. The work in Florida has turned up numerous reports of young turtles in sargassum, offshore or in stomachs of fishes such as dolphins that habitually associate with weed mats. Several fishermen give convincing accounts of post-hatchlings being observed in numbers along the eastern edge of the Gulf Stream in February. Both the location of the sightings and the occurrence in February strongly support the idea that some young loggerheads may pass the lost year in a Floridian gyre, as green turtles appear to do in Costa Rica.

During the coming months, new efforts will be made to extend knowledge of the seasonal distribution of sargassum fields and weed lines, to multiply records of hatchlings in them and to gather evidence that the turtles remain in the rafts for protracted periods.

Surveys of sargassum fields and weed lines will be made in strategic areas. The inner edge of the Gulf Stream off the Atlantic coast of Florida will be carefully searched, especially along the southern peninsula where the current passes closest to shore. For these surveys small boats will be hired by the day from local fishermen. Longer cruises will be made off Panama and in the eastern edge of the Gulf Stream, north of the Little Bahama Bank. For these, sea-going craft will be chartered.

Direct observation will be supplemented by interviews with fishermen. Local residents will be engaged to walk the beaches after storms in search of young turtles in drifted wrack. At Tortuguero, where sargassum comes ashore in abundance during February, daily beach patrols will be organised and rewards offered for turtles of lost-year size.

The stomachs of sea turtles of lost-year size found dead on shore will be examined for food items that indicate residence in sargassum rafts.

During October, 1981, experiments will be conducted off Tortuguero to test the ability of newly-hatched turtles to hold continuous courses away from their natal shore and to show their behaviour on encountering mats of sargassum.

(From reports by Dr Archie Carr, Project Executant, Department of Zoology, University of Florida, U.S.A.)

## SUMMARY PROJECT DESCRIPTION - PROJECT 1800

- Title of Project: Sargassum-raft Reconnaissance - A Search for the Solution of the "Lost Year" Puzzle
- Project Executant: Dr Archie Carr, Department of Zoology, University of Florida, U.S.A.
- Objectives: The general aim is to test the hypothesis that weed rafts and drift lines of sargassum are important as habitat during the passive migrations of marine turtles of the first "lost" year of life. The specific objectives are:
- To locate and determine the seasonality of major sargassum zones in Florida and West Caribbean waters, and to plot the positions of the recurrent weed lines that seem most likely to be of ecologic importance to the Florida population of the loggerhead and the Costa Rican green turtle colony.
  - By direct search to document the reality of the sargassum raft as a hatchling refuge.
  - By direct search, experimentation, stomach content analysis and systematic interviews in the strategic regions, to accumulate evidence that hatchlings actually reside in sargassum as members of the adapted sargassum biota, and do not merely enter them casually or temporarily when encountered during their initial seaward migration away from the nesting beach.