

LIBRARY OF
GEORGE U. BALAZS

ARCHIE CARR, University of Florida

Grants No. 1491 (1952), \$500, and 1558 (1953), \$500. The zoogeography and migrations of sea turtles.

The present grants were used for making a survey of the rapidly diminishing nesting colonies and aggregations of green turtles in the Caribbean and in gathering data to extend knowledge of the breeding habits and migrations of sea turtles generally. Information was obtained, either by consultation with fishermen, turtle hunters, and fisheries officers, or by visiting nesting beaches, in the following places: May-June—Yucatán, Honduras, Costa Rica, Panama, Colombia; August-September—Venezuela, Trinidad, Tobago, Barbados, Antigua, Puerto Rico.

There follows a résumé of the more interesting results of the field work. Some of the points listed will be expanded in publications now in preparation.

1. Specific breeding-locality records (nests with eggs or nesting activity observed) were established for green turtle, *Chelonia mydas mydas* (Costa Rica, eastern Trinidad), hawksbill, *Eretmochelys imbricata imbricata* (Costa Rica, Tobago, eastern Trinidad) and trunkback, *Dermochelys coriacea coriacea* (Costa Rica, Tobago, eastern Trinidad).

2. The search for the Caribbean beaches now being used most heavily as nesting areas by green turtles showed that the northern coast of Costa Rica between the mouths of the Colorado and Parismina (Reventazón) rivers, especially a 15-20 mile strip eastward from Tortuguero, may be the most freely visited section of the mainland shore, and perhaps the most important single breeding site left in the Caribbean.

3. Although still an important site of nesting convergence, the Tortuguero beach cannot be regarded as a permanent source for the maintaining of green turtle populations. To support the export trade in green turtles the beach is rented in sections to contractors, who employ "veladores" among the local people to patrol mile-long strips and turn every turtle that comes up to lay. Periodically, a launch coasts along from Puerto Limón and picks up the accumulated catch. The females are not allowed to lay before being turned, despite the existence of a Costa Rican law requiring this, because the delay in waiting the half-hour or more of the laying process would cut down the number of turtles that could be taken in a night. All turtles not used locally along the thinly settled shore are carried to Puerto Limón for transshipment.

4. From a chartered small plane the grantee was able to see what was presumably the van of the green turtle "fleet" (*flota*) as it appeared off the Costa Rican coast. It is believed locally that the green turtles arrive en masse after migrating southward from the neighborhood of Yucatán. It was difficult to determine the basis for this idea and of

Reprinted from YEAR BOOK OF THE AMERICAN PHILOSOPHICAL SOCIETY, 1954
138-140

Printed in U. S. A.

course impossible to confirm it. Heavy laying had not begun by the time the grantee left Tortuguero in mid-June.

5. From the low-flying plane it was easy to distinguish between green, hawksbill and trunkback turtles, which were the only species seen in Costa Rica, although the loggerhead is well known there. Numerous pairs of hawksbills and green turtles were seen in copula just off the nesting beach, confirming the popular belief that copulation occurs at nesting time, either before or after the female lays her eggs or perhaps both. It has apparently not been previously recorded that during courtship each female is often found attended by two males. A large number of such trios were seen from the air.

6. The feasibility of making population and breeding censuses from a light plane was established. Not only is it practicable to make positive identifications from safe flying altitudes, but nesting tracks on the beaches can be readily seen and counted, affording valuable means of locating areas of concentrated breeding and of following migratory movements.

7. With the possible exception of Trinidad, nowhere in any of the localities visited was there evidence of the occurrence of the Atlantic ridley (*Lepidochelys kempi*), while in all these places the other four species are well known. This apparent absence of the ridley from the Caribbean adds another anomalous feature to the peculiar life history of this turtle.

8. On the northeastern coast of Trinidad, fishermen in several villages visited reported the occurrence of five kinds of sea turtles; and the fifth kind they described in terms strongly suggestive of the ridley. They agreed that it does not nest there (the breeding areas and habits of the Atlantic ridley are completely unknown everywhere) and turns up only rarely, and when the "South Atlantic current is strong." By this they presumably mean when recession of the Orinoco flood water allows the Equatorial Current to wash eastern Trinidad. This current is at least partly African water, some of which is from south of the bulge and some probably from the tail of the Canaries Current which is an extension of the Gulf Stream. Thus, the alleged Trinidad ridley might be derived from either of two sources: from Florida by the global circulation, or from a genetically slightly different population that inhabits the coast of West Africa northward to the Gulf of Guinea. The greatest disappointment of the summer's investigation was the grantee's failure to obtain a specimen of this ridley, inasmuch as the differences between the African and Florida stocks, though slight, are sufficient to permit the determining of the origin of any single specimen. Once the stranding of ridleys in the Lesser Antilles is established as a fact, a detailed study of the zoogeography of the Florida and West African ridleys in the area between the Azores and the mouth of the Congo should be made. Because of the distinctive features and mutually exclusive ranges of the two ridley stocks and their tendency to expatriation by currents, the tracing of stranded waifs should prove of the greatest importance

in the establishing of the courses and origins of some of the poorly understood currents of the Tropical Atlantic.

9. Previously reported heavy nesting of green turtles in Dominica and in Dutch Guiana proved to be unfounded. Except for the Tortuguero area, no sites of concerted nesting were definitely located, although two alleged breeding localities, Aves Island southwest of Dominica, and the Chiriqui coast of Panama, remain to be investigated.

The data gathered during the reconnaissance supported by these grants show clearly that the American sea turtles present problems of exceptional interest both from the standpoint of pure natural history and as potential subjects for the application of conservation practices. The green turtle seems to the grantee in a dangerous state of depletion in American waters; and yet it would seem to be at the same time most peculiarly amenable to conservation manipulations. It could almost surely be restored as an abundant source of protein in tropical seaboards where protein is scarce. Under present conditions, however, it seems probable that the green turtle will be extirpated from the Caribbean within twenty years.

Carr, Archie

2503

1954. The zoogeography and migrations of sea turtles.

Year Book of the Amer. Phil. Soc., pp. 138-140

Band 8