Breeding of a Pair of Pen-reared Green Turtles

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The green turtle, *Chelonia mydas* (Linne.), an over-exploited animal of economic importance, has long been of interest to researchers and conservationists. This species has been brought to the point of near extinction and is now rarely found in places where it was once abundant (Ingle and Smith, 1949; Carr, 1952; Carr and Ingle, 1959).

Among the efforts to save these turtles are those of Dr. Archie Carr and his associates who remove newly laid eggs from the beach at Tortuguero, Costa Rica and replant them in the immediate area in man-made nests. After hatching, the young turtles are released into the sea over a wide geographical range. While this may be successful in establishing new breeding places, the small, vulnerable turtles are still heavily preyed upon by various birds and fishes. Moorehouse (1933) suggested that the hatchlings be raised in impoundments. Tagging studies (Witham and Carr, 1969; Carr and Sweat, 1969) indicate that hatchlings held in pens until they are nearly one year old are able to adapt to a natural environment. Although diamond-back terrapins have been bred in captivity (Coker, 1906; Barney, 1922; Hildebrand and Hatzel, 1926; Hildebrand, 1929), there appears to be no mention in the literature of captive sea turtles breeding. The importance of breeding experiments for future farming operations is obvious (Carr, 1969).

Procedures and Discussion

As a part of the turtle conservation project at the House of Refuge Museum on Hutchinson Island, east of Stuart, Florida, efforts were made to hold a few hatchlings to maturity. Copulation by one pair of these pen-reared green turtles and subsequent egg laying are reported.

The female was hatched from a nest found on Hutchinson Island during the summer of 1958 (Carr and Ingle, 1959). Her mate was hatched from eggs shipped from Costa Rica during 1959. On 4 June 1969 the mid-dorsal carapace length (by caliper) of the male was 32.5 inches (825.5 mm); carapace width was 24.5 inches (622.3 mm). The female had a carapace length of 31.5 inches (800.1 mm) and carapace width of 24.0 inches (609.6 mm).

During April of 1968 the turtles were observed attempting to mate. The shallowness of the water in their tank (approximately 2 feet deep) prevented copulation. In the interest of the experiment, Dr. Robert Schroeder offered the use of his facilities in the Florida Keys and the turtles were taken there on 25 April 1968. While there, they were observed mating (Schroeder, personal communication) and thereafter the female crawled twice onto a beach adjacent to the pen. While on shore she made no effort to dig a nest. However, it has been suggested that eggs laid during a particular season were probably fertilized during a previous season (Carr and Giovannoli, 1957). The turtles were returned to the House of Refuge on 5 August 1968.

On the evening of 2 June 1969, approximately one year after mating, the female began laying eggs in the water. All eggs were recovered and immediately washed with fresh water. Of the 24 eggs recovered, 12 were normal (Ingle and Smith, 1949; Carr, 1952), measuring approximately 44 mm, and the others were undersized or malformed. Thirty-one eggs were laid on 2 July 1969 and 6 of these were normal. An additional 28 eggs, 7 of which were normal, were laid on 8 July 1969. The last eggs recovered were 24 laid on 1 August 1969 and only 10 of these were normal. Carr (1952) reported that young terrapins, *Malaclemeys terrapin terrapin* (Schoepff), produce fewer eggs than older ones. It is possible that this is also a factor in the small size of these clutches.

Twenty-four of the normal eggs (11 from the June 2 clutch, 6 from the July 2 clutch, and 7 from the July 8 clutch) were put into boxes of sand; none of these eggs hatched. This was probably due to the deleterious effects of immersion in seawater.

ACKNOWLEDGMENTS

I would like to express my appreciation to Messrs. Robert M. Ingle, Chief, Bureau of Marine Science and Technology, Edwin A. Joyce, Jr., Assistant Director, and Thomas Savage, of the Florida Department of Natural Resources Marine Laboratory, for their encouragement and suggestions. Dr. Archie Carr, University of Florida, is thanked for supplying eggs and hatchling turtles from the hatchery of Caribbean Conservation Corp., Tortuguero, Costa Rica, and for critically reviewing the manuscript. Dr. Robert E. Schroeder, Grand Cayman, B.W.,I., graciously provided the use of his fa-

cilities at Islamorada, Florida. The Martin County Board of Commissioners and the Martin County Historical Society are due special thanks for maintaining the facilities at the House of Refuge Museum. Mating efforts of the turtles were first observed by Mr. William Alloway of the museum staff, and Mr. and Mrs. Steve Bishop, also of the staff, observed the egg layings and recovered the eggs.

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Florida Department of Natural Resources Marine Research Laboratory, St. Petersburg, Florida. Contribution No. 161.