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STATUS OF TURTLES ON THE MISSISSIPPI COAST

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ABSTRACT Sea turtles have declined in numbers and federal agencies have become concerned with the numbers drowned in trawls by commercial shrimpers. Records are given of freshwater turtles and of the gopher tortoise in low-salinity waters. These include the Florida cooter *Pseudemys floridana*, the snapping turtle *Chelydra serpentina*, the alligator snapper *Macrolemys temmincki*, and the gopher *Gopherus polyphemus*. The diamondback terrapin *Malaclemys terrapin pileata* is common in brackish waters of Alabama and Mississippi. All sea turtles of the western Atlantic Ocean may be expected in Mississippi waters except for the Pacific ridley *Lepidochelys olivacea*, indigenous in northern South America in the Atlantic.

INTRODUCTION

In the past few years considerable interest in sea turtles has developed in the commercial shrimp fishery because of laws of the federal government. Turtles are caught in trawls of shrimp fishermen, and animals pulled for more than 2 hours or so are drowned. As a preliminary to some action, both State of Mississippi and United States authorities have asked the Gulf Coast Research Laboratory (GCRL) for a summary of information on sea turtles. These words are written as a summary of the information known about Mississippi coastal turtles.

CLASSIFICATION

The Order Testudinata of the Class Reptilia of the Subphylum Vertebrata includes all turtles that have lived on Earth. This group of animals arose during the Lower Triassic approximately 185 million years ago.

BRACKISH WATER TURTLES

A few freshwater turtles are washed down into low-salinity waters following freshets, floods, and rain storms on the coast. The writer once picked up a snapping turtle (*Chelydra serpentina*) at the mouth of Biloxi Bay (Gunter et al. 1973). Water salinity was 16.9 ppt.

During the period of August 26 through September 19, 1969, a unit of Seabees assisted in cleaning up the GCRL following Hurricane Camille of August 17-18, 1969. During that process, a very lively alligator snapping turtle (*Macrolemys temmincki*) was dug up from about 2 feet under the bottom of the innermost pond at the head of the boat slip. Salinity of the water was not taken. The pond was about 60 yards from the shore of Davis Bay, a tributary of Biloxi Bay. This turtle was dug up in September, virtually at the end of summer.

A gopher tortoise, *Gopherus polyphemus*, had a den between the buildings and the shore of Davis Bayou and every few days it swam the Laboratory boat slip and proceeded to high ground to the north. I never saw this event, but had it reported to me. I placed this turtle in a large sink of fresh water and found it floated very well. I made this

determination at the written instigation of Chapman Grant, who wondered if gopher tortoises could float.

Christmas and Waller (1973) reported three *Pseudemys floridana*, the Florida Cooter, from water with a salinity of 5.5 and 5.6 ppt from the lower Tchouticabouffa River.

The diamondback terrapin (*Malaclemys terrapin*) is the common turtle of low-salinity waters from Maryland to south Texas, and it has been divided into several subspecies along the way. In Mississippi, the subspecies *pileata* is common in low-salinity waters and in marshes, but seems to have fallen in numbers in recent years in the area of this Laboratory, possibly because of resurgence of the alligator. The same turtle is found in Alabama and, according to Mount (1975), it has declined in Mobile Bay due to Hurricane Camille in 1969.

All of the turtles listed above, except the diamondbacks and the gopher, are essentially freshwater species which only venture into low-salinity water as strays. The diamondback is essentially a brackish-water turtle; the gopher tortoise is terrestrial.

SEA TURTLES

Marine turtles have strong resemblances in that the feet are all flippers made for swimming and not much else. The largest is the leatherback turtle (*Dermochelys coriacea*) with parallel ridges down the back, and a leatherlike carapace undivided into plates. Ingle and Smith (1949) said a specimen from British Columbia weighed 1,450 pounds. It is worldwide in the tropics and subtropics, but not of great abundance anywhere. However, Leary (1957) reported seeing 100 along one rip current over a distance of 30 miles on the Texas coast. The leatherbacks belong to the Family Dermochelidae while all other sea turtles belong to the Family Cheloniidae. Although all species come close to shore and enter the estuaries at times, apparently all of them venture to the high seas and have been seen there far from land. However, they seem to be restrained by cold water. In North America, *Dermochelys coriacea* goes to Newfoundland and British Columbia. Its presence in most oceans led Hvass (1958) to say that it is probably the most widely distributed of all reptiles. De Sola (1939) said that the leatherback is the largest reptile on Earth, and he reported a weight of 1,900 pounds. However, I think that this is less

than the huge alligators this country formerly produced, one of which measured more than 19 feet in length.

Records of nesting of this species on the south Florida coast have been given by Caldwell et al. (1955), Allen and Neill (1957), and Caldwell (1959). Occurrence records and scattered nesting records of this turtle along the northern Gulf coast of Florida have been given by Yerger (1965).

We know of no other nesting records of this turtle elsewhere on the United States Gulf coast, but it is seen occasionally (see Leary 1957), and once I found a large dead one in Copano Bay, Texas, following a hard cold spell (Gunter and Hildebrand 1951).

Although we have no precise record of *D. coriacea* in Mississippi waters, we may assume with fidelity that, like the much rarer manatee, these animals occasionally swim through the waters of the state. Mount (1975) similarly has listed it in the salt waters of Alabama. Viosca (1961) in his listing of Louisiana turtles says of the leatherback, "Rare along our Coast."

The Atlantic loggerhead (*Caretta caretta*) is the largest chelonid. Caldwell et al. (1959) give the nesting range as from Cape Lookout, North Carolina, to the Caribbean Sea and Mexico. It has been tagged off South Carolina, and taken off Pass á la Loure of the Mississippi River. The flesh is not highly esteemed and there is no known fishery for the species today. Groups of five or six of these turtles were seen off the western end of Horn Island in 1976, but we have no record on nesting in Mississippi.

The green turtle (*Chelonia mydas*) is noted for its culinary qualities and there are West Indian records of specimens up to 850 pounds. The animal is primarily herbivorous in contrast to the loggerhead. Several thousand acres of seagrasses in Mississippi Sound must be a special attraction to this species. Seagrass beds of Mississippi have been described by Eleuterius (1977).

According to Marquez-M (1966), the green turtle is called La Tortuga Blanca in Spanish because that is its color; the green refers only to internal fat, or calipash, which colors the soup. The eggs also have a greenish tinge. In some parts of the Pacific, the shells of cognate subspecies are almost black (Hirth 1971).

Until the turn of the century, the so-called green turtle and the ridley were shipped alive from south Texas ports to New York. These hapless animals were flipped onto their backs and carried that way on the open deck of coastwise steamers with the forelegs lashed together to impede struggles to right themselves. We might reasonably surmise that in heavy weather some of these were freed by being washed overboard, but it was not a common loss. The inability of sea turtles to right themselves was taken advantage of in their capture. One old Texas fisherman told me that the turtles came ashore on islands at night and went to sleep, whereupon fishermen crept up quietly and rushed about flipping the turtles on their backs; they returned and picked

up the turtles later. In all likelihood the expression "turned turtle" derives from experiences of such a nature.

There seem to be no similar accounts of sea turtles on the Mississippi coast, but in 1918, over 337 pounds of green turtles were listed as sold (Rebel 1974, p. 116).

A record card in our turtle file is worded as follows:

Atlantic green turtle identified by David Burke, caught at Chandeleur, Louisiana, on 27 October 1972 by Mark Compton, a boatman. Turtle is about five or six years old and had 110 turtle barnacles, *Chelonibia testudinaria*, on his shell. He was caught in three feet of water. Carapace length 263 mm.

On August 21, 1972, Mr. Richard Waller saw a Gulf ridley at longitude 29°26'5"N and latitude 88°56'1"W. This is approximately 80 miles south of Horn Island, Mississippi.

Viosca (1961) said the ridley was the most abundant turtle off the Louisiana coast and that coincides with my observations over some 50 years off the northern Gulf coast. Viosca (1961) said the Gulf ridley preferred to nest in the loose sand of the Chandeleur Islands rather than the compacted beaches west of the delta of the Mississippi River. Apparently it formerly nested on the eastern coast of northern Mexico, and the adults extended to the Bermudas and occasionally to the British Isles. There is a cognate species on the western coast of Mexico and on the Pacific coast, generally.

The ridley is the smallest of the edible sea turtles. It has no known large nesting grounds on the northern Gulf coast. It is a small white turtle growing to about 100 pounds in size. Fishermen often take it home to eat when it is caught.

It has been noted in the case of the leatherback, the green turtle, and the Gulf ridley, that there is a peculiar gap in the distribution of young growing turtles. From the time the young escape to sea until the adults come ashore to lay, the intermediate sizes are not seen. Intermediate sizes are extremely rare and virtually unrecorded. Carr (1967) expounded on this matter at some length. This situation is not unknown in other animals and is particularly puzzling in the case of the tarpon. With regard to turtles, it may well be that the young ones hunt attached beds of sargassum or even the floating sargassum. Here the trouble is that the distribution of attached and floating sargassum is very diffuse and not well known. It could be that one little turtle per square mile would absorb all the annual production from La Tortuguero, the Costa Rican nesting area, without appearing excessively numerous.

The hawksbill (*Eretmochelys imbricata* Linnaeus) has such a glistening, beautiful shell compared to all other turtles that it must be seen to be believed. The flesh is not favored and, in the Far East, it is said to be poisonous at times (De Sola 1939). In the northern Gulf only animals 1½ feet in carapace length or less are seen. In the southern Caribbean specimens 3 feet in carapace length have been reported. Most biologists who spend time afloat have seen a few hawksbills in the northern Gulf. They are reputed

to be active and aggressive. Mr. Richard Waller of this Laboratory once took a foot-long specimen at the surface about 40 miles south of Horn Island, Mississippi, where it was apparently asleep on a floating mat of sargassum. His chief impression was of the terrible fright of the captured animal and its violent attempts to escape. Because of that he let it go in a very short while. The hawksbill is not known to nest on the northern Gulf coast.

SOME GENERALITIES AND MINOR POINTS

Turtles were contemporaries of early dinosaurs and they have long outlived them. Their evolutionary strategy has been highly successful even though there seems to be a temporary recession of sea turtle populations caused by over-exploitation by man. Carr (1967) has suggested that this crisis may be met by a successful cultivation of turtles. The recent increased interest in mariculture gives some hope for this development.

Wetjen (1948) and Carr (1967) have documented the great importance of sea turtles in the tropics of two and three generations ago. Carr (1967) has also told about the decline, but he has outlined a hopeful prognostication regarding management.

A laying place for the green turtle still exists in Costa Rica; one for the Gulf ridley on the northeastern Mexican coast recently died out (see Carr 1967). Nesting of the hawksbill probably has occurred only in the Caribbean region in historic times. There are reported single or scattered nestings of the ridley, leatherback, green turtle, and loggerhead on the Gulf and South Atlantic coasts north to Virginia from time to time, and apparently these scattered nestings now maintain the species. Hopefully they will continue to do so until mankind remarshals its conservation forces and comes to the rescue of these antediluvian monsters which have existed for about a fifth of a billion years.

Back in the first decades of this century, when diamond-back terrapins were selling for as high as \$90 a dozen, S. F. Hildebrand (1929) was successful in raising these animals; commercial ventures also were successful in Louisiana, North Carolina, and Virginia. However, when wine was prohibited, preeminence of turtle soup declined, and sales of turtles and calipash declined as prices fell. Similarly, hawksbills were given some respite by the invention of a synthetic substitute for turtle shell.

Several authors state that marine turtles never come ashore except to lay their eggs and that only the females, of course, come ashore. However, Stebbins (1954) said that various Pacific species come ashore to "bask", and other authors said they come ashore to sun themselves. In this connection we should note from the statement above that turtles along the Texas coast come ashore at night to sleep.

The leatherback is said to be one of the fastest of all swimmers. It has been stated that they can get up to 32 miles

per hour, but I have seen no precise clockings of the swimming speed of this animal. But we may conclude that it is a very fast swimmer when disturbed or startled because it has impressed various observers. In the literature there are also statements that this turtle likes to remain at depths of 150 feet, but I have seen no statements as to how this was determined. With the exception of the ridley, female turtles come ashore after dark at which time they may be scared back to the water by the distant striking of a match, according to Carr (1967). The ridleys, in contrast, will crowd ashore in the daytime, or at least the Gulf subspecies does so.

There is a peculiar anomaly in the distribution of the Pacific ridley. This species is also found in the southern Caribbean in the Guianas, but nowhere else on the eastern shores of the western hemisphere. Carr (1967) discussed this at length and showed that these animals were also found on the West African shore. He assumed that it comes around Africa from the east and is connected with Pacific ridleys all the way around the world to the western shore of Mexico. An alternate theory may be that this population was cut off from the Pacific when Isthmus America was formed approximately 5.7 million years ago (Emiliani et al. 1972). In any case the Gulf species of this turtle is found only in the Atlantic but the Pacific subspecies is found widely in the Pacific and also in the restricted area of Atlantic South America.

In summary, on the eastern shores of the western hemisphere we have *Dermochelys coriacea*, *Eretmochelys imbricata*, *Caretta caretta*, *Chelonia mydas*, *Lepidochelys kempfi*, and *L. olivacea*. The Pacific species generally are given subspecific standing. Sea turtles were very numerous in Colonial days; they were widely used as food. In some cities such as Charleston, South Carolina, their eggs were highly prized for the baking of cakes. All species seem to have declined greatly in the past 100 years, but it is to be hoped that, as the knowledge of their biology increases, effective conservation measures will lead to restoration of their populations.

The most recent review is that of Rebel (1974). It cites most of the literature and gives information on past commercial production in the Gulf and South Atlantic areas.

Just as this manuscript was completed the volume containing the recent study of south Texas sea turtles by Rabalais and Rabalais (1980) was received. It must be mentioned in connection with the present remarks. The hawksbill (*Eretmochelys imbricata*) and the leatherback (*Dermochelys coriacea*) were listed as rare and strandings of these two were not listed, although sightings and previous records were given. Subadult loggerheads (*Caretta caretta*) were listed as the most abundant turtles on the south Texas coast with Kemp's ridleys as the second most abundant. Sporadic nesting of ridleys and green turtles on Padre Island was noted.

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