

# A Louisiana Terrapin Population (*Malaclemys*)

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TURTLES of the genus *Malaclemys* occur in isolated populations along the Louisiana coast. Reports of fishermen indicate that in some localities they are exceptionally abundant and are often taken in nets. The demand for these turtles as food is now limited and they are not usually brought to market. The difficulty of collecting them without special equipment has discouraged their study by herpetologists.

The investigations of Hay, Hildebrand and others have contributed much to our knowledge of the life history of captive specimens but little information is available on natural populations. Too, most of the data reported on captives were derived from a study of a hybrid stock of two or three subspecies; *Malaclemys terrapin terrapin* (Schoepf) and *Malaclemys terrapin centrata* (Latreille), and of these two with *Malaclemys terrapin littoralis* Hay. It is difficult to relate the information so accrued to the existing populations.

Two subspecies are reported to occur on the gulf coast from the Florida panhandle to southern Texas, *Malaclemys terrapin pileata* (Wied) and *Malaclemys terrapin littoralis* Hay. The ranges of neither of these is adequately defined. The two subspecies are reportedly different in these respects (Hay, 1904; Carr, 1946):

<u><i>M. t. pileata</i></u>	<u><i>M. t. littoralis</i></u>
Carapace black or dark brown.	Carapace lighter, brown
Plastron yellow, inclined to be dusky or olive.	Plastron nearly white.
Horny covering of upper jaw usually white but marked with dark color in the male.	Horny covering of upper jaw white in both sexes.
Legs, tail, skin of body nearly black.	Skin green-gray, thickly marked with black spots.
Sides of carapace nearly parallel.	Sides of carapace not nearly parallel.

A sample of 96 turtles from Dulac, Louisiana contains individuals having some of the characteristics of both these subspecies and others having the characteristics of each. The color variation is particularly striking. Some of the

individuals are almost entirely black but others have a light gray carapace and a cream-colored plastron with gray legs and body skin on which numerous, well-defined black dots are evident. Many of the males have the black horny covering of the upper jaw characteristic of *M. t. pileata* but others have the jaw clear of dusky markings. There is no consistent, individual representation of the characteristics of either subspecies.

This population is tentatively considered to be an intermediate one. The characteristics are such, however, as to suggest that future investigations of the gulf coast populations will not justify their separation into two subspecies.

Of the 96 individuals, 70 were retained for study. This sample included 13 females and 57 males. All of the males and two of the females were sexually mature. This sex ratio of 4.4 males to one female is unusual in reptilian samples. The usual reported ratio is two or more females per male. The repeatedly reported preponderance of reptile females (Forbes, 1940) may be attributed to the difficulty of determining sex (Cagle, 1948) or to selective sampling. The large number of males in the present group may reflect the apparent tendency of females to move toward shore during the egg-laying season. Certainly it should not be assumed that this is the actual sex ratio. Hildebrand (1933: 241) stated that of 1,433 terrapins reared in captivity, 200 were identified as males and 1,233 as females when they were old enough to show sexual dimorphism. It is probable, however, that the 1,233 so-called females included many juvenile males that had not yet developed secondary sex characteristics.

The effect on natality of a disproportionate number of males and females in a reptilian population is possibly not so severe as has been demonstrated for bird and mammal populations. The ability of reptilian females to deposit fertile eggs for several seasons after copulation reduces the significance of the seasonal availability of males. It has not been demonstrated that courtship or copulation is essential to ovulation in reptiles.

The two mature females measured 17.6 and 17.7 cm. in plastron length respectively. The latter individual had 10 oocytes larger than 15 mm. in diameter in the right ovary and 8 in the left. The smaller turtle had 9 oocytes larger than 15 mm. in diameter in the right ovary and 5 in the left. No corpora albicans were present in either individual. On the assumption that these oocytes represent the total number of eggs that would be produced the next season, these turtles would deposit 18 and 14 eggs, respectively. Hildebrand (1929: 30) reported that the annual egg production for the wild brood stock of Carolina terrapins (*M. t. terrapin* x *M. t. centrata*) averaged 14.4 eggs per female for a 12-year period. If it may be assumed that the annual reproductive capacity of the captive terrapins is representative of the natural populations of *M. t. terrapin* and *M. t. centrata*, then the gulf coast population may not differ in reproductive capacity.

The 11 juvenile females measured 13.3 to 16.0 cm. in plastron length. The smallest had the maximum oocytes 3 mm. in diameter and the oviducts were not enlarged; the largest had oocytes of 7 mm. in diameter and the oviducts enlarged. Hildebrand (1932: 561) stated that the female Carolina terrapins became sexually mature when they reached the length of 137 mm. but that one was mature at a length of 121 mm. There is indicated a substantial difference in the size at attainment of maturity in females between the gulf and east coast populations.

The males were 9.87 to 12.30 cm. in length; all were sexually mature and sexually active, with the vas deferens swollen with sperm. Hildebrand (1932: 561) observed that males of the Carolina terrapin developed the secondary sex characters at a plastron length of 80-90 mm.

Many of the turtles had distinct growth rings on the plastron. As these growth rings have been demonstrated to be acceptable indications of age and growth in other turtles (Cagle, 1950), it was assumed that the rings would provide a valid basis for age and growth determinations. The maximum length of each growth ring on the abdominal plate was measured with vernier calipers and this used to compute the plastron length at the time the ring was formed. Since the ring bordering the abdominal plate

at hatching was still evident in 12 individuals (10 ♂♂, 2 ♀♀), their early growth history can be determined.

The calculated length of the 12 individuals at hatching was 1.80-3.57 cm.; end of 1st growing season, 3.03-6.11 cm.; end of 2nd, 2.44-8.67 cm.; end of 3rd, 7.54-10.73 cm. Only 10 of the turtles had rings representing the fourth season of growth; these were 9.11 to 11.55 cm. in plastron length. Six individuals with rings representing the fifth season indicated a plastron length of 10.25 to 11.75 cm. and two representing the sixth season a plastron length of 10.99 to 11.50 cm. Males thus may become

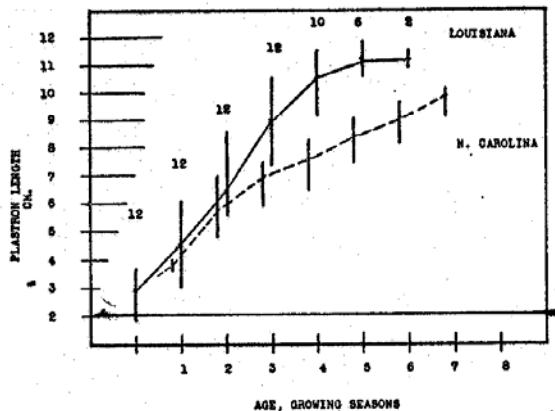


Fig. 1. A comparison of the growth of turtles from Louisiana and North Carolina. The vertical line indicates the range in plastron length and the figure above each line the number of individuals. The dotted line indicates the mean annual growth of 5 captive broods in North Carolina; the vertical lines indicate the range of the mean lengths in each brood.

mature before they complete the 3rd season of growth. Females do not become mature until after the 6th year.

A growth curve for the first six years was plotted from the calculated plastron lengths (Fig. 1). The characteristic rapid rate of growth, with a slowing at the time of attainment of sexual maturity, is evident. The mean annual growth for the first six years of 5 captive broods (1916-2, 1919, 1920, 1922) as reported by Hildebrand (1929, 1932) was plotted against this curve. The rate of growth for the first two seasons is similar but is much slower thereafter for the Carolina terrapin. Although the Louisiana males may attain the size at which they are mature during the 3rd season of growth the Carolina terrapins do not reach this size (p. l. of 8.0-9.0 cm.) until during their 5th season.

Unfortunately, there is no information on the rate of growth of either *M. t. terrapin* or *M. t. centrata* under natural conditions. The differences in rate of growth indicated here may be a difference in captive and wild individuals. If so, it appears that the growth potentiality of these turtles has never been fully exploited and that terrapin culture, particularly of the southern form, may be successful.

The intestinal contents of four individuals includes only the fragments of small clams and snails. Fecal material deposited in the sacks in which the turtles were transported was also composed solely of mollusk fragments.

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