The Northern Diamondback Terrapin *Malaclemys terrapin*
Gems of the Chesapeake
By Marguerite Whilden

Upon close inspection, the Northern Diamondback terrapin is one of the most beautiful creatures in the Chesapeake Bay. It is easy to see how it acquired its name. Some terrapin are a nondescript dark gray or brown, while others are a spectacle in various shades of black, blue and white. Rarely do we see more than a head surfacing to survey a sunning beach or a nesting area. Aside from the famous Terp Testudo, University of Maryland's mascot, many Marylanders may not be familiar with the Diamondback terrapin. Several nature centers such as the Maryland Science Center, National Aquarium, Baltimore Zoo, and our own Sarbanes Oxford Laboratory maintain small ponds of terrapins since they make such excellent kid-friendly, eco-ambassadors. The terrapin's place in Maryland's history, culture and environment goes well beyond mascot status.

The State Reptile

The Northern Diamondback is one of seven subspecies of Diamondbacks found along the Atlantic and Gulf coasts from Massachusetts to Mexico. Living and breeding in salt marshes and tidal tributaries, the Diamondback is the only North American turtle that lives exclusively in brackish water. They prefer unpolluted tidal areas and therefore are good indicators of healthy wetland systems. The Diamondback may live as long as 50 years which is important considering its life cycle and low hatchling survival rate. By seven years old a male is considered mature, can weigh about a pound, and be four inches along the plastron, the underside ridge running front to back. The female terrapin matures later, by twelve years old and can weigh up to seven pounds, reaching lengths of nine inches long. Water temperatures and food supply play a role in growth rates, in warmer waters terrapins stay active, feed longer, and hibernate less. Mating occurs in May. Female terrapins store sperm and thus can produce fertilized eggs up to four years after mating. Light pink and leathery textured eggs, on average 13, are laid in nests during June and July on shore in sand or loam, then covered. Hatching occurs from August through October depending on temperatures. Sex of the hatchling is also determined by the temperature of the nest; a higher nest temperature produces more females and vice versa. Once the eggs are in the nest, the female's obligation is complete. When the hatchlings emerge, they are only an inch long and on their own. Only 1-3% of the eggs that are laid produce a hatchling, the survivorship of hatchlings in the wild is currently unknown but is believed to be equally low. Hatchlings are a favorite with herons. A late hatch may stay buried in the nest and hibernate which most of the adult terrapins do during winter. The terrapin as with all turtles has a strong beak rather than teeth. It is a predator more than a scavenger. The carapace or top shell of the Maryland terrapin may be light brown, bluish gray or black. The plastron is yellow to olive in color. The outside of the top shell is covered with thin, shiny scales called scutes. The scutes on some Malaclemys have black concentric rings which earned this group the nickname "diamondback." The skin of terrapins is its "fingerprint" in that no two animals are alike. Black spots and dashed or curly lines create a unique design. Diamondbacks are strong climbers and have webbed feet enabling them to swim fast. How far they move throughout the Bay is unknown. Studies have shown that adult terrapins may remain in a rather small area for most of their life. Unlike the aggressive snapping turtle, the terrapin can be quite docile.

The Fishery

During colonial times, as with many other Maryland fisheries, the terrapin's habitat was in tact, its natural predators few, and its abundance legendary. Native Americans discovered the savory potential of this reptile and named it terrapin which is believed to be an Algonquin term. Later the terrapin was a plentiful and inexpensive source of protein in tidewater colonies which continued well after the Revolution. Several accounts refer to a 1797 Maryland statute which limited the feeding of terrapin to indentured servants to once a week, down from the previous restriction of three times a week. However, this restriction on the serving of terrapin may be a "colonial myth". A 1975 *Baltimore Sun* article states that the issue had been researched several times by the Maryland Hall of Records and no evidence of such laws could be documented. There are references to "Terrapin" as a grand dish as early as 1800. In 1813 General Winfield Scott refers to terrapin as "the flesh that is honored at feasts of the rich and the brave." The Marquis de Lafayette in 1824 is reported to visit for two main reasons, one being to eat terrapin. During these extravagant times there was a special terrapin plate used for serving, but some terrapin was served in the shell in traditional aboriginal

style. By the turn of the century terrapin was a much desired food item for the famous Terrapin Soup or Stew and the terrapin fishery was well established. The Northern Diamondbacks were known in the food trade as "Chesapeakes" and were by far the preferred variety. The bulk of the market was strictly controlled by only a few buyers. A good size female could bring eight dollars. Demand continued for another twenty years, but the natural supply ran out. About this time it was reported that some "public houses" were serving muskrat and calling it terrapin. Apparently the texture and flavor are vaguely similar. Increased management efforts were either too weak or too late for this slow growing creature. Despite several private farming endeavors and government hatchery attempts interest never rebounded to a point where commercial terrapin farming would be cost effective. Nevertheless, the U.S. government hatchery efforts provided the first and in some cases the only research into the Diamondback terrapin. A few years later a political campaign may have sparked some short-lived interest in a terrapin hatchery. In 1938 a candidate for Governor jokingly promised a "terrapin in every pot". He lost, but the victor is said to have initiated the minor hatchery effort at the Chesapeake Biological Lab at Solomons in 1940. Over the next few years some 4,000 to 5,000 hatchlings were distributed throughout the Bay, but this effort probably had little to do with improving terrapin populations. Nowadays, not many have a taste for terrapin or the stomach for preparing them. Some still think that Prohibition is what really drowned fine dining on terrapin, i.e. why bother without all the proper accompaniments such as wine and sherry. Haussner's, a famous Baltimore restaurant recently dropped terrapin from its extensive menu and only a private club is reported to still serve terrapin stew.

In spite of changes in tastes and habits, a commercial fishery continues in Maryland. Interest in the terrapin as a food item may be gaining as multi-cultural markets are expanding in the U.S. and Canada. Terrapin season is closed from May 1 through July 31 to allow for mating and nesting. The minimum length is six inches along the plastron which may result in a mostly female catch in the commercial fishery. The harvest, market, and commercial value for terrapin is not well understood. (See chart) There are anecdotal reports of several harvesters. A possible explanation is the terrapin catch is incidental and so sporadic that reporting is inconsistent.

MANAGEMENT

The status of the terrapin population in the Bay is obscure, although they can be locally common despite their secretive nature. Much of the more recent terrapin study is concentrated in St. Mary's County along the Patuxent River where populations appear to be stable. Under the direction of Willem Roosenburg several thousand terrapins, their habitat, and offspring have been observed for over ten years. Despite this intense body of research, the distribution and abundance of the terrapin the Chesapeake Bay remains unknown. Small creeks that once supported healthy populations, are now devoid of terrapins due in part to fishing mortality (both directed and unintentional in crab pots) and habitat loss. Terrapins stay close to their natal beaches and waterways and are not likly to repopulate in other areas on their own. Estimates of "hardened shoreline", i.e. bulkhead or revetment, are as high as 75% for some river systems. Occasionally in these waterfront communities, much to the delight of neighborhood children, a terrapin in search of its nesting beach will wind up in the garden or the mulch pile laying eggs. (See photo above)

Natural predators such as foxes, crows, raccoons and humans are increasing near terrapin habitat, while the ideal nesting habitat is diminished by natural erosion, development, and shore erosion protection measures. Some natural grasses planted to slow erosion have actually ruined many terrapin nests by entrapping them in the root system or piercing the eggs. Beach cleaning techniques crush nests. Increasing boat traffic is a threat as the terrapin cannot outswim a speed boat. A huge waste and major threat to the terrapin population is the crab pot fished in shallow waters.

By law, commercial pots are prohibited from the tributaries and must be fished in the deeper waters of the main Bay. Occasionally, a terrapin will find its way into a commercial pot, but if discovered in time many of these terrapins will survive. Since its introduction in the mid 1940s, the crab pot was a commercial gear the use of which was limited to those with a commercial crabbing license. In the 1960s, Maryland waterfront property owners were permitted use of the crab pot at their property only on the weekends and holidays. Currently, waterfront property owners are allowed to fish up to two crab pots off their piers or shoreline regardless of location, main stem bay or shallow tributaries, 24 hours a day, 7 days a week, during the crab season. The "Non-Commercial" or "Homeowner" crab pot is where the curious terrapin is unintentionally captured and drowned. Equally inquisitive muskrats also die in shallow water crab pots. Aside from being wasteful, removal of the by-catch can be difficult. Since a license is not required to fish these pots from private property; there is no information on how many non-commercial crab pots are set or how much crab harvest results. By comparison in New Jersey where a no-cost license is required for non-commercial crab pots, over 10,000 licenses have been issued.

Despite previous efforts to curtail the wasteful capture of terrapin and muskrat by the Non-Commercial crab pot, the proposed measure has been unacceptable to waterfront property owners. This year Maryland's Fisheries Service will introduce regulations which will require the placement of an inexpensive device in the funnel of a crab pot which will greatly reduce terrapin by-catch while not reducing crab catch. The idea is simple: a rectangular template of wire (preferably 11 gauge, standard bracing wire), one and three quarters inches high by four and three quarters inches across, wired into each funnel with hog rings at the narrow end. The flatter and thinner blue crab will continue to have unobstructed access into the crab pot, but the more rounded shell of the terrapin will be excluded. Extensive testing with this size device demonstrated optimum crab catch and minimum terrapin captures. The device was not tested for muskrat exclusion, but may work equally well. Where there is less by-catch there is more room for the target species. A hearing for the by-catch reduction device will be held in February and is anticipated to become effective in April 1999.

Unlike striped bass or blue crab, the terrapin is not a species affected by other states' harvests, migration and spawning patterns, or remote weather conditions. It is a low maintenance, agreeable little critter. Even though we may never develop a taste for terrapin soup, it might be nice to know that the original inspiration for the famous Maryland Terps is alive and thriving throughout the Chesapeake Bay. The management of our terrapin population lies exclusively with Marylanders.