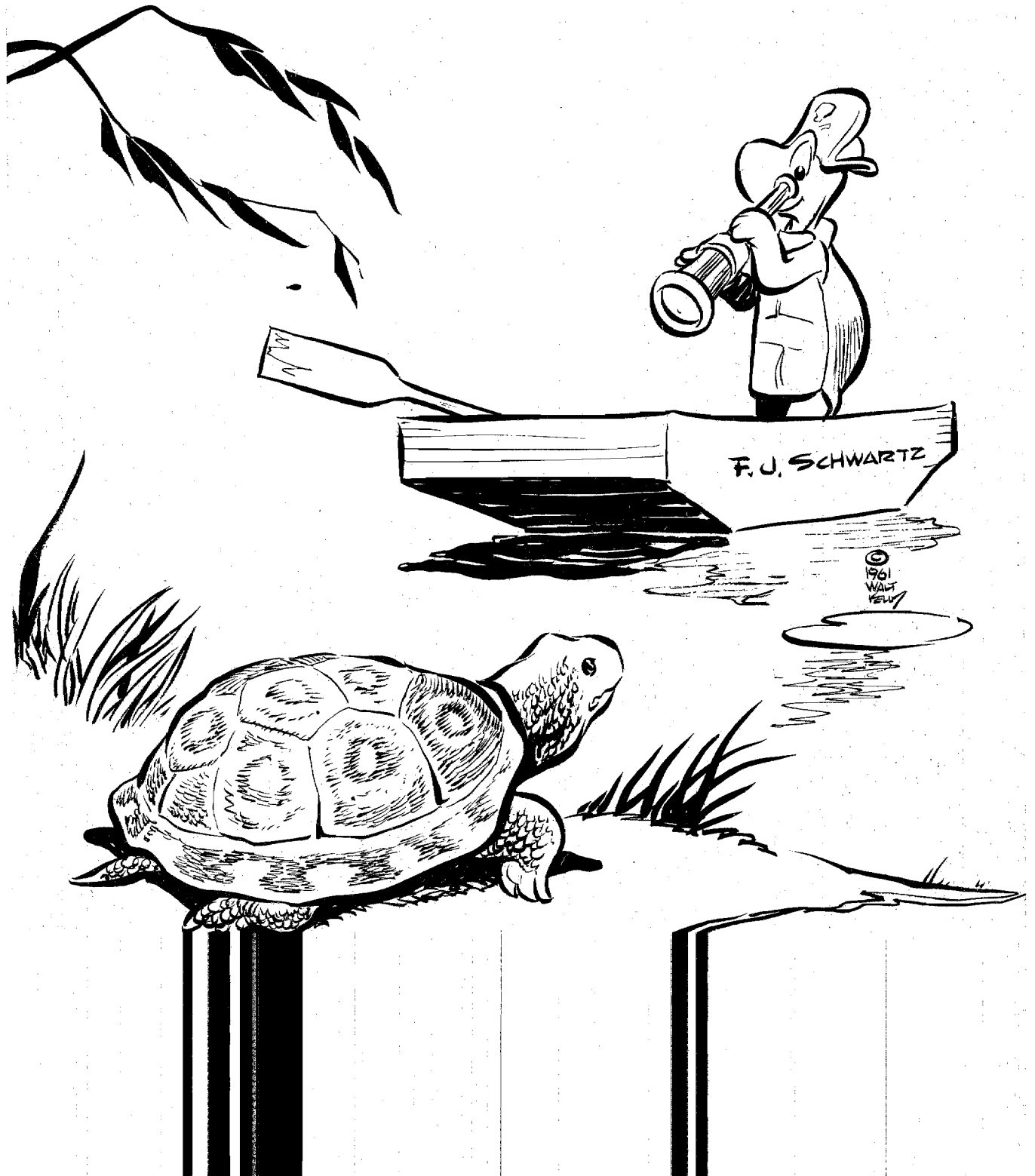


# MARYLAND TURTLES



# *Maryland Turtles*

**FRANK J. SCHWARTZ**

CHESAPEAKE BIOLOGICAL LABORATORY

SOLOMONS, MARYLAND

*Educational Series No. 50*

MARYLAND DEPARTMENT OF RESEARCH AND EDUCATION

SOLOMONS, MARYLAND

**STATE OF MARYLAND**

J. MILLARD TAWES, *Governor*



**DEPARTMENT OF RESEARCH AND EDUCATION**

L. EUGENE CRONIN, *Director*

## TABLE OF CONTENTS

Foreword .....	5
Text .....	7
Turtle Species: Snapping Turtle— <i>Chelydra serpentina</i> .....	12
Stinkpot— <i>Sternotherus odoratus</i> .....	14
Eastern Mud Turtle— <i>Kinosternum s. subrubrum</i> .....	16
Spotted Turtle— <i>Clemmys guttata</i> .....	18
Bog (Muhlenberg's) Turtle— <i>Clemmys muhlenbergi</i> .....	20
Wood Turtle— <i>Clemmys insculpta</i> .....	22
Box Turtle— <i>Terrapene carolina carolina</i> .....	24
Northern Diamondback Terrapin— <i>Malaclemmys terrapin</i> <i>terrapin</i> .....	26
Map Turtle— <i>Graptemys geographica</i> .....	28
Eastern Painted Turtle— <i>Chrysemys picta picta</i> .....	30
Midland Painted Turtle— <i>Chrysemys picta marginata</i> .....	30
Red-Bellied Turtle— <i>Pseudemys rubriventris</i> .....	32
Florida Cooter— <i>Pseudemys floridana floridana</i> .....	34
Green Turtle— <i>Chelonia mydas mydas</i> .....	36
Atlantic Loggerhead Turtle— <i>Caretta caretta caretta</i> .....	37
Leatherback Turtle— <i>Dermochelys coriacea</i> .....	38
Atlantic Ridley Turtle— <i>Lepidochelys kempi</i> .....	39
Hawksbill Turtle— <i>Eretmochelys imbricata</i> .....	39
Key to Turtles naturally found or introduced (*) in Maryland .....	40
Selected Bibliography .....	43

## FOREWORD

Since McCauley's 1945 publication, now out of print, on the "Turtles of Maryland," little has appeared on this interesting component of Maryland's vertebrate fauna. This work is thus an attempt to bring up to date the information that has accumulated during the interval. Each species has been treated in a similar vein regarding name, drawing, distribution, life history and biology. Additional information not usually found in texts or manuals has been added, especially that on folklore, uses and commercial value. Comments on environs, identification, species which should not be considered part of the turtle fauna, and the five known introduced species are included. A key to all the material and introduced species and subspecies is presented for the first time. The distribution maps have been made following the present limits of a species' known range. Dots were not used to illustrate ranges since so many species can and do move about readily. Those species whose ranges are expected to be larger than presently known are so indicated. These species and specimens thereof from the latter areas should be kept and called to the attention of qualified personnel. All levels from the high school to scientist will find material of interest herein.

*The Cover:* Mr. Walt Kelly, originator of the comic strip "Pogo," has contributed his talents to create the cover for this work. His skill and imagination have blended man's ingenious ways of depicting turtles. "Churchy," the turtle of the comic strip "Pogo," stands astonished and fascinated in his flatbottom boat and peers down on a turtle, the species of which remains for you, the reader, to determine from all that is presented in the text. The cover scene can be anywhere in Maryland. The area could be at the edge of an eastern shore swamp, the ocean shore, a lake in the western part of the State, or simply along any one of the many streams in Maryland. Join "Churchy" in learning more about this interesting fauna inhabiting the State.

Extreme thanks are due Mr. George Murphy for his interest and encouragement; Messrs. J. Longwell, B. Ashbaugh, and G. F. Beaven for editorial comments and criticism; the libraries of Enoch Pratt Library for access to old or rare Maryland publications; Mrs. Betty Manning, Librarian of the Chesapeake Biological Laboratory, for assistance with procuring some of the reference material; Mr. William Meredith, Mount Saint Mary's College, for drawing all the turtle species depicted herein; Mrs. Carol Whitesell for drawing the mural and Figures 1-6; and Mrs. Gloria Lankford and Mrs. Margaret Moran for expediting the typing of the manuscript.

*May 1, 1961*

FRANK J. SCHWARTZ

# Turtles of Maryland

FRANK J. SCHWARTZ

Chesapeake Biological Laboratory, Solomons, Maryland

Turtles are familiar to most of us as a liquid—soup. To travelers who streak past in fast cars or boats, turtles appear as small flashes on the pavement or lake. To some of us, especially children, turtles are small shell-protected animals which are sold as souvenirs in dime stores, often painted with the words "Little Orphan Annie." Children swap and trade these pets, thus economy is linked to turtles. To others they are the surprise catches of fishermen or resemble miniature, armed tanks basking on a sunlit log. To a few, a turtle may be the "beast" in the rain barrel awaiting fattening and eventually turtle soup. To the local postmaster, who doesn't find them listed in his book of subject ratings, turtles are completely bewildering and have been, for lack of suitable classification, shipped stamped "dangerous insects."

Turtles are reptiles and like the snakes, lizards, crocodiles and the lizardlike *Sphenodon* of New Zealand, are vertebrates or back-boned animals. Furthermore they are cold-blooded vertebrates, or animals which do not have heat-control abilities and whose body temperatures approximate that of the surrounding air, water or land. To distinguish them as a group, simply saying that turtles are reptiles doesn't solve the problem, as fish, frogs and salamanders are also backboned and cold-blooded. However, if we specify that these animals possess legs and a bony skeleton, fish are easily eliminated. Next contrast the dry, horny outside covering of a turtle with the slimy or scaly one of a fish or the scaleless moist skin of amphibians, frogs and salamanders. Among reptiles: snakes, lizards, crocodiles and *Sphenodon*, turtles alone lack teeth and have shells fused with parts of the backbone and ribs.

Since turtles are a distinct assemblage of

animals and not "insects" as the postmaster noted, what do we know about these animals? What is known of their fossil history, size, distribution, reproduction, ecology, enemies, and relation to man?

Turtles have existed nearly unchanged, except for size, for some 175,000,000 years while other weird animals, plants or objects, such as the dinosaurs, *Archeopteryx*, mastodon, rock formations and types of man have appeared and disappeared from existence (see pages 8 and 9). A fossil turtle from South Dakota, the cretaceous marine *Archelon* of 100,000,000 years ago, was a mere 12 feet long and probably weighed a ton. The gigantic *Golossochelys atlas*, perhaps the largest turtle that existed a million years ago, was a 6-foot shelled animal that stood some 4-5 feet high and roamed the hills of northern India. The largest North American species and probably the largest land tortoise known was *Testudo lochrisekressmanni* from the Pleiocene formation of Florida. The carapace of this species was very high, arched and over 7 feet long. Today, the only living giant land turtles, the Galapagos Island tortoises, weigh a few hundred pounds and have shells 3-4 feet long. The present-day leatherback marine turtle is the largest living turtle, 7 feet long and may weigh nearly a ton.

It is surprising that with such a long geologic history there are relatively few references to turtles in man's writings, ancient paintings or carvings. No reference to the turtle exists in the Bible (the reference to the song of the turtle refers to turtledoves and their spring courtship song and not turtles). Aesop's fables mention the turtle twice. One story concerns the turtle and the eagle while the other deals with the famous race of the hare and the turtle, which the latter wins easily. Turtles are noted

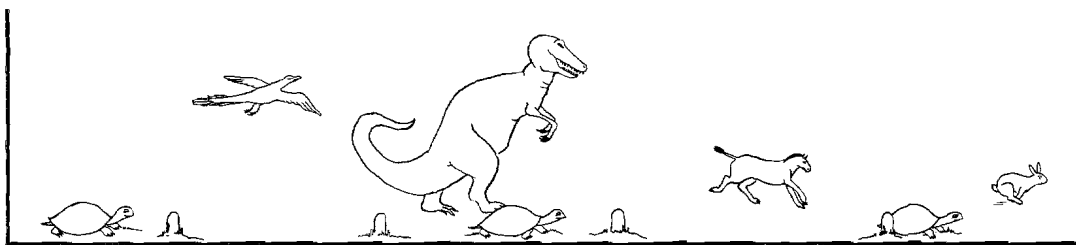
in the "Adventures of Alice in Wonderland." Ancient civilizations of Asia and South America carved their images on buildings, tablets and even worshipped them. The Book of Rites of China names the tortoise as one of the benevolent, spiritual animals and through the centuries it has been honored as an emblem of longevity and the symbol of righteousness. The supreme ruler of China was often determined by reading cracks that appeared when turtle shell bones were scorched. Shakespeare in Romeo and Juliet uses a turtle shell, which hangs in an apothecary shop, to create atmosphere. In other literature, turtles are associated with virtuous women. Likewise, Phidias' statue of Venus stands with one foot on the shell of a tortoise. Some ancient Greeks thought the earth was a plate supported by 4 elephants standing on a big turtle. Indians frequently made rattles of turtle shells to wear or use in ceremonial dances. Turtles also played an important role in Indian mythology. Benvenuto Cellini, during the 16th Century, created a gold cup which depicts an enameled and precious stone covered dragon, supporting a scallop cup, riding a box turtle. In Maryland the turtle once was a term of political import and debate with eventual legislation preventing owners from feeding turtle meat to their slaves more than twice a week. The turtle is perhaps best personified in American literature in "Tales of Uncle Remus" or as "Churchy" in the comic strip Pogo. Last, but not least, the turtle is well known in scientific literature.

The words turtle, tortoise and terrapin are often used interchangeably without regard to name, size, shape or description. A tortoise is

strictly a land form with stump-shaped limbs. Terrapins are fresh or brackish-water species which have a market value while the rest should be called turtles.

Turtles, except for the Arctic and Antarctic, inhabit almost every type of aquatic and terrestrial habitat. More than 240 species of living turtles are currently known to science.

A turtle's shell consists of 2 distinct parts (Figure 1), the upper domed covering of the back is the *carapace* while the flattened lower half covering the abdomen is the *plastron*. These 2 shells are joined at each side by a narrow bridge. The plastron, in some species (see species descriptions), is hinged, permitting complete ventral closure and protection. The ribs during development become fused to the carapace and remain straight, never curving down to meet the lower side of the body as in humans. The trunk or body vertebrae are fused and lost as part of the carapace. In contrast, the bones of the neck and tail remain motile. To alleviate the air breathing problem presented by the rigid shell, turtles have substituted movements of the limb girdles for lack of ribs. To fill the lungs, the bones of the shoulder girdle rotate inward and forward while the pelvis are moved backward and downward. Aquatic turtles have thin-walled sacs in the tail that serve as "Cloacal Gills." Turtles do not have teeth. All female turtles lay fertile shelled eggs. Turtles can close their eyes with the aid of eyelids. A few turtles like the soft shelled and leatherback turtle have leathery shells, rather than hard shells which are divided into scutes. Most turtles can retract their necks into the shell in a dorso-ventral plane. However, one group of "side



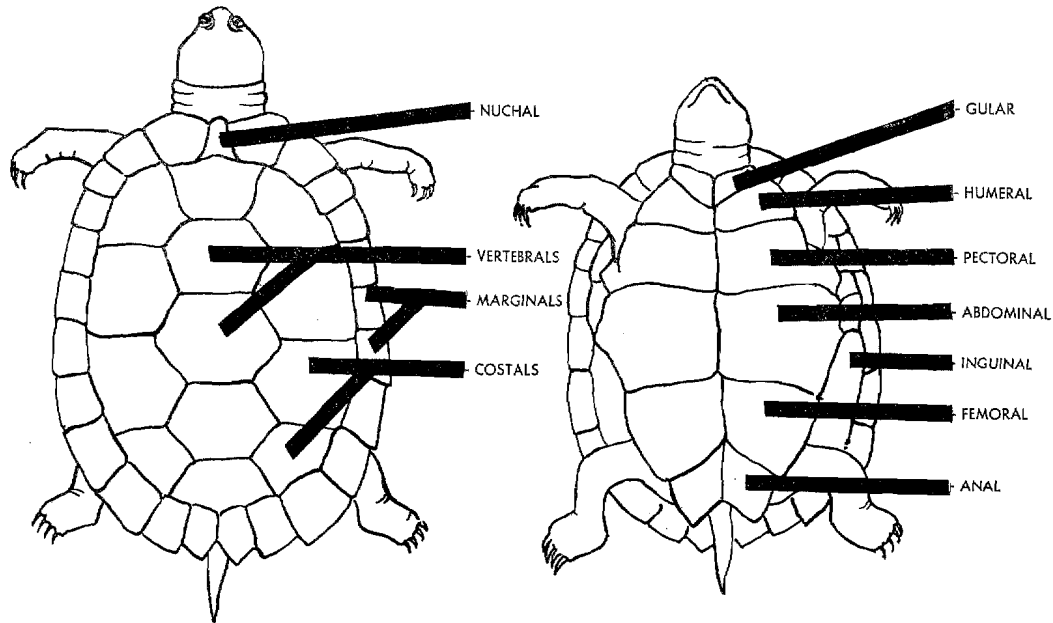


Figure 1: Shields of the Carapace (A) and Plastron (B) of a Typical Turtle.

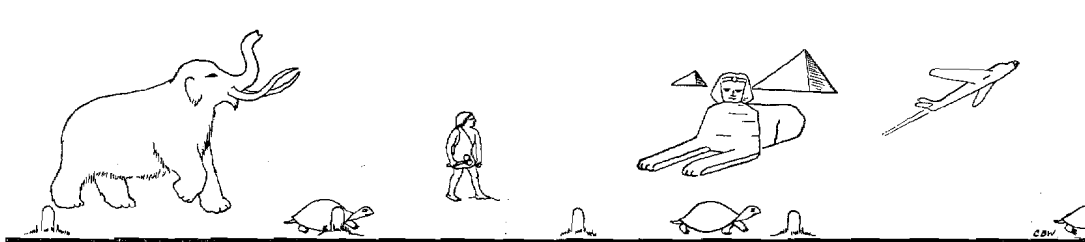
necked turtles” persists today in tropical Africa, South America and Australia which cannot retract their heads into their shells but must fold them sidewise along the carapace.

Turtles no doubt outlive not only every other reptile but even man. Tortoises are known to live 152 years. The common box turtle sometimes lives a century. It is not uncommon for other species to live 50 years.

Male and female turtles may be distinguished in a number of ways. Males usually have longer tails, fore claws and a concave plastron. Among soft shelled turtles, females are usually larger and bulkier.

Courtship is a necessary preliminary to mating. This may span the range from a simple

mounting of the female to more elaborate maneuvers. The painted turtle swims gently toward a female with his forelimbs outstretched to stroke the female’s face by moving his long slender nails up and down. The giant tortoise prefers to approach the female uttering resounding roars, then violently pounds on her body for some period, interspacing this with caressing nipping of the legs and body. Mating usually occurs once a year, during the spring. These matings often serve to fertilize eggs for 2-3 years, as in the case of the diamondback terrapin. Eggs are usually laid in a cup-shaped depression in moist earth or sand. Egg laying may occur anytime both during the daylight hours or at night, as do the huge lumbering marine turtles. The num-





ber of eggs per clutch may range from 2-3 in small land turtles to several hundred in marine turtles.

Turtles play an important role in the balance of nature. They serve as food for man both as eggs and flesh. The eggs are cooked, preserved and candied. Sailing vessels once carried turtles as ballast and as a source of fresh meat for the crew during prolonged voyages. Terrapins, in Maryland, once played an important role in the economy of the state. An industry flourished between 1873-1897 when as much as 89,150 pounds worth \$21,976 was caught, reared in pens or ponds and sold annually. In 1938, 6 or 7 inch diamondback females were worth 1, 2 or 3 dollars, respectively. Gone are the 1917 days of terrapin selling at \$128.00 a dozen for even as late as 1948 the best price amounted to only \$52.00 a dozen. Today the terrapin is increasing again, since man's appetite for them has waned. Presently a terrapin industry still

flourishes in Wicomico County (Nanticoke River), Dorchester County (Little Choptank River), and St. Mary's County (Potomac River). The snapping turtle also plays an important role in the turtle industry's recovery in Maryland, in the following counties and rivers: Anne Arundel County (Magothy River, Whitehall Creek, Severn River, West River, Rhode River and Patuxent River), Kent County (Chester River, Fairlee Creek), Caroline County (Choptank River), Somerset County (Pocomoke River), Wicomico County (Nanticoke River), Calvert County (Patuxent River) and Charles County (Wicomico River). Marine loggerhead turtles are often caught and sold in Virginia markets, however, their rarity in Maryland's portion of Chesapeake Bay accounts for the lack of a fishery for this species. These rivers and 2 species supplied in 1957 and 1958 a total of over 20,000 pounds of terrapin and 284,000 pounds of snapper (Table 1) valued at \$41,778.

Table 1  
WEIGHT AND VALUE OF TERRAPIN AND SNAPPER TURTLES, BY GEAR,  
CAPTURED IN MARYLAND, 1957 AND 1958

Gear	SNAPPER				TERRAPIN			
	1957		1958		1957		1958	
	Weight (lbs.)	Value (\$)	Weight (lbs.)	Value (\$)	Weight (lbs.)	Value (\$)	Weight (lbs.)	Value (\$)
Haul Seines .....	—	—	—	—	—	—	1,900	\$ 798
Hand Line .....	400	58	9,000	900	—	—	—	—
Trot Line .....	2,000	200	—	—	—	—	—	—
Dip Net .....	5,000	600	2,000	240	—	—	700	266
Pots .....	159,000	14,551	98,400	10,866	—	—	—	—
Hooks .....	2,400	288	6,000	606	—	—	—	—
Pound Net .....	—	—	—	—	800	720	1,900	569
Scrapes .....	—	—	—	—	700	700	3,000	1,250
Dredges .....	—	—	—	—	3,800	3,800	1,000	380
Tongs .....	—	—	—	—	4,800	4,230	1,500	756
<b>TOTAL .....</b>	<b>168,800</b>	<b>\$15,697</b>	<b>115,400</b>	<b>\$12,612</b>	<b>10,100</b>	<b>\$9,450</b>	<b>10,000</b>	<b>\$4,019</b>

Turtles are both beneficial and detrimental to man. They act as disposal units in ponds or lakes while feeding on dead fish and other organisms or plants. Harmful features of turtles include destruction of fish, ducks and garden vegetables. Turtles have many enemies during their lifetime, these include fish, sharks, skunks, raccoons, lizards, bears, hogs, crows, frigate birds and man. They are susceptible to external and internal parasites which interfere with their movements. Leeches attach themselves to the soft parts of the shell. Carnivorous insects often lay their eggs on the exposed soft parts of land turtles.

Maryland normally possesses 11 species and 2 subspecies, along with 3 of the possible 5 marine species, of turtles which inhabit land, fresh, brackish or oceanic water habitats as part of its reptile fauna. Five species have been introduced by man into the state to yield a total of 21 species of turtles recorded in Maryland. Many of these species are well known while others are so shy and secretive that almost nothing is known of their biology. Several turtles, especially the marine species, are only occasional visitors to Maryland's waters. A few turtles, like the green turtle, are being so heavily exploited elsewhere that the once proud and vast armadas that roamed the seas have dwindled to only a few thousand. Further comments relative to each species will be found in the section which deals specifically with each species.

Errors in identification have often added the following unnaturally occurring species to Maryland's turtle fauna: Blanding's turtle, *Emys blandingi*, near Pimlico and the midland painted turtle, *Chrysemys p. marginata*, at the Chain Bridge, District of Columbia, have been mistaken for the eastern painted turtle. Troost's turtle, *Pseudemys scripta trousti* and the red-eared turtle, *P. s. elegans*, midwestern forms, have escaped as pets and

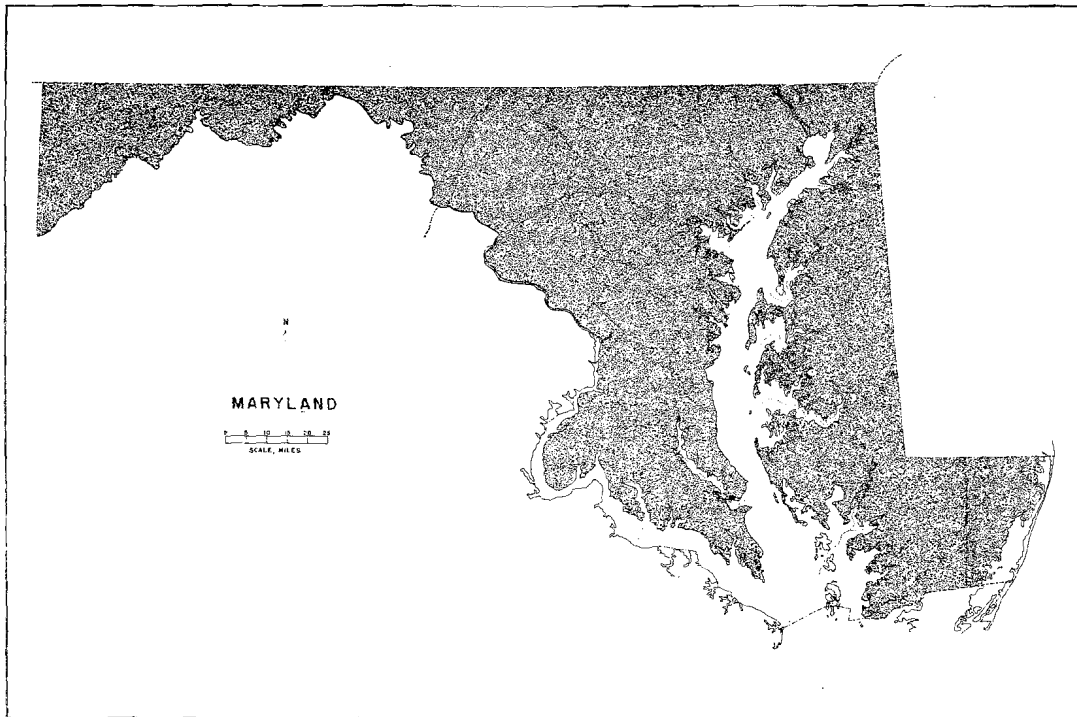
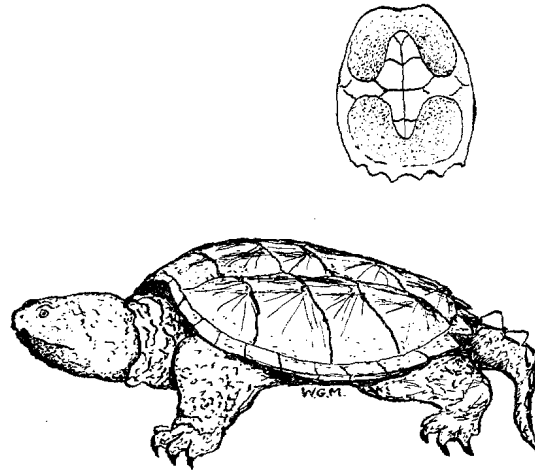
have now been established near Baltimore, Maryland. Likewise a single record of the spiny soft-shelled turtle, *Trionyx ferox spinifera*, exists at the head of Rhode River. It too, perhaps, is another example of a pet escape. Recently a large 8 $\frac{3}{8}$  inch specimen of the Mississippi map turtle, *Graptemys kohni*, was caught in a haul seine in the Patuxent River, Maryland. It, too, is another example of a store bought or introduced pet. All of these species are western or southern species that undoubtedly have been brought into the state as pets.

Although turtles have a complete ear but can't hear, their keen sight, wide color spectrum discrimination and the ability to learn a maze or to distinguish between vertical and horizontal lines, makes it certain that they will continue winning races. Ancient forms have evolved, overrun the earth and have disappeared into fossil history. Many modern forms, such as the green turtle and the bog turtle, are nearing extinction but, as in the panel on pages 2 and 3, turtles seem to be plodding along at 0.6 miles per hour unchanged, unconcerned on into time.

The identification of turtles depends primarily on the configuration of the head and shell, the arrangements of the plastral and carapical shields and the color pattern of the head and legs. The identifier must know the names of the shields (Fig. 1A and B). The size of the turtle is expressed as the maximum length of the carapace measured in a straight line.

To use the key on pages 40-42, simply start at the first pair of choices and after you decide which best fits your specimen follow that to the end of the line to either learn the turtle's name or to what couplet you should next proceed. If the latter occurs, proceed and eventually you should arrive at the identity of the turtle you are examining.

SNAPPING TURTLE—*Chelydra serpentina*

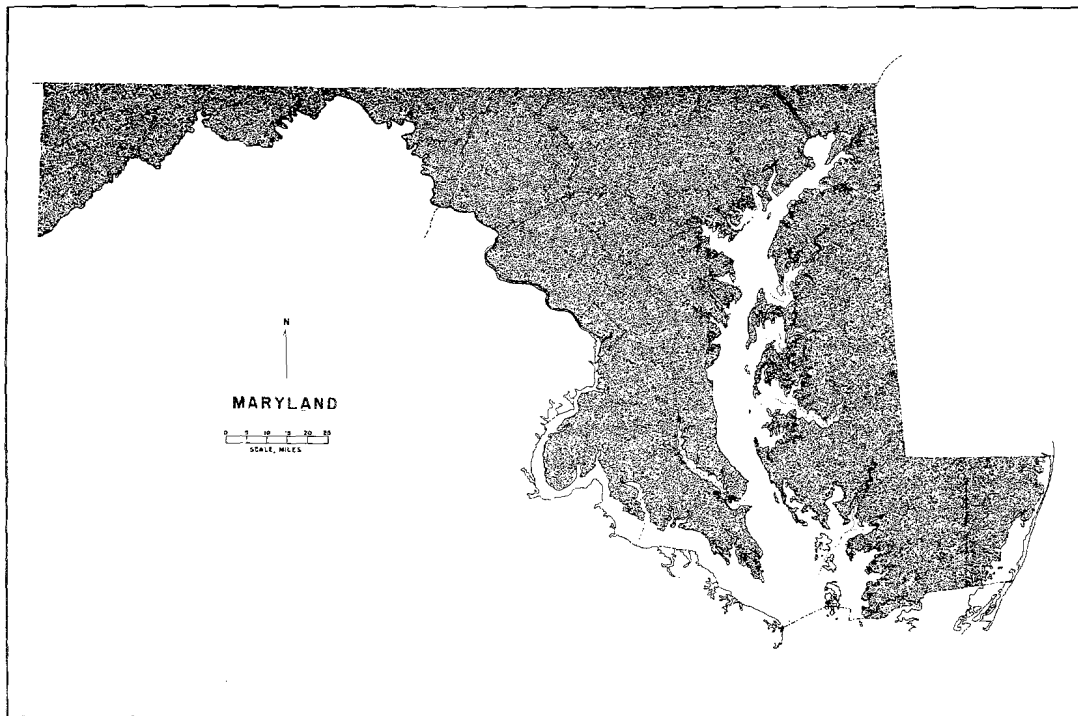
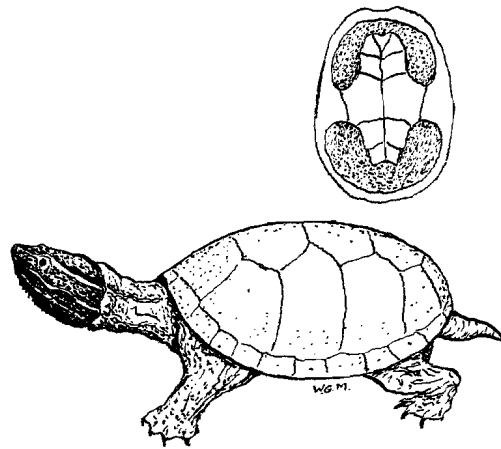


Maryland distribution of the Snapping Turtle *Chelydra serpentina*.

## SNAPPING TURTLE—*Chelydra serpentina*

<b>General Description:</b>	Three-keeled shell, long tuberculate tail, small cross-shaped plastron and dorsolaterally placed eyes, dark grey-black colored.
<b>Size:</b>	Up to 18½ inches long, average carapace one foot, plastron 8 inches. Reach weight of 86 pounds, usually 35 pounds.
<b>Longevity:</b>	20 years, probably ¼ century.
<b>Fossils:</b>	From Pleistocene (10,000 years ago) of Maryland, Oxford Neck, Talbot County.
<b>Sexual Dimorphism:</b>	Female may attain larger size normally without notable differences in form.
<b>Habitat:</b>	Nearly any aquatic situation. Perhaps partial to lakes and ponds with muddy bottoms and submerged trees in association with vegetation.
<b>Breeding Season:</b>	April to November, often in 2 or more clutches.
<b>Eggs:</b>	Spherical, tough, slightly over one inch. Up to 80, known to lay 52 eggs at 2 per minute in dry earth or sand within reach of water. Hatch in 81 days or may delay until following spring.
<b>Breeding Behavior:</b>	Dorsal mounting with legs tightly grasping female, occasionally nipping each others forelegs.
<b>Habits:</b>	Very aggressive when cornered out of water, seldom so in water.
<b>Hibernation:</b>	Buries in mud or in bank muskrat holes to spend winter. Emerge in March.
<b>Migration:</b>	Seem capable of long extended journeys.
<b>Food and Feedings:</b>	Almost entirely carnivorous on crayfish, snails, fish, young waterfowl. Excellent scavenger.
<b>Enemies:</b>	Man chief enemy. Young eaten by crows, hawks, various mammals and large fish. Eggs dug up by skunks, raccoons. External and internal leeches.
<b>Captivity:</b>	Hardy in captivity eating all sorts of foods.
<b>Economic Value:</b>	(See text). Source of food and scavenger. Eggs eaten fried.

**STINKPOT**—*Sternotherus odoratus*.

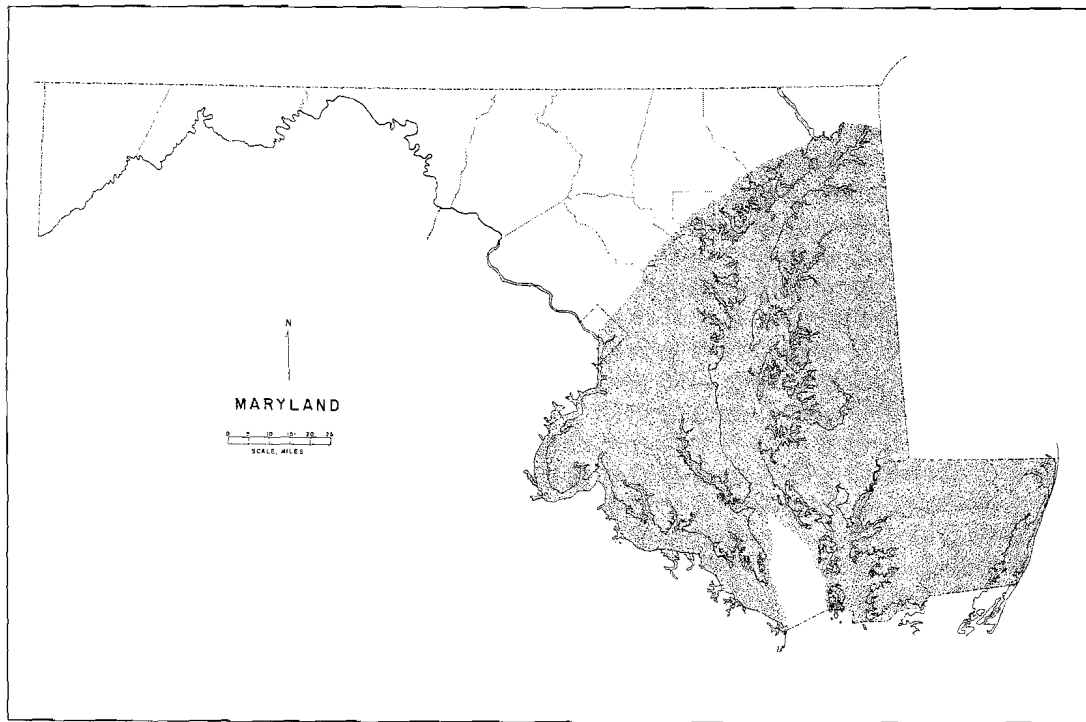
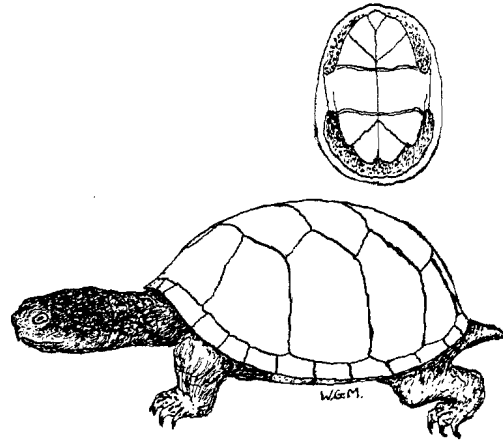


Maryland distribution of the Stinkpot *Sternotherus odoratus*.

**STINKPOT—*Sternotherus odoratus*.**

<b>General Description:</b>	Carapace somewhat arched, may be spotted or streaked, with or without keel. Two yellow stripes along side of head. Plastron hinged forward only. Barbels on chin and throat.
<b>Size:</b>	Carapace about $5\frac{3}{8}$ inches, plastron 3 inches, weight about 8 ounces.
<b>Longevity:</b>	At least 20 years.
<b>Fossils:</b>	?
<b>Sexual Dimorphism:</b>	Male tail longer and ends in blunt nail; female acutely pointed terminal nail, also tuberculated down middle of upper side. Broad areas of skin between plastron scutes. Female with 2 patches horny scales on inner side of each hind leg and wider head than male when about 4 years old. Small areas of skin between plastron scutes. Males sexually mature at 3-4 years; female at 9-11 years.
<b>Habitat:</b>	Shows little habitat preference, being found in streams, lakes and ditches alike.
	<b>Breeding Season:</b>
	Mates active during spring. Sperm life and retention long.
<b>Eggs:</b>	2-7 elliptical white, thick, brittle shell $1\frac{1}{8} \times \frac{5}{8}$ inches laid. June to September between early morning and twilight. Site may be above ground near water in or on bare ground. Gregarious, often with many nests together. Hatch 60-75 days.
<b>Breeding Behavior:</b>	Male chases female and mounts.
<b>Habits:</b>	Aquatic, bottom-loving species. Weak swimmer and clumsy on land. Occasionally wanders onto land, avoids brackish water. Hisses, holds mouth open when captured, will bite.
<b>Hibernation:</b>	Often hibernates gregariously in mud bottoms.
<b>Migration:</b>	Often some distance from water, especially during spring.
<b>Food and Feeding:</b>	Chiefly carnivorous, sometimes eats water plants. Possesses scavenger tendencies. Hunts food on bottom.
<b>Enemies:</b>	Muskrats, crows. Eggs eaten by skunks, raccoons, herons and probably other animals. Parasitized by leeches.
<b>Captivity:</b>	Highly odoriferous, secretive, aggressive natured. Hardy if kept. Easily fed.
<b>Economic Value:</b>	Flesh useless. Annoying to fishermen. No real value.

EASTERN MUD TURTLE—*Kinosternum s. subrubrum*



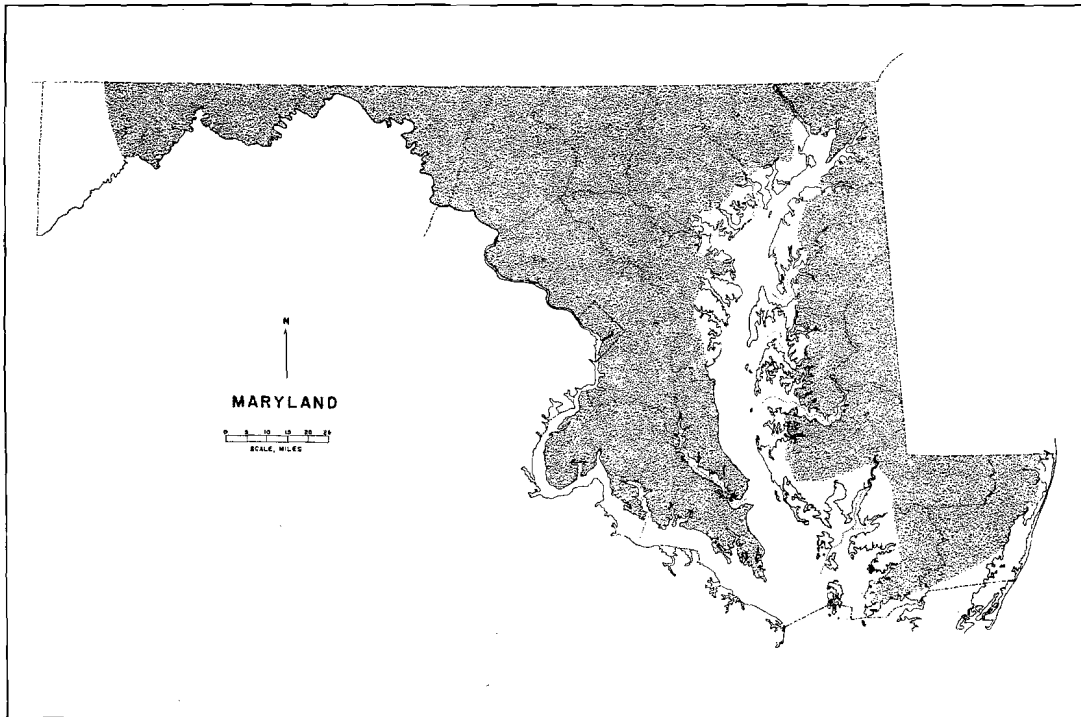
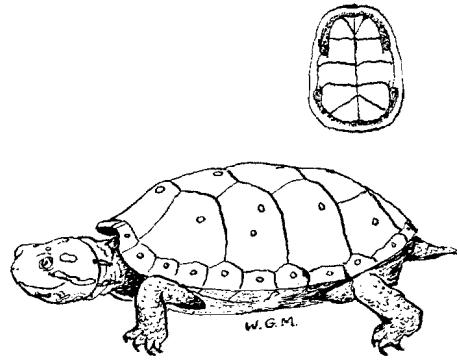
Maryland distribution of the Eastern Mud Turtle *Kinosternum subrubrum subrubrum*.

**EASTERN MUD TURTLE**—*Kinosternum s. subrubrum*

<b>General Description:</b>	Carapace smooth, domed, keelless, without light stripes, side of head plain or mottled with yellow, but not striped. Plastron with two hinges. Stiff bridge.
<b>Size:</b>	Carapace little over 4 inches, plastron 3 inches.
<b>Longevity:</b>	Up to 38 years.
<b>Fossils:</b>	Known in Pliocene formations.
<b>Sexual Dimorphism:</b>	Male tail longer and ends in blunt nail; female slender, pointed one. Male with 2 patches of horny scales on inner side of hind legs. Rear plastron notched in male.
<b>Habitat:</b>	Most frequently seen in quiet water with abundant vegetation and mud bottom. Often in brackish marshes.
<b>Breeding Season:</b>	May—June.
<b>Eggs:</b>	2-5 elliptical white, hard, thick and brittle, $1\frac{1}{4}$ x $\frac{5}{8}$ inches laid in earthen nest 5 inches deep or winter in nest. Hatch in September or October.
<b>Breeding Behavior:</b>	Little known except mate under water.
<b>Habits:</b>	Less aquatic than musk turtle. Bottom inhabitant. Good swimmer. Probably less odoriferous and more passive than musk turtle.
<b>Hibernation:</b>	Little known except some have been found in hole a few feet from water.
<b>Food and Feeding:</b>	Fish, insects, worms, but really not well studied.
<b>Enemies:</b>	Snakes, mammals, crows.
<b>Captivity:</b>	Secretive, prefers to feed in water, but can be kept in aquaria.
<b>Economic Value:</b>	None.



**SPOTTED TURTLE**—*Clemmys guttata*

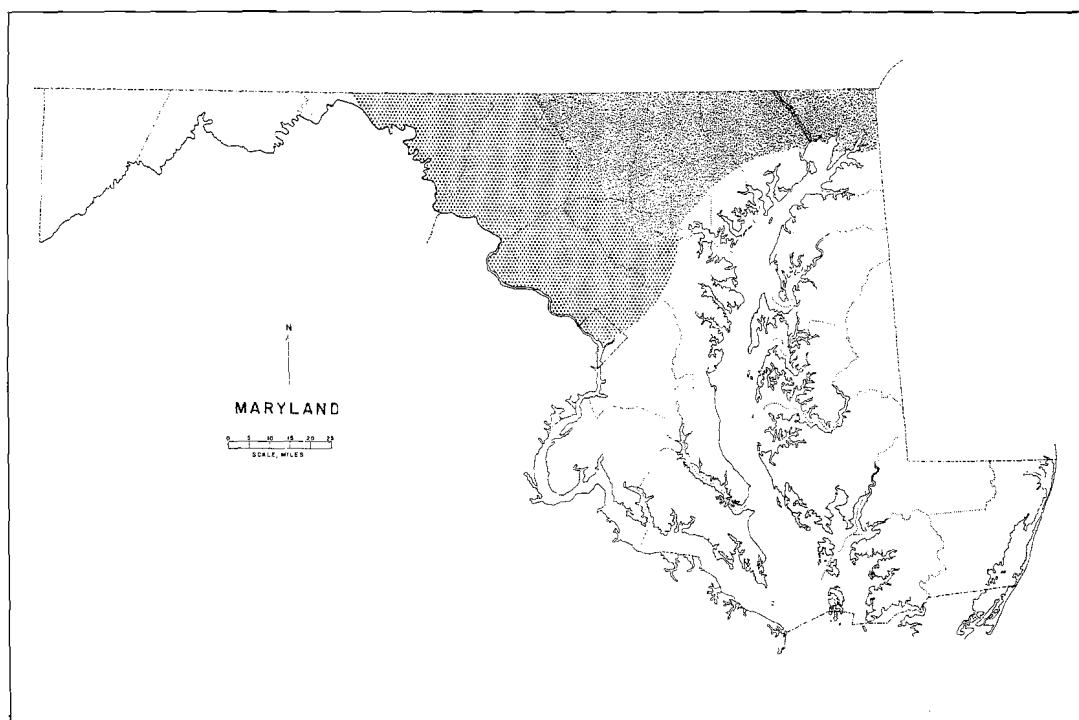
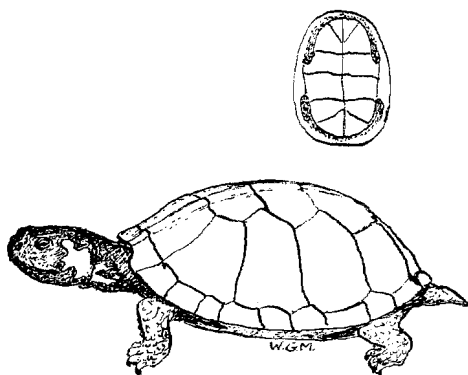


Maryland distribution of the Spotted Turtle *Clemmys guttata*.

## SPOTTED TURTLE—*Clemmys guttata*

<b>General Description:</b>	Carapace smooth, black with numerous small round yellow or orange spots, plastron with large black blotches. With age spots develop on legs and tail.
<b>Size:</b>	Seldom more than 5 inches, carapace usually 4½ inches, plastron 3¾ inches. Weight—few ounces.
<b>Longevity:</b>	Up to 42 years in captivity.
<b>Fossils:</b>	From Eocene formations.
<b>Sexual Dimorphism:</b>	Male eye dark brown, yellow stripe along lower jaw lacking. Throat speckled with orange or yellow. Female eye bright orange, both jaws pale yellow, lower jaw yellow stripe conspicuous. Throat spotted with yellow.
<b>Habitat:</b>	Desires quiet or sluggish water with mud bottoms and low vegetation. Sometimes in mountain streams, canals or lakes. Often in brackish water.
<b>Breeding Season:</b>	April to May.
<b>Eggs:</b>	2-4 elliptical white eggs. 1¼ x 5⁄8 inches in flask-shaped hole near water. Hatch in 82 days.
<b>Breeding Behavior:</b>	Mate and court in or out of water. Little else known. Nest made in afternoon or evening.
<b>Habits:</b>	Extremely wary, likes to bask. None aggressive. Readily buries in mud bottom if startled.
<b>Hibernation:</b>	Little known but apparently between November and March.
<b>Food and Feedings:</b>	Chiefly insectivorous, some plant life and vertebrates such as frogs, salamanders and tadpoles.
<b>Enemies:</b>	Little known.
<b>Captivity:</b>	Excellent pet; no aggressiveness.
<b>Economic Value:</b>	Apparently aesthetic, as too small to be eaten, makes attractive pet.

BOG (MUHLENBERG'S) TURTLE—*Clemmys muhlenbergi*

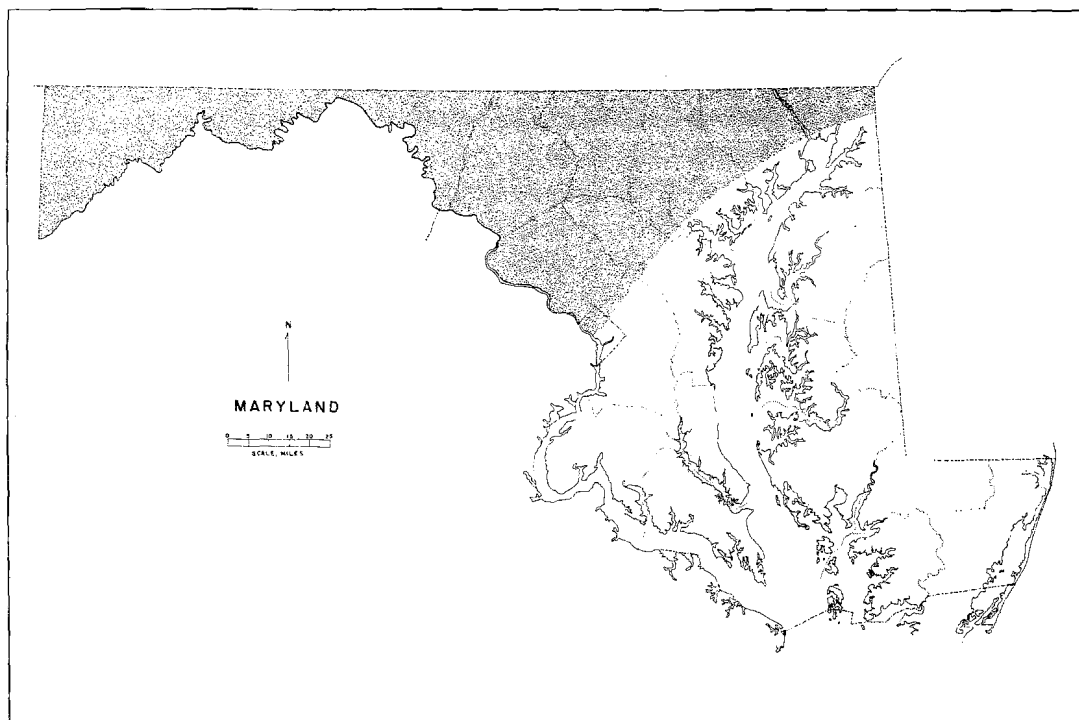
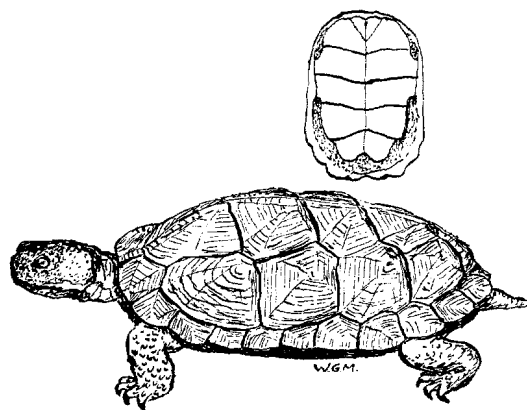


Maryland distribution of the Bog Turtle *Clemmys muhlenbergi* (Shaded, known distributions; dots, additional expected distribution).

**BOG (MUHLENBERG'S) TURTLE—*Clemmys muhlenbergi***

<b>General Description:</b>	Conspicuous orange blotch often yellowish and split on side of head. Shell feebly keeled, dark brown to black. Scales show concentric markings on carapace. Plastron black, irregularly marked with yellow or red.
<b>Size:</b>	Up to 4 inches, carapace usually $3\frac{1}{2}$ inches, plastron $2\frac{3}{8}$ inches, weight less than $\frac{1}{2}$ pound.
<b>Longevity:</b>	Unknown.
<b>Fossils:</b>	Eocene formations.
<b>Sexual Dimorphism:</b>	Male tail thicker and longer than female. Male plastron concave, female flat. Heavy fore-limb claws. Male may have some claws turned outward, females are all straight.
<b>Habitat:</b>	Sphagnum bogs, small streams and wet marshes, or on dry land.
<b>Breeding Season:</b>	Almost nothing known—except eggs are laid in June.
<b>Eggs:</b>	Elliptical $1\frac{1}{4}$ x $\frac{5}{8}$ inches.
<b>Breeding Behavior:</b>	Unknown.
<b>Habits:</b>	Aquatic; equally at home on land. Otherwise, little known. Found up to altitudes of over 4,000 feet often with spotted turtle.
<b>Hibernation:</b>	Little known.
<b>Food and Feedings:</b>	Believed to be omnivorous.
<b>Enemies:</b>	Unknown.
<b>Captivity:</b>	Does well and will eat raw meat, earthworms, beetles and berries in captivity. Will feed in or out of water.
<b>Economic Value:</b>	The rarity of this species does not lend itself well to be considered as food or for other uses.

WOOD TURTLE—*Clemmys insculpta*

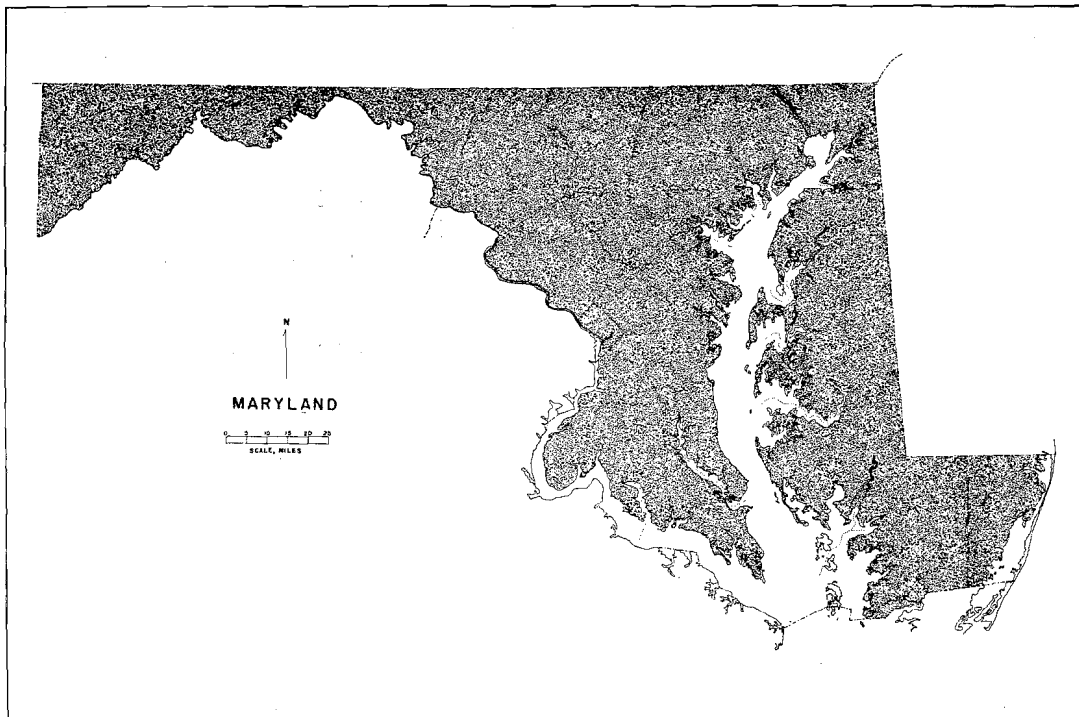
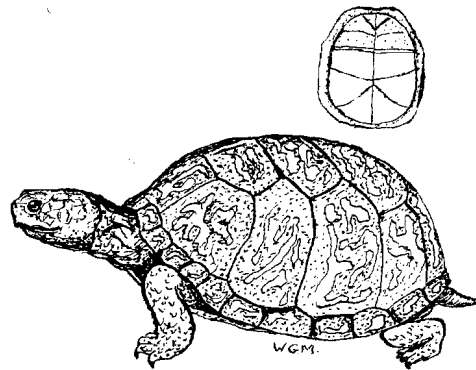


Maryland distribution of the Wood Turtle *Clemmys insculpta*.

## WOOD TURTLE—*Clemmys insculpta*

<b>General Description:</b>	Body soft parts orange-red. Carapace dark sculptured and keeled. Plastron yellow. Upper jaw usually notched. Legs reddish or salmon colored.
<b>Size:</b>	May measure 9 inches. Carapace usually $6\frac{3}{4}$ , plastron $6\frac{5}{8}$ inches, weight to near a pound.
<b>Longevity:</b>	Live at least 5 years.
<b>Fossils:</b>	Pleistocene of Pennsylvania.
<b>Sexual Dimorphism:</b>	Male concave, female convex plastron. Male with long claws and prominent scales on fore surfaces of legs. Male tail length in front of anus twice that of female.
<b>Habitat:</b>	Both aquatic and terrestrial, usually where some moisture exists.
<b>Breeding Season:</b>	May to October.
<b>Eggs:</b>	7-12 elliptical white $1\frac{1}{2}$ x $1\frac{1}{8}$ inches. Buried in sand in June in afternoon. Hatch September to October.
<b>Breeding Behavior:</b>	Courtship begins with elaborate dance and whistling by both sexes and ends with mating under water. Male legs firmly grasp female carapace.
<b>Habits:</b>	Active on land and in water, excellent swimmer. Not aggressive, but will bite. Harmless. Highly intelligent.
<b>Hibernation:</b>	Early October to March in deserted muskrat holes along streams or in mud bottom streams.
<b>Food and Feedings:</b>	Omnivorous, with strong preference to vegetables, fruits, berries and mushrooms.
<b>Enemies:</b>	Skunk, fish.
<b>Captivity:</b>	Excellent pet, often shy. Mate in captivity.
<b>Economic Value:</b>	Sometimes eaten. Once had commercial value, none today.

BOX TURTLE—*Terrapene carolina carolina*



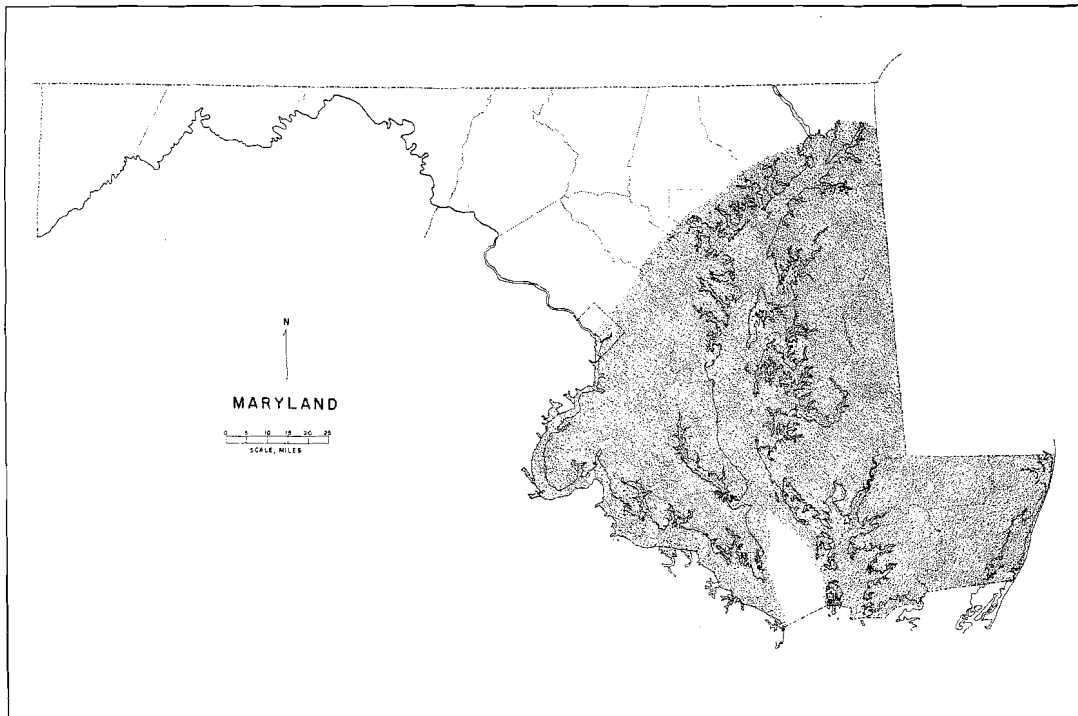
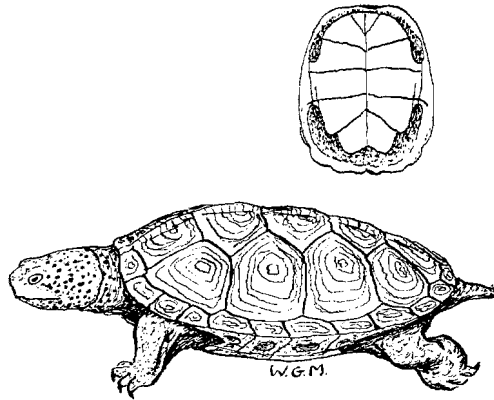
Maryland distribution of the Eastern Box Turtle *Terrapene carolina carolina*.

**BOX TURTLE—*Terrapene carolina carolina***

<b>General Description:</b>	Medium sized land turtle with dark brown, domed and slightly keeled shell usually marked with yellow or orange dots, lines or blotches. Plastron yellow with black blotches and hinged fore and rear to permit complete ventral closure.
<b>Size:</b>	Up to 6 inches, generally $5\frac{3}{8}$ inch carapace, plastron $5\frac{1}{4}$ inches, weight $\frac{1}{2}$ to $\frac{3}{4}$ pound.
<b>Longevity:</b>	Often a century or more. Usually 30-40 years.
<b>Fossils:</b>	Pleistocene of Indiana and Pennsylvania.
<b>Sexual Dimorphism:</b>	Male plastron concave, female flat. Male eye bright red, female dark red, brown or grey. Males usually larger. Male hind claws shorter than female.
<b>Habitat:</b>	Woodland species where some moisture exists. Will swim if necessary.
<b>Breeding Season:</b>	May to October.
<b>Eggs:</b>	8 elliptical, thin, flexible, white $1\frac{5}{16} \times \frac{3}{4}$ inches. Laid June—July or late autumn in earth nest. Can lay eggs without remating from stored sperm. Hatch spring to November.
<b>Breeding Behavior:</b>	Male chases female viciously biting shell and legs. Mounts and with rear legs entwined and at nearly $90^\circ$ angle copulation takes place.
<b>Habits:</b>	Diurnal and solitary. Slow and deliberate moving. During entire life time may only cover area of a few hundred feet.
<b>Hibernation:</b>	In loose soil or burrows. October to February. Estivate in mud during summer hot dry spells.
<b>Food and Feedings:</b>	Ranges from insect larva, snails, worms and slugs to fungus, berries and fruit. Often poisonous mushrooms.
<b>Enemies:</b>	Man, large birds, rats, crows; skunks and dogs dig out and destroy eggs. Parasitized by North American chigger and bot fly.
<b>Captivity:</b>	Excellent pets. Docile.
<b>Economic Value:</b>	No food value, serves as insect control, often harmful to garden crops.



NORTHERN DIAMONDBACK TERRAPIN—*Malaclemmys terrapin terrapin*

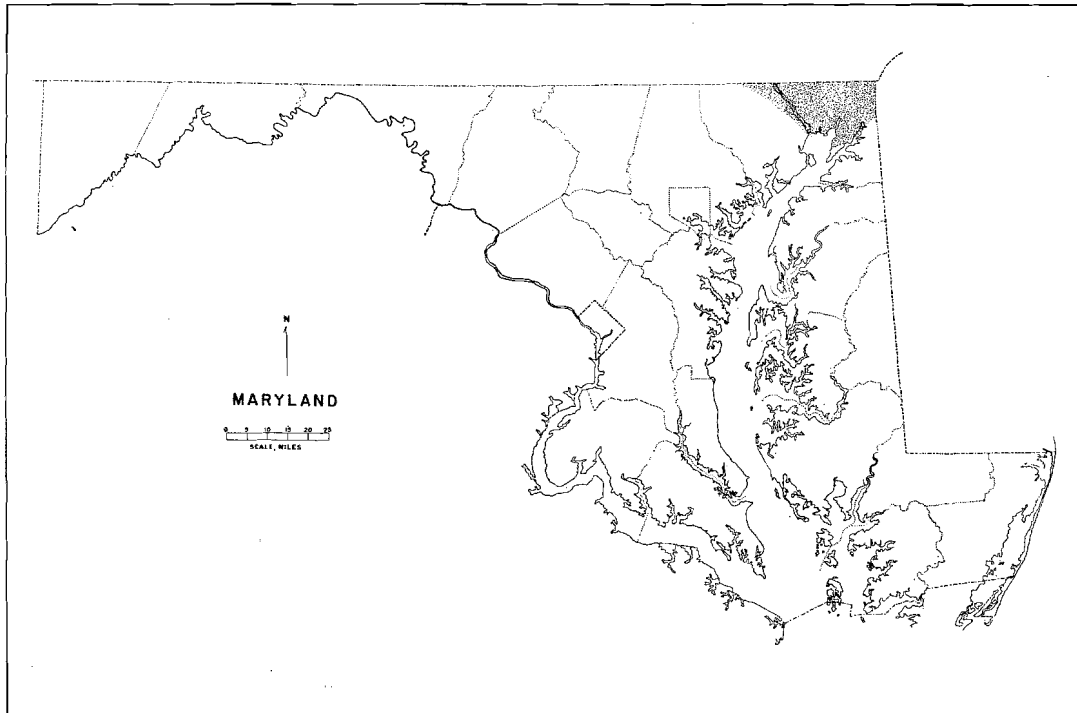
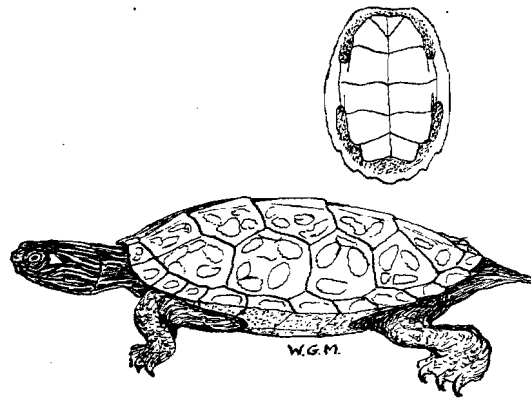


Maryland distribution of the Northern Diamondback Terrapin  
*Malaclemmys terrapin terrapin*.

**NORTHERN DIAMONDBACK TERRAPIN—*Malaclemmys terrapin terrapin***

<b>General Description:</b>	Conspicuously raised concentric ridges on each side of a parallel shell. Head and neck without yellow stripes but black spots on grey. Body ground light grey on brown color. Plastron range of yellow to green-grey. Some black mottling on head and legs.
<b>Size:</b>	May reach 9 inches. Female carapace usually 7-8 inches, male 5 inches. A pound or more in weight.
<b>Longevity:</b>	Perhaps over 40 years.
<b>Fossils:</b>	Era uncertain.
<b>Sexual Dimorphism:</b>	Female larger, head more rounded, deeper shell and shorter tail than male.
<b>Habitat:</b>	Salt and brackish marshes and rivers.
<b>Breeding Season:</b>	May to August, but one copulation may suffice for 2 or 3 years.
<b>Eggs:</b>	5-29 white 1-2/5 x 4/5 inches laid near water. Hatch in 90 days.
<b>Breeding Behavior:</b>	Generally unknown except female lays 4-6 eggs in nests only a few inches apart.
<b>Habits:</b>	Aquatic. Like to bask.
<b>Hibernation:</b>	In mud bottoms of streams and ponds.
<b>Food and Feedings:</b>	Eats crustaceans and mollusks in or out of water.
<b>Enemies:</b>	Muskrats, crows, skunks, raccoons, man.
<b>Captivity:</b>	Hardy, however, young are well adept escape artists.
<b>Economic Value:</b>	(See text). Most highly favored of turtles for food. Supports thriving industries in numerous areas and states.

MAP TURTLE—*Graptemys geographica*



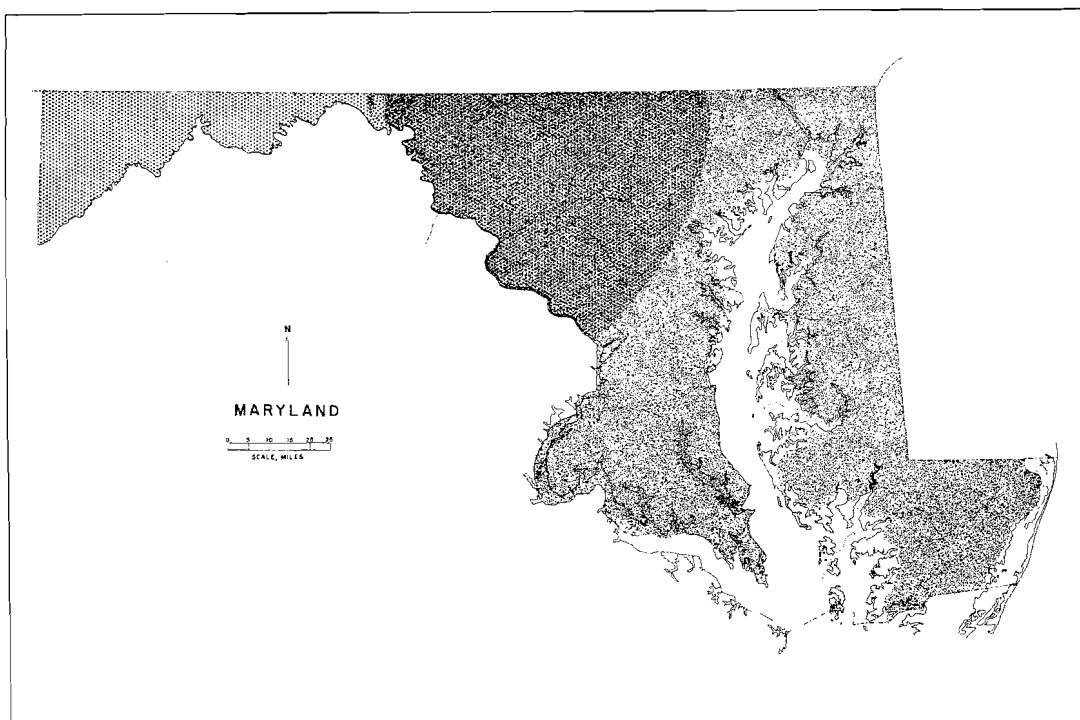
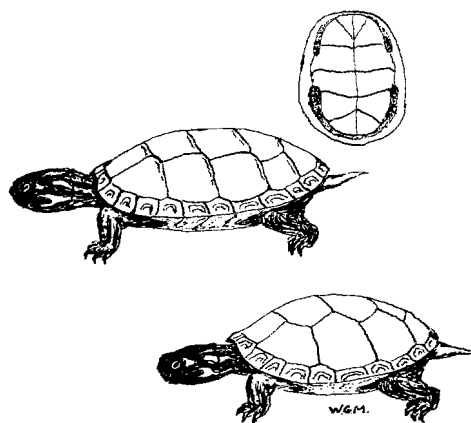
Maryland distribution of the Map Turtle *Gratemys geographica*.

**MAP TURTLE—***Graptemys geographica*

<b>General Description:</b>	Carapace slightly keeled with flared serrate posterior edge. Olive with network of light lines. Plastron yellowish to white and generally unmarked. Head has elongated spot on side not attached to other markings. Distinct vertical line between spot and eye. Neck with numerous longitudinal yellow stripes.
<b>Size:</b>	To 11 inches. Generally 8 inch carapace, plastron 7 inches on larger female. Weight $\frac{1}{2}$ pound or so.
<b>Longevity:</b>	Unknown.
<b>Fossils:</b>	Oligocene.
<b>Sexual Dimorphism:</b>	Male tail longer, female carapace rounded posteriorly.
<b>Habitat:</b>	Back waters, sloughs of rivers and lakes to ponds. Almost strictly aquatic.
<b>Breeding Season:</b>	May to July.
<b>Eggs:</b>	10-16 elliptical, soft, white shelled $1\frac{3}{8}$ x $\frac{7}{8}$ inches. Hatch by September. Laid in early morning near water in earth.
<b>Breeding Behavior:</b>	Little known.
<b>Habits:</b>	Gregarious; likes to bask.
<b>Hibernation:</b>	May not hibernate during winter; if they do, utilize mud bottom or muskrat holes. Emerge by April.
<b>Food and Feeding:</b>	Main food freshwater molluscs, but also eat crayfish, aquatic insects, fish carrion.
<b>Enemies:</b>	Man, mammals and leeches.
<b>Captivity:</b>	Shy. May not feed and may try endlessly to escape.
<b>Economic Value:</b>	Important fish predator. Edible but not generally marketed.

**EASTERN PAINTED TURTLE**—*Chrysemys picta picta*

**MIDLAND PAINTED TURTLE**—*Chrysemys picta marginata*

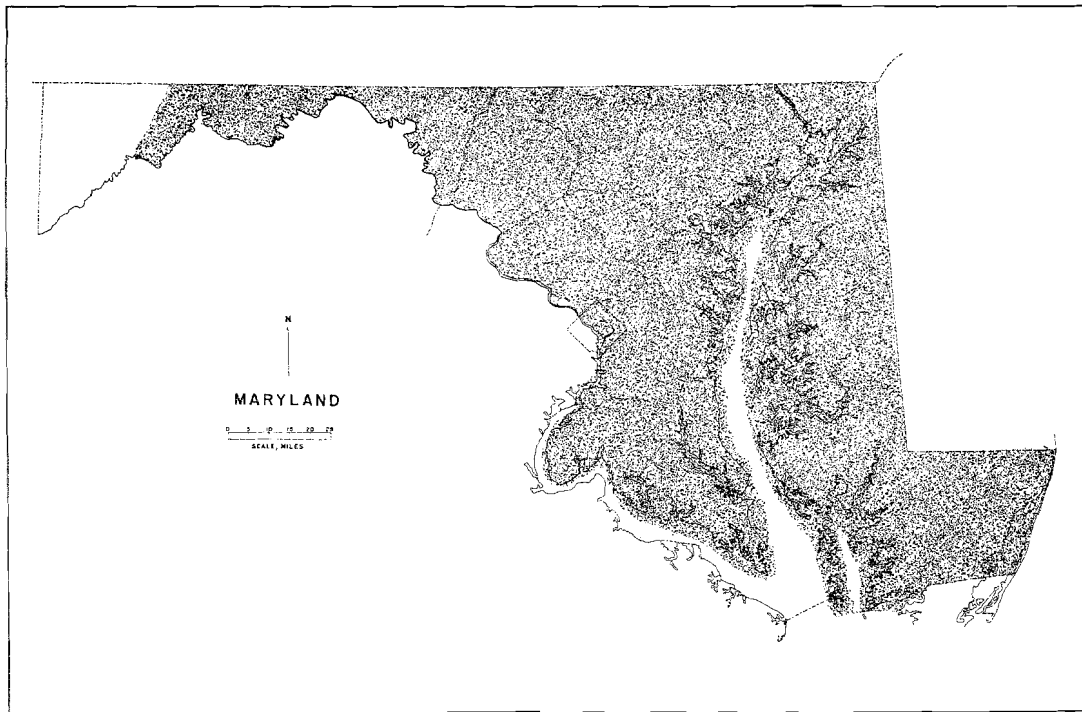
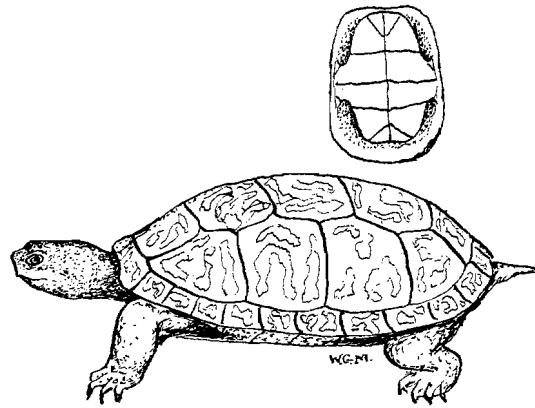


Maryland distribution of the Eastern Painted Turtle *Chrysemys picta picta* (Shaded) and the Midland Painted Turtle *Chrysemys picta marginata* (Dots). The central mottled region is a zone of overlap where either may be found.

**EASTERN PAINTED TURTLE—*Chrysemys picta picta***  
**MIDLAND PAINTED TURTLE—*Chrysemys picta marginata***

<b>General Description:</b>	Small flat smooth shelled turtle with red marking on shell edge. Notched upper jaw with cusp to each side. Plastron plain yellow or reddish. Head olive, legs with yellow or red stripes. In Midland Painted Turtle, carapace scute sutures are alternately united whereas on Eastern Midland Turtle they run straight across carapace (see adjacent page).
<b>Size:</b>	Usually 6-7 inches. Carapace 7 inches, plastron $6\frac{3}{4}$ inches unhinged. Weight less than a pound.
<b>Longevity:</b>	About 20 years.
<b>Fossils:</b>	Eocene era.
<b>Sexual Dimorphism:</b>	Female larger and broader than male, tail longer in male. Male develops long fore claws during breeding season.
<b>Habitat:</b>	Aquatic. Ponds, streams and lakes with vegetation.
<b>Breeding Season:</b>	April to July. Mating in spring and autumn.
<b>Eggs:</b>	5-8 smooth elliptical soft shelled blunt eggs laid May to July in soft soil in woods or open country in late afternoon. Incubation may last year but generally less.
<b>Breeding Behavior:</b>	Swims-facing front of female. Gently extends long claws to stroke lightly lores of female. Actual copulation not known.
<b>Habits:</b>	Gregarious. Diurnal, shy. Agile swimmers. Like to bask. Rather sedentary. Often wander far from water.
<b>Hibernation:</b>	In mud or bottom debris. October to March.
<b>Food and Feeding:</b>	Omnivorous and generally swallow food under water.
<b>Enemies:</b>	Man, leeches, skunks, squirrels and raccoons.
<b>Captivity:</b>	Excellent pet, breed readily.
<b>Economic Value:</b>	Flesh is palatable but too small for real value. Have been sold for \$1.00 per dozen. May serve as scavengers.

**RED-BELLIED TURTLE—*Pseudemys rubriventris***



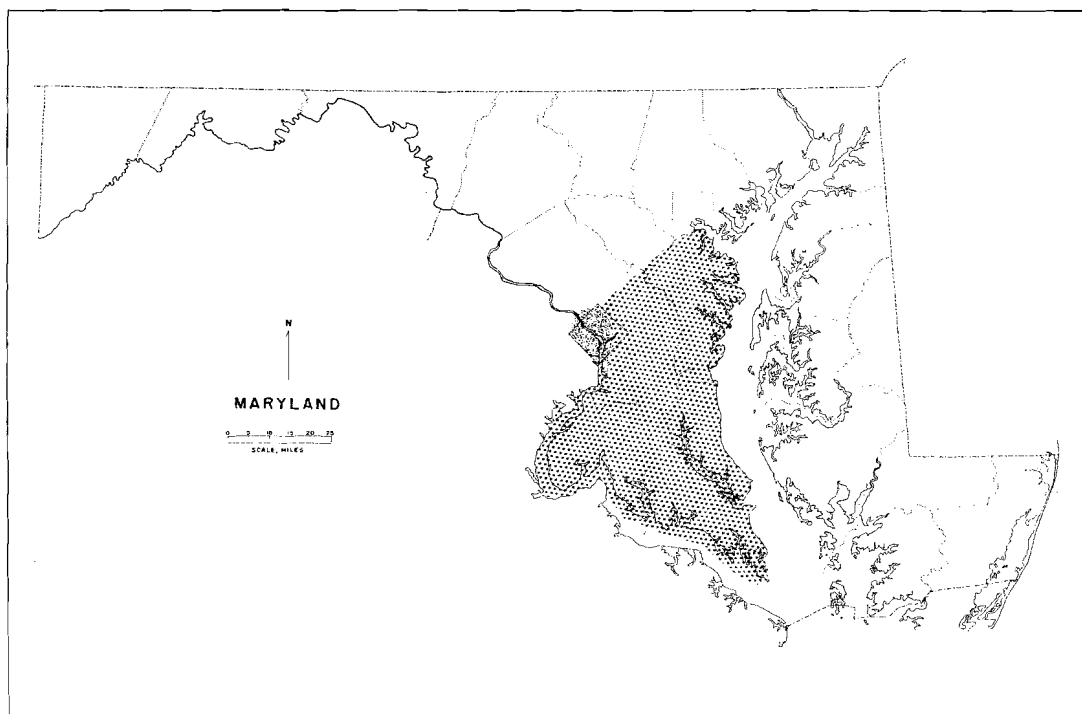
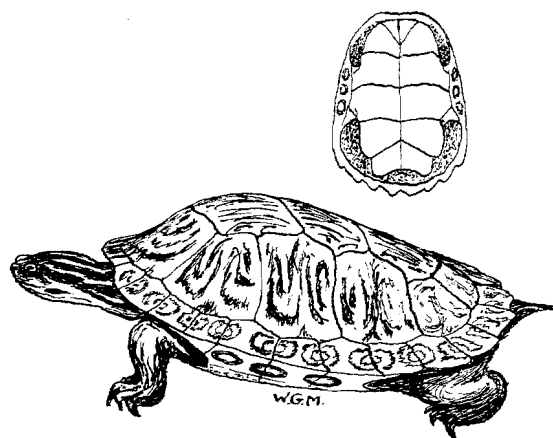
Maryland distribution of the Red-bellied Turtle *Pseudemys rubriventris*.

**RED-BELLIED TURTLE—*Pseudemys rubriventris***

<b>General Description:</b>	Upper jaw high and strongly notched and flanked by prominent cusp. Stripes on head not interrupted to form bars or sports. Plastron red colored.
<b>Size:</b>	May reach 16 inches, but usually 10 inches. Weight several pounds.
<b>Longevity:</b>	Unknown.
<b>Fossils:</b>	Pliocene era.
<b>Sexual Dimorphism:</b>	Male has long fore limb claws. Female larger than male and has convex plastron, male flat. Old males mottled with reddish brown. Females with vertical reddish line on each of first 3 costal scutes.
<b>Habitat:</b>	Streams, rivers, marshes, ponds, lakes and often brackist water.
<b>Breeding Season:</b>	June and July.
<b>Eggs:</b>	May lay 2 clutches of 6-12 eggs, 1 x $\frac{3}{4}$ inches, elliptical, white. Laid in June or July in cultivated sandy clay or loam near water 4 inches deep.
<b>Breeding Behavior:</b>	Unknown.
<b>Habits:</b>	Excellent swimmer and often in deep water. Shy, alert. Hisses when annoyed. Likes to bask.
<b>Hibernation:</b>	Perhaps on shallow bars. Apparently doesn't hibernate.
<b>Food and Feeding:</b>	Omnivorous, needs to swallow under water.
<b>Enemies:</b>	Crows, man.
<b>Captivity:</b>	Lives well, becomes very tame. Feeds well on variety of foods.
<b>Economic Value:</b>	Often sold as substitute for Diamondback Terrapin. Once supported good industry in Maryland, but nil since 1883.



FLORIDA COOTER—*Pseudemys floridana floridana*

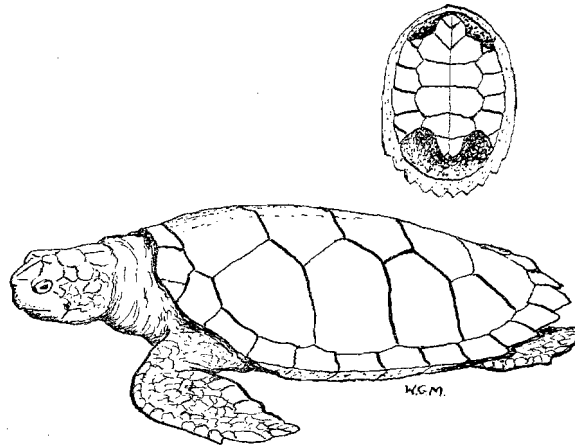


Known (shaded areas) and expected localities (dots) of the Florida Cooter *Pseudemys floridana floridana*, in Maryland

**FLORIDA COOTER**—*Pseudemys floridana floridana*

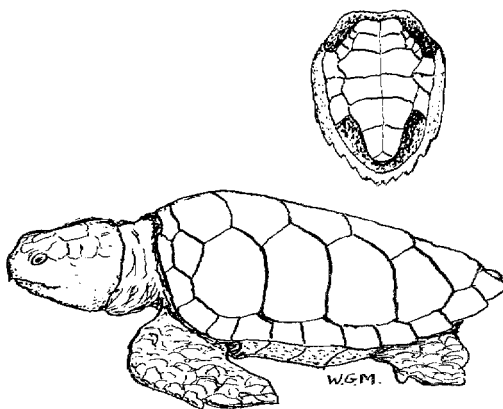
<b>General Description:</b>	Good sized high brown-shelled turtle with yellow marking on shell, neck and top of head. Unnotched upper jaw or weakly serrate. Plastral pattern unmarked yellow. Hollow ovals on underside of marginals.
<b>Size:</b>	Female up to 12 inches, males smaller—9 inches. Up to 6½ pounds in weight.
<b>Longevity:</b>	Unknown.
<b>Fossils:</b>	Pliocene.
<b>Sexual Dimorphism:</b>	Males with elongated claws on forelimbs. Smaller head and size than female.
<b>Habitat:</b>	Little discrimination, found in rivers, ponds, swamps or marshes.
<b>Breeding Season:</b>	Unknown.
<b>Eggs:</b>	Unknown.
<b>Breeding Behavior:</b>	Unknown.
<b>Habits:</b>	Shy. Likes to bask.
<b>Hibernation:</b>	Unknown.
<b>Food and Feedings:</b>	Algae.
<b>Enemies:</b>	Bears, raccoons, snakes, man, sewage and pollution.
<b>Captivity:</b>	Extremely wary.
<b>Economic Value:</b>	None.

**GREEN TURTLE**—*Chelonia mydas mydas*



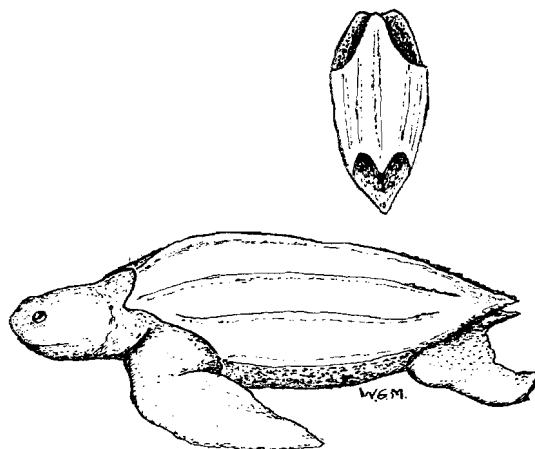
- General Description:** Paddle shaped limbs with one claw. A single pair of shields, prefrontals, between the eyes. Four costal shields, the first of which does not touch the nuchal.
- Size:** Carapace to 4 feet long and generally 300 pounds. The record weight is 800 pounds. Those in Maryland usually 250 pounds or less.
- Longevity:** Captive specimen lived for 15 years.
- Fossils:** Miocene, Chesapeake Beach, Maryland.
- Sexual Dimorphism:** Female tail short and rarely extends beyond carapace. Male tail to end of extended flippers.
- Habitat:** Lagoons and shoals of continents near sand or mud beaches or areas of vegetation.
- Breeding Season:** March to September depending on latitude, later in the year with northerly latitude.
- Eggs:** Spherical soft-shelled, white eggs  $1\frac{5}{8}$  inches in diameter, several hundred (100-175) to nest. Hatch in 47-62 days.
- Breeding Behavior:** Mate at sea with male dorsally mounted holding female with fore flippers. Mate before and during season usually at night, perhaps into the day. May dig many nests before laying eggs 2 at a time in more than one clutch.
- Habits:** Sleep floating or often on rocky island ledges.
- Hibernation:** Uncertain.
- Food and Feeding:** *Zostrea*, algae, crabs, snails.
- Enemies:** Man worst enemy. Sharks, rats, raptorial birds, raccoons.
- Captivity:** Docile, easy to keep. Require little attention if kept in natural waters. Feed crabs, fish, clams if in aquarium.
- Economic Value:** Most valuable of sea turtles for food, eggs or oil. Exploitation has brought species to near extinction.

ATLANTIC LOGGERHEAD TURTLE—*Caretta caretta caretta*



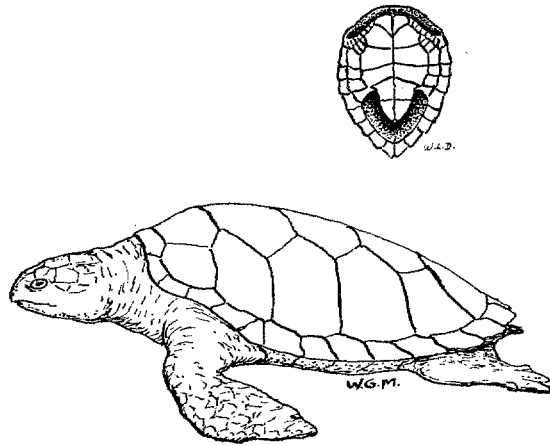
- General Description:** Flippers with 2 claws. Two pairs of shields, prefrontals, between eyes; 5 rows of costals, the first of which always touches nuchal.
- Size:** Generally carapace 28-84 inches. Weight of 300 pounds. Record is 9 feet, 850 pounds. Those in Maryland usually of 150-300 pounds in weight.
- Longevity:** In captivity known to live 33 years.
- Fossils:** Pleistocene of Florida.
- Sexual Dimorphism:** Male tail reaches beyond end of flipper; female to edge of carapace.
- Habitat:** Marine, occasionally entering streams and lagoons where vegetation may exist.
- Breeding Season:** May to August, depending on latitude.
- Eggs:** Soft white spherical egg approximately  $1\frac{5}{8}$  inches in diameter laid usually in 3 separate clutches up to 150 in number. Hatch in 2 months.
- Breeding Behavior:** Female migrates to high tide after dark to lay eggs. Mating probably at sea.
- Habits:** Fairly aggressive. Sleep while floating.
- Hibernation:** None. Known to withstand temperature down to  $13^{\circ}$  F.
- Food and Feeding:** Crabs, shellfish, conchs, fish and jellyfish
- Enemies:** Man greatest. Pigs and raccoons destroy nests.
- Captivity:** Quite readily adaptable, however, occasionally are overly aggressive.
- Economic Value:** Eggs are a delicacy, flesh inferior to that of the Green Turtle. Oil is often used to soften leather.

LEATHERBACK TURTLE—*Dermochelys coriacea*



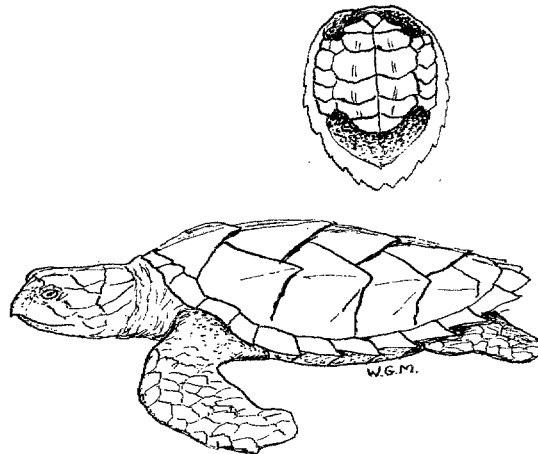
- General Description:** Paddle shaped flippers devoid of claws. Shell covered with smooth skin; 7 permanent ridges extend down brown or black back which often has whitish spots.
- Size:** Up to 7½ feet and 1902 pounds. Specimen recently caught (1959) off South Carolina was 7½ feet long and weighed 1100 pounds.
- Longevity:** Unknown.
- Fossils:** Miocene?
- Sexual Dimorphism:** Male tail reaches well beyond the hind limbs, narrow hips, plastron concave; female plastron convex and tail shorter than hind legs.
- Habitat:** Widely ranging marine species to Maine and Northern California along U. S. Coasts. Prefers water over 50 feet deep.
- Breeding Season:** May to June on beaches of fine sand.
- Eggs:** Soft, white, 2¼ inches in diameter; 150 laid 2 or 3 at a time in 3 or 4 clutches. Hatch in 58-65 days.
- Breeding Behavior:** Unknown.
- Habits:** May sleep while floating at surface.
- Hibernation:** Unknown.
- Food and Feeding:** Jellyfish, algae, crustaceans.
- Enemies:** Man, when captured.
- Captivity:** No large specimen has ever been kept in captivity. Two young specimens were kept for 2 weeks.
- Economic Value:** None. Oil is used in some parts of the world for canoe varnish.

**ATLANTIC RIDLEY TURTLE—*Lepidochelys kemp***



The smallest of the sea turtles and widely known as the "bastard turtle" because of the erroneous belief that it is a cross between the loggerhead and green turtles. It has 4 scutes on the bridge which joins the plastron to the carapace while the loggerhead has 3. Its limbs are paddle-shaped and each has 3 claws. There are 2 pairs of prefrontals between the eyes. Five costals exist of which the first touches the nuchal. Generally reach 2 feet in carapace length. Because of the confusion between this species and the loggerhead, little is known of the biology of this species. Records of this species from Maryland waters are lacking.

**HAWKSBILL TURTLE—*Eretmochelys imbricata***



Another species that may occur in Maryland waters. A species that has 2 claws per limb and 2 pairs of prefrontals between the eyes. Four costals, the first of which does not touch the nuchal plate, differentiate this species from the loggerhead and Ridley turtles which have 5 or more costal scutes, the first of which touches the nuchal plate. The hawksbill generally reaches a 2½ foot size and 100 pounds in weight. A rather aggressive, pugnacious species. A hardy species which is of value for its shell.

**KEY TO THE TURTLES NATURALLY FOUND OR  
INTRODUCED (\*) INTO MARYLAND**

- |    |   |                  |
|----|---|------------------|
| 1  | Limbs modified into flippers.....   | 1920             |
| 1  | Limbs not modified into flippers, but with claws .....  | 2                |
| 2  | Shell covered with horny scutes.....  | 3                |
| 2  | Shell not covered with horny plates, leathery—<br>Eastern Spiny Soft Shell Turtle, <i>Trionyx ferox spinifera</i> *   |                  |
| 3  | Tail longer than hind legs, rough with high tubercles or scales on its upper surface—<br>Snapping Turtle, <i>Chelydra serpentina</i>  |                  |
| 3  | Tail shorter than hind legs, without dorsal tubercles .....   | 4                |
| 4  | Plastron with less than 12 plates, carapace does not flare outward.....   | 5                |
| 4  | Plastron with 12 or more plates, carapace does flare outward.....   | 6                |
| 5  | Head with two yellow lines on each side, pectoral plate rectangular, one hinge—<br>Stinkpot, <i>Sternotherus odoratus</i>   |                  |
| 5  | Head without two yellow lines on each side, pectoral plate triangular, 2 hinges—<br>Eastern Mud Turtle, <i>Kinosternum subrubrum subrubrum</i>  |                  |
| 6  | Plastron with one transverse hinge, 5th toe of rear foot absent—Eastern Box Turtle<br><i>Terrapene carolina carolina</i>  |                  |
| 6  | Plastron with 2 or without hinges, 5th toe present but clawless .....   | 7                |
| 7  | Carapace with small yellow spots—<br>Spotted Turtle, <i>Clemmys guttata</i>   |                  |
| 7  | Carapace with <sup>just</sup> small yellow spots .....  | 8                |
| 8  | Head and neck with longitudinal yellow stripes .....  | 9                |
| 8  | Head and neck without longitudinal yellow stripes .....   | <del>16</del> 17 |
| 9  | Upper jaw not notched in front.....   | 10               |
| 9  | Upper jaw notched in front.....   | 12               |
| 10 | Length of lower jaw symphysis $\frac{1}{4}$<br>longer than distance between orbits<br>(Figure 2), small (narrower than<br>orbit) more or less triangular; yellow<br>spot behind eye; a distinct vertical<br>light line between spot and eye;<br>mid-dorsal spines not prominent—<br>Map Turtle <i>Graptemys geographica</i> |                  |

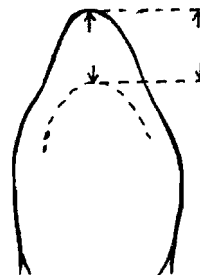


Figure 2: Measurement of Symphysis length on  
lower jaw.

10 Length of lower jaw symphysis equal to or less than least interorbital distance; mid-dorsal spines prominent and knoblike..... 11

11 A large (at least as wide as diameter of orbit) crescentic or transverse yellow spot or line behind eye. No or only faint lines between this spot and eye; neck stripes reach the eye—  
False Map Turtle, *Graptemys pseudogeographica*\*

11 A crescentic yellow line behind ( $\frac{1}{2}$  as wide as) eye that extends downward and forward under the eye; neck stripes never reach eye; spines of vertebral shields broadened and knoblike—  
Mississippi Map Turtle, *Graptemys kohni*\*

12 First marginal extending beyond suture between 1st costal and 1st vertebral (Figure 3)..... 13

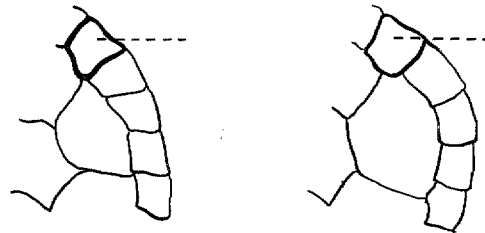


Figure 3: Anterior marginal shields not extending as in *Chrysemys* (A) and extending beyond suture between 1st costal and vertebral as in *Pseudemys* (B).

12 First marginal not extending beyond suture between 1st costal and 1st vertebral..... 15 <sup>1/2</sup>

13 Lower jaw when viewed head-on is rounded (Figure 4) ..... 14

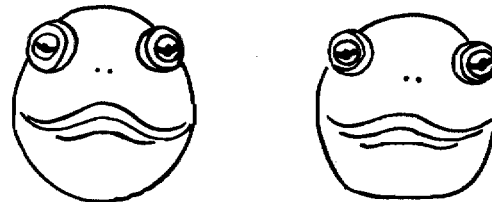


Figure 4: Head-on view of lower jaw illustrating rounded (A) and flattened (B) lower jaw conditions.

13 Lower jaw when viewed head-on is flattened ..... 15

14 Vertical black bars present on upper jaw, yellow stripe beyond eye—  
Cumberland Turtle, *Pseudemys scripta troosti*\*

14 Vertical black bars absent on upper jaw, broad red stripe behind eye—  
Red-eared Turtle, *Pseudemys scripta elegans*\*

15 Upper jaw toothed and serrated, plastron reddish with or without dark blotches—  
Red-Bellied Turtle, *Pseudemys rubriventris*

15 Upper jaw weakly toothed and serrated or not so, plastron yellow—  
Florida Cooter, *Pseudemys floridana floridana*

16 Carapace acute sutures run straight across—  
Eastern Painted Turtle, *Chrysemys picta picta*

16 Carapace scute sutures do not run straight across but alternate—  
Midland Painted Turtle, *Chrysemys picta marginata*



- 17 Head with large orange-yellow spot on each side—Bog Turtle, *Clemmys muhlenbergi*
- 17 Head without large orange or yellow spot on each side ..... 17/8
- 18 Carapace without pronounced concentric rings or roughly sculptured—  
Red-Bellied Turtle, *Pseudemys rubriventris*
- 18 Carapace with pronounced concentric rings and roughly sculptured..... 18/19
- 19 Head and legs orange or salmon colored—.....Wood Turtle, *Clemmys insculpta*
- 19 Head and legs gray spotted or streaked with black—Northern Diamondback Terrapin  
*Malaclemmys terrapin terrapin*
- 20 Carapace with 7 prominent longitudinal ridges, leathery, no scutes—  
Atlantic Leatherback, *Dermochelys coriacea coriacea*
- 20 Carapace normal, scutes present..... 20/21
- 21 Five costal plates (sometimes more in Loggerhead), 1st touching the nuchal..... 21/22
- 21 Four costal plates, 1st not touching  
the nuchal (Figure 5)..... 22/23

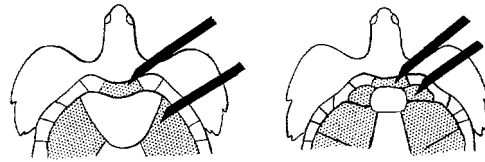


Figure 5: Nuchal separated from costal scute (A);  
Nuchal touches first costal scute (B).

- 22 Scutes overlap, 2 pair of plates between eyes—  
Atlantic Hawksbill, *Eretmochelys imbricata imbricata*
- 22 Scutes do not overlap, 1 pair of plates between eyes—  
Atlantic Green Turtle, *Chelonia mydas mydas*

- 23 Four bridge scutes (Figure 6)—  
Atlantic Ridley *Lepidochelys kempfi*

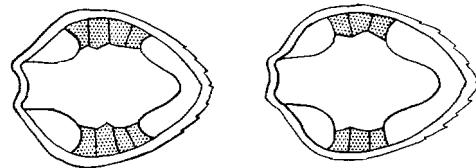


Figure 6: Stippled area illustrates bridge between  
Carapace and Plastron with 4 (a) and 3 (B) scutes.

- 23 Three bridge scutes—  
Atlantic Loggerhead, *Caretta caretta caretta*

**Maryland and general references to which one may refer for  
additional information on turtles:**

- Barton, A. J. and J. W. Price, Sr. 1955. Our knowledge of the bog turtle *Clemmys muhlenbergi* surveyed and augmented. *Copeia* 3:159-165.
- Bierly, E. J. 1954. Turtles in Maryland and Virginia. *Atlantic Naturalist* 9(5):244-249, ill.
- Brady, M. K. 1937. Natural history of Plummer's Island, Maryland. V. Reptiles and amphibians. *Proc. Biol. Soc. Wash.* 50:137-140.
- Cagle, F. R. 1957. Pt. 4. Reptiles. *In* *Vertebrates of the United States*. McGraw Hill Co., N. Y. pp. 275-295.
- Caldwell, D K. 1960. Sea turtles of the United States. Fish. Leaflet 1492. U. S. Fish and Wildlife Service, 1-20.
- Carr, A. 1952. Handbook of turtles. Comstock Publ. Assoc., Inc., Ithaca, N. Y.
- Chambliss, S. 1959. In sight, but out of mind. *Skipper Magazine* XIX(10):18-21, 37-40.
- Cochran, Doris M. 1952. Nature's tank, the turtle. *Nat. Geog. Mag.* CI(5):665-684.
- Cohen, E. 1936. A key to Maryland turtles we should know. *Nat. Hist. Soc. Md. Junior Bull.* 1(2):4-6. October.
- Coker, R. E. 1906. The cultivation of the diamondback terrapin. *N. C. Geol. Surv. Bull.* 14:1-69.
- Collins, R. and W. G. Lynn. 1934. Fossil turtles of Maryland. *Amer. Philos. Soc. Tr.* 30(6):63-88.
- Conant, R. 1958. Field guide to reptiles and amphibians of the United States. Houghton Mifflin Co., Boston. XV 366 pp.
- . 1958. Annotated check list of the amphibians and reptiles of Del-Mar-Va Peninsula.
- Cooper, J. E. 1949. Additional records for *Clemmys muhlenbergi* from Maryland. *Herpetologica* 5:75-76.
- . 1959. The turtle *Pseudemys scripta* feral in Maryland. *Herpetologica* 15:44.
- Fowler, H. W. 1915. Some amphibians and reptiles of Cecil County, Maryland. *Copeia* 22:37-40.
- . 1925. Records of amphibians and reptiles for Delaware, Maryland and Virginia. II Maryland. *Copeia* 145:61-64.
- Gould, E. 1959. Studies on the orientation of turtles. *Copeia* 2:174-176.
- Hay, O. P. 1901. The fossil turtles of North America. *Publ. Carnegie Inst. Wash.* 75:568 pp., 113 pls.

- Hay, W. P. 1902. The list of Batrachians and reptiles of the District of Columbia and vicinity. Proc. Biol. Soc. Wash. 15: 121-145.
- Hildebrand, S. F. and C. Hatal. 1932. Growth of the diamondback terrapins, size attained, sex ratio and longevity. Zoologica 9: 551-563.
- Keim, T. D. 1914. Amphibians and reptiles of Jennings, Maryland. Copeia 2: 2.
- Latrobe, F. C. 1939. The diamondback terrapin. 20th Century Press, Baltimore. 29 pp., ill.
- McCauley, R. H. 1945. The reptiles of Maryland and the District of Columbia. Private printing, Hagerstown, Md., 194 pp., ill.
- and C. S. East. 1940. Amphibians and reptiles from Garrett County, Maryland. Copeia 2: 120-123.
- and R. Mansueti. 1943. *Clemmys muhlenbergi* in Maryland. Copeia 3: 197.
- Mansueti, R. 1939. Reptiles noted during 1938 in and around the Patapsco State Park. Nat. Hist. Soc. Md. Junior Bull. 3(1): 5-11. 3 pls., 14 hand-colored figs.
- . 1941. A descriptive catalogue of the amphibians and reptiles found in and around Baltimore City, Maryland, within a radius of twenty miles. Proc. Nat. Hist. Soc. Md. 8: 1-42, ill.
- . 1942. Notes on the herpetology of Calvert County, Maryland. Md. Nat. Hist. Soc. Bull. 12: 33-43, ill.
- and D. W. Wallace. 1960. Notes on the soft-shell turtle (*Trionyx*) in Maryland waters. Chesapeake Science 1(1): 71-2.
- Mosimann, J. E. 1958. The revolutionary significance of rare matings in animal populations. Evol. XII(2): 246-261.
- Norman, J. E. 1949. Maryland turtles. Md. Naturalist 19(1): 13-16.
- Pope, C. H. 1946. Turtles of the United States and Canada. Alfred Knopf Co., N. Y. 343 pp. 199 photos.
- Romer, A. S. 1941. Man the the vertebrates. Univ. Chicago Press. 405 pp.
- Stickel, Lucille F. 1950. Population and home range relationships of the box turtle, *Terrapene c. carolina*. Ecol. Monog. 20: 351-378.
- Tinklepaugh, O. 1932. Maze learning of a turtle. Jour. Comp. Psychology 13: 201-206.
- Williams, F. R. and J. B. Hanzley. 1953. New county records for the wood turtle (*Clemmys inscripta*) in Maryland. Md. Naturalist (1-2): 22-23.
- Young, J. Z. 1950. The life of the vertebrate. Oxford Clarendon Press, pp. 349-407.