

TURTLES

OF THE UNIVERSITY OF MISSISSIPPI
FIELD STATION

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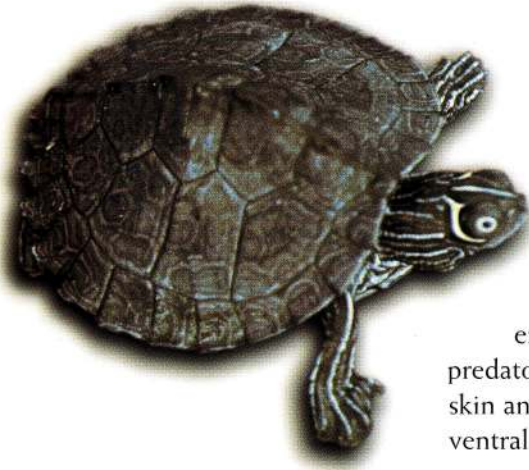
About the Author

Dr. Edmund Keiser's first contribution to The University of Mississippi Field Station Series introduced us to the salamanders of the field station. Drawing again on his extensive knowledge of the amphibians and reptiles of the southeastern United States, in this most recent contribution, the 11th in The University of Mississippi Field Station Series, Dr. Keiser gives us an exciting look at some of the most visible vertebrate animals at the field station: turtles. The booklet presents easy-to-understand descriptions of the turtle species along with straightforward keys that can be easily used by students and amateur naturalists. Notes on the ecology and behavior of the turtle species of the field station are also provided. It is a great pleasure to once again learn from one of the most accomplished scientists and teachers at The University of Mississippi.

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TURTLES

OF THE UNIVERSITY OF MISSISSIPPI FIELD STATION



Turtles are reptiles having scaly skins, bony shells, toothless skulls, and pectoral girdles inside rather than outside the rib cage. Turtles evolved during the Triassic period, more than 200 million years ago. The earliest ones existed before the dinosaurs and prior to the appearance of the birds and mammals. Turtles, the oldest group of the surviving reptiles, have changed little since their origin. They can be found in freshwater, marine, and terrestrial environments.

Perhaps because of their shells, turtles have fascinated humans since time immemorial. The shell is a remarkably effective armor, enabling its possessor to withdraw into shelter rather than flee a potential predator. The shell consists of ribs, vertebrae, and dermal bones overlain by skin and/or epidermal scutes. The dorsal part is called the "carapace," and the ventral component, the "plastron." These two are joined by a bony "bridge."

Turtles live longer than most other vertebrate animals. There are many records of turtle longevity in excess of 50 years. Box turtles of the genus *Terrapene* have been known to live more than 100 years, and certain other species may even exceed this. Despite this longevity, turtle populations around the world are decreasing alarmingly due to factors including habitat destruction; pollution by pesticides, herbicides, and other chemicals; overharvesting for food and pets; and predation.

The diet of Mississippi turtles varies with the species, but most are omnivorous. Most are also opportunistic, and, despite preferences, will feed on other items as available. They may ambush or actively search for prey.

Courtship and mating of Mississippi turtles typically occurs during the spring months, but may take place at other times. Spermatozoa are stored by the female and may remain capable of fertilizing oocytes for one or more years. The eggs have yolk and calcareous or leathery shells.

As a rule, eggs are deposited in nest holes excavated by the females, although females of some species may leave their eggs in shallow depressions under mats of shoreline vegetation or other cover objects. Nesting in northern Mississippi typically begins about the middle of May and extends through June, although earlier and later nesting is known. Raccoons, armadillos, crows, and other vertebrates feed on the eggs and destroy a high percentage of turtle nests at The University of Mississippi Field Station (UMFS).



Incubation temperatures during a certain period of embryonic development determine the sex of hatchlings. Most hatchlings emerge from the nests from late July through September. Rarely, young will overwinter within the nest and emerge the following spring. Young turtles grow rapidly until sexual maturity is reached. They continue to grow throughout life but at a much slower rate after reaching adulthood.



All Mississippi turtles except the highly terrestrial gopher tortoise (*Gopherus polyphemus*) and the eastern box turtle (*Terrapene carolina*) are aquatic. Most will leave the water only for basking, migratory movements, and egg laying. Of the two terrestrial species, only the eastern box turtle occurs at the field station. Although they spend most of their time on land, box turtles swim readily and will often enter streams and ponds.

Approximately 240 species of turtles survive in the world today, and 56 of these are found within the United States and its coastal waters. Mississippi has 29 or 30 species of turtles representing seven families. A list of these is included in the appendix on Page 21.

The University of Mississippi main campus is in Oxford, Lafayette County, in northern Mississippi. The field station is approximately 11 miles northeast of the campus on County Road 202. The station has more than 200 spring-fed ponds located within a 2.4-mile, V-shaped valley surrounded by wooded hills.

Ten species have been recorded within the present boundaries of The University of Mississippi Field Station. These are summarized on Page 4. Of the 10 UMFS species, only one, the alligator snapping turtle (*Macrochelys temminckii*), is rarely seen in field station ponds. The other nine species are frequently encountered within their respective habitats.

Spiny softshells (*Apalone spinifera*), false map turtles (*Graptemys pseudogeographica*), and eastern river cooters (*Pseudemys concinna*) are typically associated with the larger UMFS ponds, while the other seven species can be found in ponds of all sizes. Common snapping turtles (*Chelydra serpentina*), common musk turtles (*Sternotherus odoratus*), sliders (*Trachemys scripta*), and eastern mud turtles (*Kinosternon subrubrum*) may also be found in the roadside ditches, peripheral streams, and in the marginal shallow swamps. Individuals of all UMFS turtle species will occasionally move overland, but only the eastern box turtle is primarily terrestrial.

During the early 1990s, a turtle was collected in a shallow UMFS pond that was, on cursory examination, tentatively identified as a stripeneck mud turtle, *Sternotherus minor peltifer*. This species had not previously been seen at the station. Unfortunately, the specimen was inadvertently released prior to the identity being verified. In the absence of verification and subsequent sightings, the stripeneck mud turtle is not included on the field station species list (Page 4).

In recent years, many authorities (e.g. Ernst, Lovich, and Barbour, 1994; Conant and Collins, 1998) have omitted Mississippi from the range of the Florida cooter (*Pseudemys floridana*). However, many turtles of the genus *Pseudemys* at UMFS and elsewhere in Mississippi have carapacial and plastral patterns characteristic of *P. floridana*. Coloration patterns currently diagnostic for both *P. floridana* and *P. concinna* can be present in hatchlings from the same nests in Mississippi. If *P. floridana* is indeed a species that does not occur in Mississippi, the presently recognized diagnostic features are not valid for identification.

Identification of UMFS Turtles

Identification of juvenile and adult UMFS turtles is not difficult. A checklist of species, an identification key, and individual accounts of species follow this section. The identification key, species accounts, and photographs can be used as aids in determining the species of a field station turtle. With these guides and a little practice, one can quickly learn to identify the field station species. Carapacial and plastral scute (scale) names are shown in Figures 1 and 2. Other terms are in the Glossary of Terms and Abbreviations on Page 20.

An identification key is an arrangement of species attributes presented as a numbered series of choices. The choices are arranged in pairs termed "couplets."

In the following key, the user will begin at couplet 1 and compare the characteristics of the turtle in hand with those of the two choices in the couplet. The choices will either lead to the vernacular name of the species in hand or to the number of the next couplet to be considered. For example, if the specimen to be identified in couplet 1 has a leathery carapace and lacks horny scutes, it is a **spiny softshell**. If it has horny scutes, the user will then go to couplet 2 and again decide which of the two choices applies. If properly utilized, the key should help the user identify most juvenile and adult turtles encountered at the field station.

All key determined identifications should be verified by reading the species account descriptions and studying the color plates.

Fig. 1

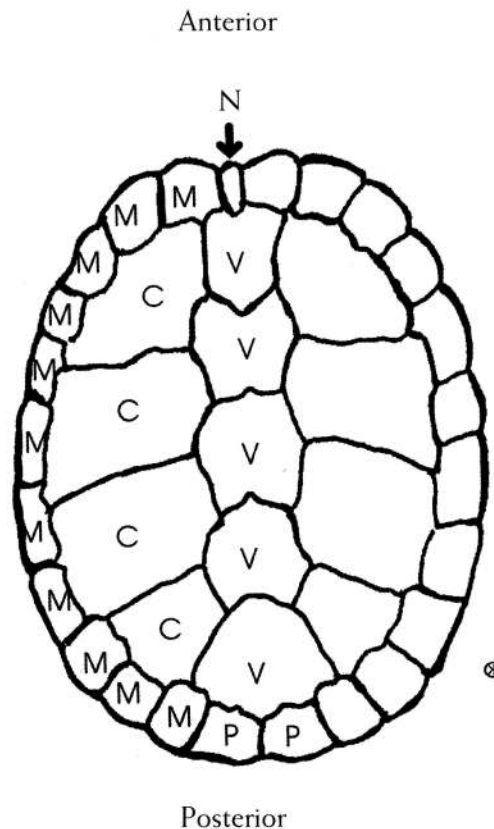


Figure 1. Scutes of a generalized turtle carapace. Dorsal View. C = costal, M = marginal, N = nuchal, P = pygal, V = vertebral.

Fig. 2

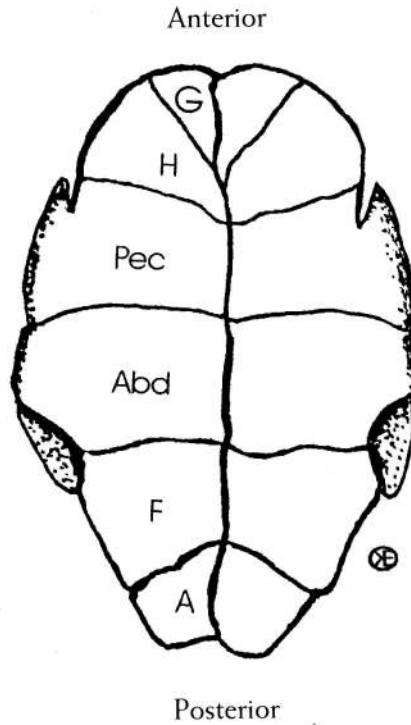


Figure 2. Scutes of a generalized turtle plastron. Ventral View. From anterior to posterior: G = gular, H = humeral, Pec = pectoral, Abd = abdominal, F = femoral, A = anal.

TURTLES

OF THE UNIVERSITY OF MISSISSIPPI FIELD STATION

FAMILY CHELYDRIDAE

- Alligator Snapping Turtle *Macrochelys temminckii* (Harlan)
- Common Snapping Turtle..... *Chelydra serpentina* (Linnaeus)

FAMILY EMYDIDAE

- Painted Turtle..... *Chrysemys picta* (Schneider)
- False Map Turtle *Gratemys pseudogeographica* (Gray)
- Eastern River Cooter *Pseudemys concinna* (LeConte)
- Eastern Box Turtle..... *Terrapene carolina* (Linnaeus)
- Slider *Trachemys scripta* (Schoepff)

FAMILY KINOSTERNIDAE

- Common Musk Turtle *Sternotherus odoratus* (Latreille)
- Eastern Mud Turtle *Kinosternon subrubrum* (Lacepede)

FAMILY TRIONYCHIDAE

- Spiny Softshell *Apalone spinifera* (LeSueur)

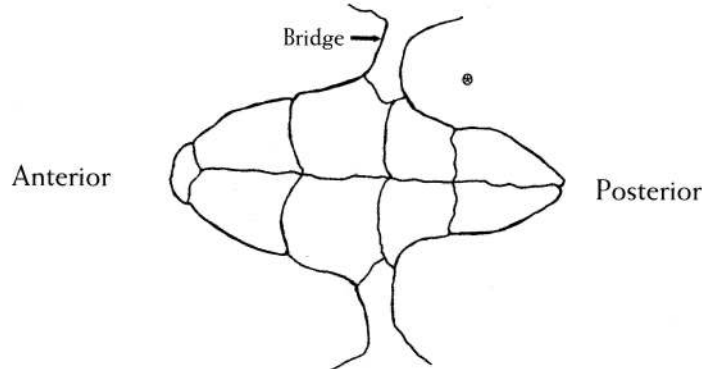
Key to the Turtles

OF THE UNIVERSITY OF MISSISSIPPI FIELD STATION

- 1. Carapace leathery and lacking horny scutes; margins of carapace flexible SPINY SOFTSHELL
- Carapace covered by horny scutes; margins of carapace rigid 2

- 2. Plastron cross-shaped, with narrow bridge (Fig. 3); tail more than half the greatest length of the plastron . . . 3

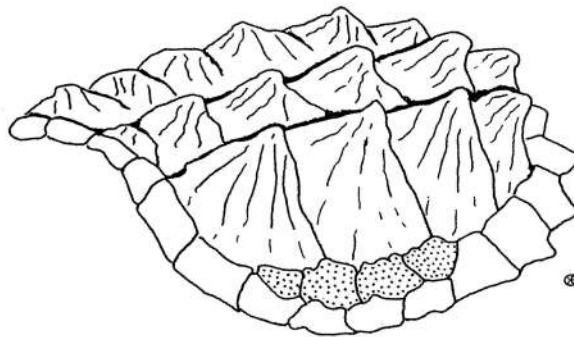
Fig. 3



- Plastron not cross-shaped; bridge wide; tail less than half the length of the plastron 4

- 3. Carapace with three prominent keels extending the full length; a row of supramarginal scutes between marginal and costal scutes (Fig. 4) ALLIGATOR SNAPPING TURTLE

Fig. 4

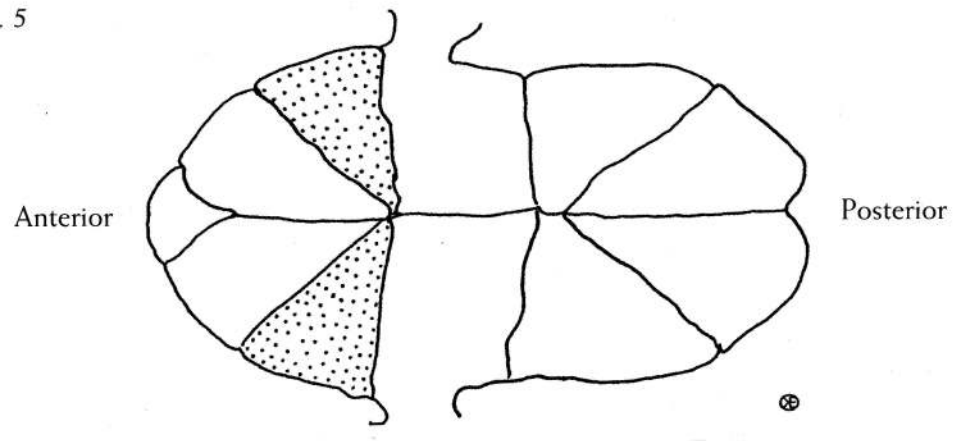


Supramarginal scutes shaded.

- Keels of carapace low or absent (if present, not extending the full length of the carapace); no row of supramarginal scutes between the marginal and costal scutes COMMON SNAPPING TURTLE

- 4. Plastron with 10 or 11 horny scutes 5
- Plastron with 12 horny scutes 6
- 5. Scutes of plastron not separated by skin; pectoral scute roughly triangular; two prominent plastral hinges (Fig. 5) EASTERN MUD TURTLE

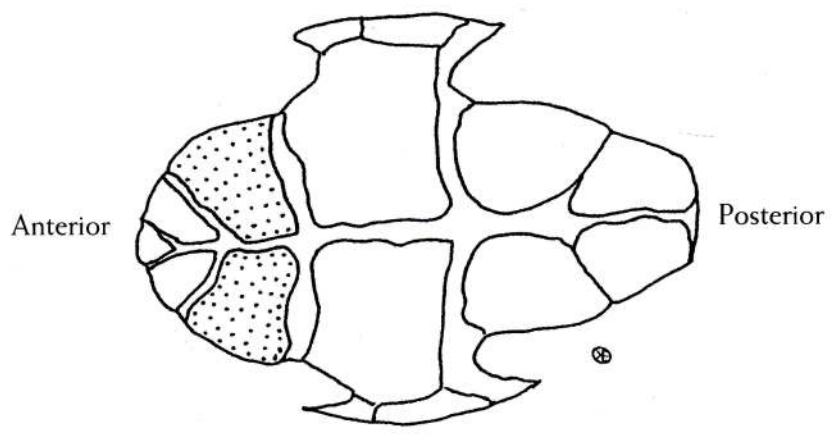
Fig. 5



Pectoral scutes shaded.

- Scutes of plastron separated by skin; pectoral scute roughly quadrangular; one indistinct plastral hinge (Fig. 6) COMMON MUSK TURTLE

Fig. 6

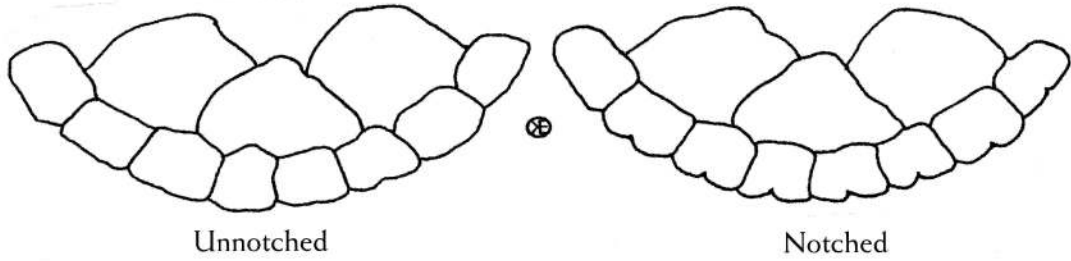


Pectoral scutes shaded. Scutes separated by skin.

- 6. Plastron with single, prominent hinge EASTERN BOX TURTLE
- Plastron lacking hinge 7

7. Posterior margin of carapace unnotched or notched, but not serrated (Fig. 7); carapace with medial red or orange stripe PAINTED TURTLE

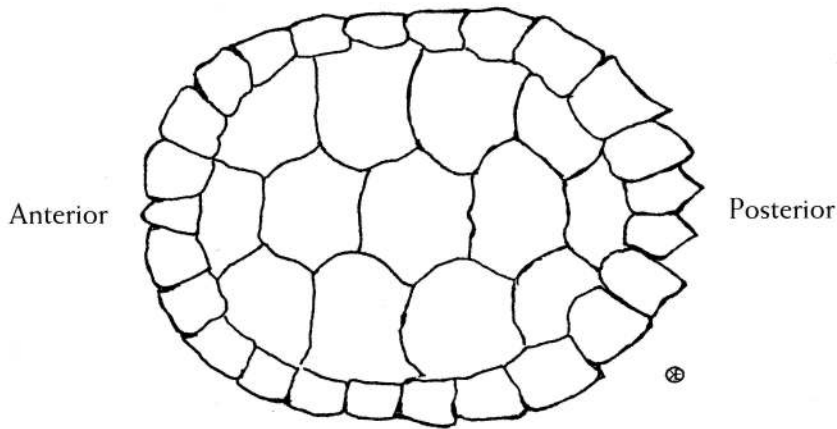
Fig. 7



Posterior carapace not serrated.

Posterior margin of carapace moderately to strongly serrated (Fig. 8); carapace lacking red or orange medial stripe 8

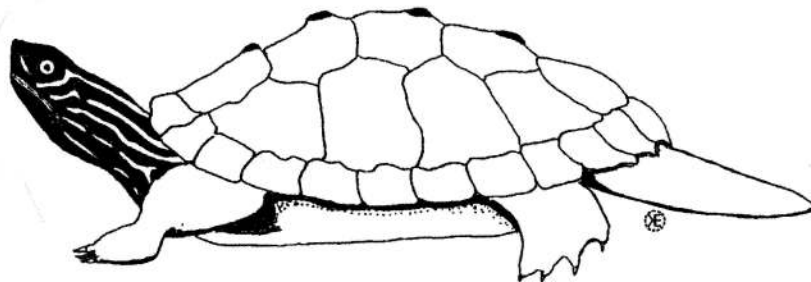
Fig. 8



Posterior carapace strongly serrated.

8. Carapacial keel conspicuous and with low, but prominent, spines or knobs; yellow crescent-shaped mark borders the eye posteriorly (Fig. 9) FALSE MAP TURTLE

Fig. 9

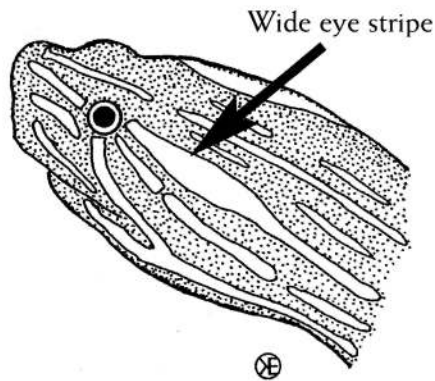


Carapacial keel with low knobs. Yellow crescent behind eye.

Carapacial keel inconspicuous or absent and spines or knobs are lacking; no yellow crescent-shaped mark bordering the eye posteriorly 9

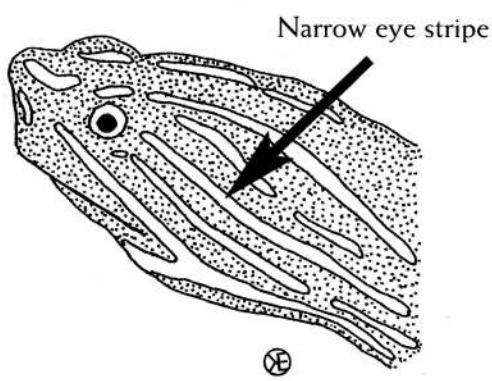
9. Stripe behind eye wide (at least half the diameter of the eye. See Fig. 10) and dull red or yellow; underside of lower jaw rounded. RED-EARED SLIDER

Fig. 10



Stripe behind eye narrow (less than half the diameter of the eye. See Fig. 11) and yellow, never red (Fig.11); underside of jaw flattened EASTERN RIVER COOTER

Fig. 11



ALLIGATOR SNAPPING TURTLE

Macrochelys temminckii (Harlan)

Identification

These are the largest turtles in Mississippi. Large adults may have carapace lengths (CL) in excess of 24 inches and body weights of more than 175 pounds. Juveniles and adults have very large heads and strongly hooked beaks. Dorsal keels are in three conspicuous rows that extend the length of the carapace. The keels are prominent even in old adults. A row of supramarginal scutes is inserted above the marginals. The eyes are lateral and not visible when looking down upon the head. A ring of small fleshy projections encircles each orbit. The tail has three rows of dorsal tubercles and is nearly as long as the carapace.



Alligator Snapping Turtle

Edmund D. Keiser

Similar Species

Hatchlings of common snapping turtles also have large heads and dorsal keels in three conspicuous rows. Hatchlings and adults can be distinguished from common snapping turtles by their larger heads, lateral eyes, rows of supramarginal scutes, and strongly hooked beaks.

Taxonomic Comments

No subspecies are recognized.

General Comments

Alligator snapping turtles are rarely encountered at the field station. In the late 1980s, a very large individual escaped from a station holding pen. On several subsequent occasions, a huge alligator snapping turtle, believed to be this individual, has been observed moving over UMFS pond levees. Smaller specimens have been seen on at least two occasions during the last 20 years.

These turtles feed on crustaceans, mollusks, fishes, amphibians, reptiles including other turtle species, carrion, and aquatic plants. Mating typically occurs in the spring or fall months, and nesting extends from May to early June. Clutch size ranges from fewer than 10 eggs to more than 40. Nests have not been found at the field station. The incubation period varies considerably with temperature and the development of the embryos at the time of egg deposition.

Hatchlings can be anticipated in late summer and early fall. The sexes of adults can be recognized by their precloacal tail lengths, which average 169 mm for males and only 84 mm for females (Ernst, Lovich, and Barbour, 1994: 19). Field studies elsewhere in Mississippi suggest that this species is rapidly declining in numbers. Individuals encountered at the UMFS should be left undisturbed. A moderate-sized adult can easily amputate a finger with its bite.

COMMON SNAPPING TURTLE

Chelydra serpentina (Linnaeus)

Identification

Large adults have carapace lengths in excess of 18 inches and body weights of more than 20 pounds. Individuals have large heads and weakly hooked beaks. Dorsal keels are low to moderate in juveniles and small adults and in three rows. The keels consist of low knobs toward the rear of the scutes. Keels and knobs are typically absent or inconspicuous in large adults. Supramarginal scutes are absent. The eyes are dorsolateral and can be seen from above. They are not ringed by fleshy projections. The tail has three rows of dorsal tubercles and is nearly as long as the carapace.



Common Snapping Turtle

Edmund D. Keiser

Similar Species

Hatchlings and juveniles are similar to alligator snapping turtles but can be easily distinguished by their smaller heads, weakly hooked beaks, absence of supramarginal scales, and the dorsolateral eyes, which lack a ring of fleshy projections.

Taxonomic Comments

The subspecies found at the field station is *Chelydra serpentina serpentina* (Linnaeus), the common snapping turtle.

General Comments

Common snapping turtles are frequently encountered at the field station. They can be found in all ponds, peripheral drainage ditches, springs and spring seeps, and marginal swamps.

These turtles feed on annelid worms, crustaceans, insects, mollusks, fishes, amphibians, reptiles including other turtle species, birds, small mammals, carrion, algae, and aquatic plants. Mating can occur in the spring, summer, or fall, and the nesting season typically extends from mid-May to mid-June. Nesting usually occurs on the pond levees or on nearby sun-exposed hillsides at the field station. The incubation period varies with the temperature and embryo stages at deposition and usually ranges from 62 to 90 days. Hatchlings can be found from late summer into early fall.

Adult males tend to be larger than adult females, and the anal opening is posterior to the carapacial rim, rather than under the rim as in females.

PAINTED TURTLE

Chrysemys picta (Schneider)

Identification

These are small turtles (adult CL usually 4-6 inches). The carapace of juveniles and adults is smooth, unkeeled, and olive to black in color. The edges of the carapace are tinged with reddish orange and the rear margin is not serrated. A prominent mid-dorsal reddish-orange stripe is distinctive. The plastron is orange or orange-yellow and may have vaguely outlined dark markings along the seams. The upper jaw has a median notch bordered on each side by tooth-like projections. Hatchlings resemble adults but have a median keel.

Similar Species

The smooth, unkeeled carapace and mid-dorsal stripe will separate juveniles and adults from all other UMFS species. The hatchling is keeled but resembles the adults in coloration and other features.

Taxonomic Comments

The subspecies at the UMFS is *Chrysemys picta dorsalis* Agassiz, the southern painted turtle.

General Comments

Painted turtles are common in the ponds at the UMFS. They are opportunistic feeders and will consume algae, aquatic plants, flatworms, oligochaete worms, mollusks, insects, spiders, crustaceans, fishes, amphibians, and carrion.

Courtship and mating may occur in the spring, summer, or early fall. Nesting takes place from mid-May into June. Females may not nest every year but will often lay two, three, or more clutches when they do. Clutch size varies from one to more than 20 eggs. Recently emerged hatchlings may be found from August into the late fall months, and some individuals overwinter within the nest.

Males are smaller than females and have elongated claws on the forelegs, and long, thick tails with the anal opening posterior to the margin of the carapace. Females do not have elongated claws, their tails are relatively shorter and thinner, and the anal opening is under the carapacial margin.



Painted Turtle

Edmund D. Keiser

FALSE MAP TURTLE

Graptemys pseudogeographica (Gray)

Identification

These are moderate-size turtles (adult CL usually 4-10 inches). The carapace is olive-brown with low, black-tipped, mid-dorsal carapacial keel projections. There are usually dull yellow markings on the costal scutes. The plastron is cream-colored, but some individuals have dark markings along the seams. The pupil of the eye is bordered by a white ring. A yellow, crescent-shaped mark borders the rear of the eye and excludes the other neck stripes from contacting the orbit. The rear of the carapace is serrate.

Similar Species

False map turtles are likely to be confused only with other species of the genus *Graptemys*, but no other species have been found at the UMFS.

Taxonomic Comments

The subspecies at the UMFS is *Graptemys pseudogeographica kobnii* (Baur), the Mississippi map turtle. This race is given species status as *Graptemys kobnii* by some authorities.



False Map Turtle

Edmund D. Keiser

General Comments

False map turtles are moderately common residents of the largest ponds at the UMFS. They are rarely found in small ponds and ditches and even then only as transients. These are shy, easily spooked, and difficult-to-trap turtles.

They usually feed on mollusks, which are not especially abundant at the field station. Individuals will also forage on annelids, insects, crustaceans, fish, carrion, algae, aquatic plants, and the fruits of terrestrial plants that fall into the water. Courtship and mating may occur in the spring, summer, or early fall. Nesting takes place from mid-May into June. Many females may lay two, three, or more clutches each season. Clutch size varies from two to more than 20 eggs. Hatching usually occurs in late July, August, or early September.

Females have larger shell sizes and wider heads than males. Males have elongated claws on the forelegs and long, thick tails with the anal opening posterior to the margin of the carapace. Females do not have elongated claws, their tails are relatively shorter and thinner, and the anal opening is under the carapacial margin.

EASTERN RIVER COOTER

Pseudemys concinna (LeConte)

Identification

These are moderate-size to large turtles (adult CL usually 9-16 inches). Head with five thin, yellow lines between the eyes and a bold yellow Y-shaped mark outlining the jaw angles. Carapace moderately serrate posteriorly and brownish with an extensive network of yellow-orange bars, circles, and curving lines. Second costal scute typically with a light C-shaped mark. Underside of chin flattened. Upper jaw with shallow, median notch but no tooth-like adjacent cusps. Plastron hingeless and yellow or yellow-orange with vague dark blotches anteriorly especially along the seams. Ventral surface of marginals with dark, often hollow, blotches.



Eastern River Cooter (adult)

Edmund D. Keiser

Similar Species

Juveniles and adults are similar to *Trachemys scripta* but may be distinguished from that species by the narrower postorbital yellow head stripe, the extensive network of light-colored carapacial circles and curving lines, the C-shaped light mark on the second costal, and the unmarked (usually) rear half of the plastron. Also, many UMFS *T. scripta* have reddish rather than yellow postorbital stripes.

Taxonomics Comments

No subspecies are recognized. Some UMFS turtles of this species have color patterns resembling those diagnostic for *Pseudemys floridana*, a species that is recognized by some authorities and not by others. Authorities recognizing *P. floridana* exclude Mississippi from the range. However, the diagnostic features presently utilized to define *P. floridana* also occur in numerous Mississippi (and UMFS) *P. concinna*. Indeed, it is not uncommon to find color patterns typical of both species on hatchlings emerging from the same nest.



Eastern River Cooter (juvenile)

Edmund D. Keiser

General Comments

Adult eastern river cooters are moderately common in the larger ponds at the UMFS. Juveniles may be found in smaller ponds. This species is thought to feed primarily on algae and aquatic plants, but individuals are known to forage on various invertebrates, fish, tadpoles, and carrion.

Courtship and mating occur in the spring. Nesting takes place from mid-May through June. Females may lay one or more clutches. Clutch size is typically between eight and 16 eggs, although larger clutches are known. Hatching usually occurs in late July, August, or early September.

Males have elongated, straight claws on the forelegs and long, thick tails with the anal opening posterior to the margin of the carapace. Females have higher domed shells and attain larger sizes. They do not have elongated claws. Their tails are relatively shorter and thinner, and the anal opening is under the carapacial margin.

EASTERN BOX TURTLE

Terrapene carolina (Linnaeus)

Identification

These are small (adult CL usually 4-7 inches), high-domed terrestrial reptiles. They have a single plastral hinge with moveable front and rear lobes and are the only UMFS turtles that can close their shell tightly. Coloration is extremely variable. The basic color is tan or brown. The scutes may be plain or variously patterned with blotches, spots, bars, or radiating lines. The carapace may have a low mid-dorsal keel. The plastron length equals or exceeds carapace length. The rear of the carapace is not serrate. The upper jaw is hooked anteriorly, and a notch is absent.



Eastern Box Turtle

Edmund D. Keiser

Similar Species

The high dome and ability to completely close the plastral lobes will separate juveniles and adults from other local species. Eastern mud turtles (*Kinosternon subrubrum*) can partially close their shells, but their skin and legs will usually be visible in gaps around the edges of the plastron. The hinge is not functional in hatchling box turtles, but these may be recognized by their brown carapace with a yellow spot in each scute and the cream plastron with a dark brown central blotch.

Taxonomic Comments

UMFS box turtles typically show the influence of one or both of two subspecies. These are the eastern box turtle, *Terrapene carolina carolina* (Linnaeus), and the three-toed box turtle, *T. c. triunguis* (Agassiz). An occasional individual will exhibit the flaring, upturned carapacial rear margin characteristic of the Gulf Coast box turtle, *T. c. major* (Agassiz).

General Comments

Eastern box turtles are common at the field station and are particularly conspicuous during the spring months. Although primarily terrestrial, these turtles will frequently move into the station's ponds, springs, and swamps and may even remain submerged overnight.

Hatchlings are primarily carnivorous, but omnivory increases with age. Flowers and fruits, fungi, invertebrates, small vertebrates, eggs, and carrion can be found in the diet. These turtles may feed on land or in the water. Courtship and mating occur primarily in the spring, but also during the summer and fall. Nesting takes place from May into July. Clutch size is typically four to five eggs. Hatching usually occurs in late July, August, or early September. Overwintering in the nest is known.

The irises of males are usually red, and those of females are yellow-brown. Males have longer, thicker tails than females, and the posterior lobe of the plastron is concave. Females have higher domed shells and flat posterior plastral lobes.

SLIDER

Trachemys scripta (Schoepff)

Identification

These are moderate to large (adult CL usually 5-12 inches) aquatic turtles. Most juveniles and adults have a wide red or yellow postorbital stripe and a vertical yellow bar on each costal scute. The hingeless plastron is yellow and usually has prominent black donut-shaped or solid blotches for much or all of its length. There is also a dark hollow or solid blotch on the underside of each marginal scute. The underside of the chin is rounded. The carapace is slightly keeled, and the posterior edge is moderately serrate. The yellow skin stripes between the hind limb and the tail are vertical. Adults darken with age, and old individuals may have most of their yellow markings obscured by dark pigment.



Slider (adult)

Edmund D. Keiser

Similar Species

Most juveniles and adults can be easily distinguished from eastern river cooters by their wider postorbital stripe, rounded chins, vertical yellow bars on each plural scute, and their more extensive and better-defined black blotches or donut-shaped markings on the plastron. Older melanistic adults may prove difficult to identify with certainty by persons inexperienced in turtle identification.



Slider (plastral view)

Edmund D. Keiser

Taxonomic Comments

Sliders of the UMFS appear to represent an intergrade population between *Trachemys scripta elegans* (Wied), the red-eared slider, and *T. s. scripta* (Schoepff), the yellowbelly slider.

General Comments

Sliders are easily the most conspicuous turtles at the field station. They may be found in all ponds, swamps, and ditches. Hatchlings are primarily carnivorous, but they become opportunistic omnivores as adults. Algae, aquatic plants, mollusks, annelids, arthropods, fish, amphibians, reptiles, and carrion can be found in the diet. Courtship and mating occur primarily in the spring and fall. Nesting usually takes place from mid-April into June. Clutch size varies from two to 20 or more eggs. Females may nest on more than one occasion each season. Hatching usually occurs in late July, August, or early September. Overwintering in the nest is known.

Adult males have longer, curved claws on the forelimbs and longer, thicker tails than females. The anal opening of the male is posterior to the rear of the carapace, while that of the female is under the carapacial rim.

COMMON MUSK TURTLE

Sternotherus odoratus (Latreille)

Identification

These are small (adult CL usually 2-4 1/2 inches) aquatic turtles. Most adults have two yellowish stripes on the side of the head, the dorsal one usually contacting the orbit. The carapace is deep dorsoventrally and relatively narrow. It is usually uniformly slate gray or dark brown but may sometimes have faint radiating black lines. The carapace is not serrate posteriorly. A keel is present in juveniles but typically absent in adults. The scales of the plastron are usually separated by skin, and a single gular scute is present. The pectoral scutes are not triangular. There is a single inconspicuous hinge. Paired fleshy barbels are present on the chin and throat.



Common Musk Turtle

Edmund D. Keiser

Similar Species

Juveniles and adults are most easily confused with the eastern mud turtle, but can be separated from that species by the presence of skin separating the plastral scutes, the single inconspicuous plastral hinge, and the quadrangular (not triangular) pectoral scutes.



Common Musk Turtle
(plastral view)

Edmund D. Keiser

Taxonomic Comments

No subspecies are recognized. Some authorities assign these turtles to the genus *Kinosternon*, but most, at present, do not.

General Comments

These turtles are locally termed "stinkpots" because of the musky substances they emit when handled. Common musk turtles are exceptionally abundant at the UMFS and probably occur within every pond, swamp, and water-filled ditch on site. They are omnivorous and rely on algae, aquatic plants, crustaceans, insects, eggs, fishes, amphibian larvae, and carrion for their diets. Courtship and mating primarily occur in the spring and fall months. Eggs may be deposited under or within mats of shoreline vegetation or in shallow excavations under logs,

boards, or brush piles. Usually two to five eggs are deposited. More than one female may utilize a nest site. Hatchlings emerge from late July through October.

Males can be recognized by long, thick tails (anus posterior to carapacial rim) that end in a blunt "nail" and conspicuous small patches of tilted scales on the inner surfaces of the hind legs. Females have thinner tails, the anal opening is under the carapacial rim, and the patches of tilted scales are not present.

EASTERN MUD TURTLE

Kinosternon subrubrum (Lacepede)

Identification

These are small (adult CL usually 3-4 inches) aquatic turtles. Adults may have two yellowish stripes on the side of the head, or the stripes may be broken up or absent. The dark head can be mottled with yellow, yellow-streaked, or uniform in color. The carapace is smooth, deep, and narrow. It is usually uniformly dark brown, olive-brown, or black and not serrate posteriorly. A keel is present in juveniles but usually absent in adults. The scales of the plastron are in contact and not separated by flesh. A single gular scute is present. The pectoral scutes are nearly triangular, and there are two conspicuous hinges. Paired fleshy barbels are on the chin. Hatchlings at the field station typically have three keels, and the plastron is mottled with black and orange.

Similar Species

Juveniles and adults are easily confused with the common musk turtle, but can be separated from that species by the plastral scutes being in full contact (no separating skin), the two plastral hinges, and the roughly triangular (not quadrangular) pectoral scutes.



Eastern Mud Turtle

Edmund D. Keiser

Taxonomic Comments

The ranges of *Kinosternon subrubrum subrubrum* (Lacepede), the eastern mud turtle, and *K. s. hippocrepis* Gray, the Mississippi mud turtle, overlap in Mississippi. Individuals encountered at the UMFS may have characteristics of one or both races.

General Comments

Eastern mud turtles are abundant at the UMFS and probably occur within every pond, swamp, and water-filled ditch on site. They are omnivorous and rely on algae, aquatic plants, mollusks, crustaceans, insects, spiders, annelids, eggs, amphibian larvae, and carrion for their diets. Courtship and mating typically occur in early to late spring. Two to four eggs may be deposited in a shallow nest or in depressions under cover objects during the spring and early summer months. Some females may nest more than once a year. More than one female may utilize a nest site. Hatchlings emerge from late July through October, and overwintering within a nest can occur.



Eastern Mud Turtle
(plastral view)

Edmund D. Keiser

The male can be recognized by a long, thick tail (anus posterior to carapacial rim) that ends in a blunt "nail," conspicuous small patches of tilted scales on the inner surfaces of the hind legs, a shorter plastron, and a larger head. Females have short tails, the anal opening is under the carapacial rim, the heads are smaller, and patches of tilted leg scales are not present.

SPINY SOFTSHELL

Apalone spinifera (LeSueur)

Identification

These are large (adult CL usually 6-17 inches) aquatic turtles. The shells are **smooth, leathery, and flattened, and bend easily around the edges.** Horny epidermal scutes are absent. The carapace is olive-brown and usually marked with scattered dark spots and solid or open vaguely outlined dark blotches. **One or two rows of low, spiny projections are present along the anterior margin.** The plastron is creamy-white. The snout is tubular, and the nostrils have a ridge-like projection on the median septum. Hatchlings resemble the adults.

Similar Species

Spiny softshells resemble no other turtles known from the field station. The similar smooth softshells, *Apalone mutica* (LeSueur), are known from Lafayette County but have not yet been recorded at the UMFS. The smooth softshell does not have spiny projections along the anterior edge of the carapace, and the ridgelike projection inside the nostrils is absent.



Spiny Softshell

Edmund D. Keiser

Taxonomic Comments

The ranges of the eastern spiny softshell, *Apalone spinifera spinifera* (LeSueur), and the Gulf Coast spiny softshell, *Apalone spinifera aspera* (Agassiz), overlap in northern Mississippi, and traits of either or both subspecies can be found in individuals at the UMFS.

General Comments

Eastern spiny softshells are abundant at the UMFS. They are most frequently encountered in the moderate-size to large ponds and in the peripheral swamps but may at times move into very small ponds and water-filled ditches. They are primarily carnivorous, feeding on mollusks, crustaceans, insects, spiders, annelids, fish, and carrion. Courtship and mating usually occur in early to late spring. Four to 30 or more eggs are deposited per clutch during May, June, and early July. A female will often nest twice during a season. Hatchlings emerge from late July through October, and a few may overwinter within a nest.

The males are smaller than females and can be recognized by their long, thick tails with the anus located near the tail tip. The females are about 1-1/2 times larger than males, and the tails are thin and short, and terminate under the margin of the carapace.

Recommended Sources on Turtles

Carr, Archie. 1952. *Handbook of turtles of the United States, Canada, and Baja California*. Comstock Publishing Associates, Cornell University Press, Ithaca, N.Y. 542 pp.

[*One of the best and most detailed books available on U.S. turtles. This classic has recently been re-issued by Cornell University Press.*]

Conant, Roger, and Joseph T. Collins. 1998. *A field guide to reptiles and amphibians. Eastern and Central North America*. Peterson Field Guides, Houghton Mifflin Co., Boston and New York. 616 pp.

[*This is an excellent, well-illustrated, field guide to the identification of U.S. turtles, other reptiles, and amphibians. It is available in most bookstores.*]

Ernst, Carl H., and Roger W. Barbour. 1972. *Turtles of the United States*. University Press of Kentucky, Lexington, Ky. 347 pp.

[*A good, easy-to-read, but older book on U.S. turtles.*]

Ernst, Carl H., Roger W. Barbour, and Jeffrey E. Lovich. 1994 (1995). *Turtles of the United States and Canada*. Smithsonian Institution Press, Washington, D.C. 578 pp.

[*This is the best and most recent source available on the identification, biology, and natural history of turtles of the United States.*]

Iverson, John B. 1992. *A revised checklist with distribution maps of the turtles of the world*. Green Nature Books, Homestead, Florida. 362 pp.

[*An excellent source on distribution of world turtles.*]

Powell, Robert, Joseph T. Collins, and Errol D. Hooper, Jr. 1998. *A key to amphibians and reptiles of the continental United States and Canada*. University of Kansas Press, Lawrence, Kansas. 131 pp.

[*This is one of the best identification keys available for the amphibians and reptiles of the U.S. and Canada. It is well-illustrated and easy-to-use.*]

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Glossary of Terms and Abbreviations

| | |
|--------------------|--|
| Adult | A turtle that is sexually mature. |
| Anterior | Toward the head end of the body. |
| Blotch | Usually an irregularly shaped darker marking within a region of lighter coloration. |
| Bridge | The part of the turtle shell that connects the carapace to the plastron. |
| Carapace | The dorsal unit of the turtle shell (Fig. 1). |
| CL | CL = carapace length. Distance along the mid-dorsal line typically measured from the nuchal scute to the notch between the pygal scutes. |
| Dorsal | Refers to the back region of a turtle. |
| Dorsum | The back of a turtle. |
| Ground color | The background color on which other color pattern features are superimposed. |
| Hatchling | The stage from hatching to closing of the umbilical (yolk sac/allantois) opening in the plastron. |
| Juvenile | A young posthatchling individual that has not reached sexual maturity. |
| Keel | A ridge-like elevation on a scute or the mid-dorsal ridge on the carapace. |
| Lateral | Toward the side. |
| Mid-dorsal | The middle of the back or dorsal region. |
| Mid-ventral | The middle of the belly or ventral region. |
| Ocellus | A concentric dark ring surrounding a light spot. |
| Plastron | The ventral part of the turtle shell (Fig. 2). |
| Posterior | Toward the rear of the body or tail. |
| Postorbital stripe | A stripe immediately posterior to the eye. |
| Scute | A large, relatively flat, horny, epidermal scale. Scutes typically cover the bones of the carapace, bridge, and plastron. |
| Serrate | Resembling the teeth of a saw. |
| Spot | A small, usually rounded dark or light color that contrasts with the ground color. |
| Tail length | Measured from the posterior edge of the cloaca to the tail tip. |
| TL | TL = total length. Measured from the end of the snout to the tip of the tail. |
| UMFS | Abbreviation for The University of Mississippi Field Station. |
| Supramarginals | A row of scutes between the costal and marginal scutes (Fig. 4). |
| Ventral | Refers to the belly or undersurface of a turtle. |
| Venter | The undersurface of a turtle. |

Appendix

THE TURTLES OF MISSISSIPPI

FAMILY CHELONIIDAE

| | |
|--------------------|--|
| Green Turtle | <i>Chelonia mydas</i> (Linnaeus) |
| Atlantic Hawksbill | <i>Eretmochelys imbricata imbricata</i> (Linnaeus) |
| Loggerhead | <i>Caretta caretta</i> (Linnaeus) |
| Atlantic Ridley | <i>Lepidochelys kempii</i> (Garman) |

FAMILY CHELYDRIDAE

| | |
|---------------------------|--|
| Alligator Snapping Turtle | <i>Macrochelys temminckii</i> (Harlan) |
| Common Snapping Turtle | <i>Chelydra serpentina serpentina</i> (Linnaeus) |

FAMILY DERMOCHELYIDAE

| | |
|-------------|--|
| Leatherback | <i>Dermochelys coriacea</i> (Vandelli) |
|-------------|--|

FAMILY EMYDIDAE

| | |
|----------------------------------|---|
| Southern Painted Turtle | <i>Chrysemys picta dorsalis</i> Agassiz |
| Eastern Chicken Turtle | <i>Deirochelys reticularia reticularia</i> (Latreille) |
| Western Chicken Turtle | <i>Deirochelys reticularia miaria</i> Schwartz |
| Yellow-blotched Map Turtle | <i>Graptemys flavimaculata</i> Cagle |
| Common Map Turtle | <i>Graptemys geographica</i> (LeSueur) |
| Pascagoula Map Turtle | <i>Graptemys gibbonsi</i> Lovich & McCoy |
| Black-knobbed Map Turtle | <i>Graptemys nigrinoda nigrinoda</i> Cagle |
| Delta Map Turtle | <i>Graptemys nigrinoda delticola</i> Folkerts & Mount |
| Ringed Map Turtle | <i>Graptemys oculifera</i> (Baur) |
| False Map Turtle | <i>Graptemys pseudogeographica pseudogeographica</i> (Gray) |
| Mississippi Map Turtle | <i>Graptemys pseudogeographica kohnii</i> (Baur) |
| Ouachita Map Turtle | <i>Graptemys ouachitensis ouachitensis</i> Cagle |
| Alabama Map Turtle | <i>Graptemys pulchra</i> Baur |
| Mississippi Diamondback Terrapin | <i>Malaclemys terrapin pileata</i> (Wied) |
| Eastern River Cooter | <i>Pseudemys concinna</i> (LeConte) |
| Florida Cooter | <i>Pseudemys floridana</i> (LeConte)* |
| Alabama Redbelly Turtle | <i>Pseudemys alabamensis</i> Baur |
| Eastern Box Turtle | <i>Terrapene carolina carolina</i> (Linnaeus) |
| Gulf Coast Box Turtle | <i>Terrapene carolina major</i> (Agassiz) |
| Three-toed Box Turtle | <i>Terrapene carolina triunguis</i> (Agassiz) |
| Yellowbelly Slider | <i>Trachemys scripta scripta</i> (Schoepff) |
| Red-eared Slider | <i>Trachemys scripta elegans</i> (Wied) |

FAMILY KINOSTERNIDAE

| | |
|------------------------|---|
| Razorback Musk Turtle | <i>Sternotherus carinatus</i> (Gray) |
| Stripeneck Musk Turtle | <i>Sternotherus minor peltifer</i> Smith & Glass |
| Common Musk Turtle | <i>Sternotherus odoratus</i> (Latreille) |
| Eastern Mud Turtle | <i>Kinosternon subrubrum subrubrum</i> (Lacepede) |
| Mississippi Mud Turtle | <i>Kinosternon subrubrum hippocrepis</i> Gray |

FAMILY TESTUDINIDAE

| | |
|-----------------|-------------------------------------|
| Gopher Tortoise | <i>Gopherus polyphemus</i> (Daudin) |
|-----------------|-------------------------------------|

FAMILY TRIONYCHIDAE

| | |
|-----------------------------|--|
| Midland Smooth Softshell | <i>Apalone mutica mutica</i> (LeSueur) |
| Gulf Coast Smooth Softshell | <i>Apalone mutica calvata</i> (Webb) |
| Eastern Spiny Softshell | <i>Apalone spinifera spinifera</i> (LeSueur) |
| Gulf Coast Spiny Softshell | <i>Apalone spinifera aspera</i> (Agassiz) |

**Pseudemys floridana* was placed in the synonymy of *Pseudemys concinna* by Seidel [1994. *Chelonian Conservation Biology* 1(2): 117-130]. Other authorities have continued to recognize *P. floridana* as a species. Ernst, Barbour, and Lovich (1994) and Conant and Collins (1998) are among those recognizing *P. floridana*, but their range maps exclude this species from Mississippi. The diagnostic features that distinguish *P. floridana* are evident in many Mississippi (and UIMFS) turtles currently considered by these authors to be *P. concinna*. Either the diagnostic features of *P. floridana* are invalid or both *P. floridana* and *P. concinna* occur throughout much of Mississippi.

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