

# THE FORKED TONGUE

THE MONTHLY NEWSLETTER OF THE GREATER CINCINNATI HERPETOLOGICAL SOCIETY

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## The Editor's Den

We really need articles. Thanks to Gordon Mitchell who sent the article on the Eastern Box turtle.

## Calendar of Events

June 9, 2007 – The GCHS has been asked to help in the Nerodeo at Lake Erie.

June 14, 2007 – (**Note that this is not the first Wednesday! It replaces the June 6<sup>th</sup> meeting**) Special Meeting featuring Joe Collins speaking on.

July 11, 2007 (**Note that this is not the first Wednesday!**) – Monthly Meeting featuring Will Bird and Phil Peak speaking on Snake conservation in Kentucky.

August 1, 2007 – Monthly Meeting featuring Dan Meakin, DVM, speaking on snake anatomy.

## **EASTERN BOX TURTLE**

By Gordon Mitchell

Most turtles that we observe are usually observed near water, such as those resting upon a log in a lake or in a pond. In Ohio and in other states, there is one common turtle species that is not readily found near water. That species is the Eastern Box Turtle (*Terrapene carolina carolina* L.).

The Eastern Box Turtle is a member of the *Testudines* Order, the *Cryptodira* Suborder, the *Emydidae* Family and of the *Emydinae* Subfamily. The generic name, *Terrapene*, is from an Algonquin Indian word for “turtle”. Both the specific epithet and the subspecies name, *carolina*, is named from the Carolina states, where it was first collected. Other common names for this species are the Box Turtle and the Common Box Turtle.

The Eastern Box Turtle has a long ancestry. Fossils of this genus go back to the Miocene Epoch (25-10 million years ago). Fossils of this species go back to the Pliocene Epoch (10-0.6 million years ago). Much of its present range goes back to the Pleistocene Epoch (600,000-12,000 years ago.)

## **Description of the Eastern Box Turtle**

**Size:** 4-8½ inches long.

**Shell:** Both the carapace (upper shell) and the plastron (lower shell) are made of bone, vascularized tissues, and keratin. They are hinged together by ligaments and not by bones. The shells are permanently attached to the turtle's body through its rib cage.

The patterns, markings, and colorations of both these shells vary and are caused by pigmented cells located upon the shells' scutes (plates). These colors are usually brown, black, tan, or olive, and are accompanied with red, orange, or yellow patterns of irregular or radiating bars, blotches, lines, patches, smudges, spots, streaks, or stripes.

**Carapace:** The carapace is both elongated and high-domed. The females' carapace is usually more highly domed than those of the males. The males' carapace is usually flared at its rear corners. Their scutes all have concentric growth rings. The carapace is topped with low distinct keels. These keels are usually located upon midline scutes. As the turtle ages, these keels usually wear down.

**Plastron:** The plastron is 2-lobed and is as long or is longer than the carapace. The rear lobe of the males' plastron is concave and the rear lobe of the females' plastron is either flat or convex.

The plastron is transversely hinged between its pectoral and its abdominal scutes. This hinge is composed of cartilage. This hinge allows the turtle to close both its lobes whenever the turtle wants to hide from predators. When closed, the plastron is held shut by strong sets of muscles. A tightly closed shell makes the turtle almost impregnable. Even a knife cannot easily penetrate this closed shell. Unfortunately, an overweight turtle may not be able to close its shell.

**Skin:** Its skin may also vary in colors, markings, and patterns. It can be black, bright orange, red-brown, or tan with red, orange, or yellow spots or streaks. Males may have lighter colors than the females.

**Neck:** Its neck is long. When the turtle closes itself within its shell, its neck is twisted inward into an “S” shape.

**The Next Meeting will be on Thursday, June 14<sup>th</sup> at 7:00 pm at the Cincinnati Nature Center**

**Tail:** The male's tails are longer, thicker, and wider than the females' tails.

**Hind Feet:** Their hind feet are strong and have 4 slightly webbed toes. The males' hind feet claws are longer, thicker, and more curved than the females' hind feet claws.

**Eyes:** The eyes almost always give away the turtle's sex. The male has pink or red eyes. The female has brown, gray, purple, or yellow eyes.

**Jaw:** Its upper jaw is small and is terminally hooked with an overhanging beak and with no notch.

**Habitats:** Their habitats are mainly terrestrial and vary with the seasons. These habitats may consist of fields, grasslands, meadows, pastures, or deciduous woodlands. Sometimes, they may be found in wetlands.

**Range:** The Eastern Box Turtle covers much of the U.S., east of the Mississippi River. However, its eastern range does exclude the upper Great Lakes, upper New England, Florida, and the Gulf Coast.

### Diet

The Eastern Box Turtle is omnivorous. They are both carnivores and herbivores. Their animal food consists of invertebrates, such as earthworms, insects, slugs, snails; small vertebrates, such as frogs, toads, salamanders, snakes; and carrion. Young turtles are usually more carnivorous than are the mature turtles. Their plant food consists of berries, buds, grasses, leaves, mushrooms, roots, and seeds. Some of their preferred foods are American Pokeweed (*Phytolacca americana* L.), Common Blackberry (*Rubus allegheniensis* Porter), Black Raspberry (*Rubus occidentalis* L.), Elderberry (*Sambucus canadensis* L.), Jack-in-the-pulpit (*Arisaema triphyllum* [L.] Schott), Mayapple (*Podophyllum peltatum* L.), Red Mulberry (*Morus rubra* L.), Strawberry (*Fragaria virginiana* Millspaugh), and Wild Black Cherry (*Prunus serotina* Ehrhart). Eastern Box Turtles will frequently raid vegetable gardens.

Because some plant's seed germination abilities improve after passing through an abrasive digestive tract, the Eastern Box Turtle aids in the reproduction and the distribution of many plants. Some of these plants may include the American Pokeweed, the Jack-in-the-pulpit, the Mayapple, and the Wild Black Cherry.

### Estivation

Eastern Box Turtles are diurnal. (However, if there are nearby bright lights, they may also be nocturnal.)

They are most active in the early morning, in the late afternoon or in the evening, on a cool day, or anytime after a rainfall.

During the mid-day heat, these turtles are usually inactive and stay hidden. They may hide under grass, leaves, brush piles, or rotted logs. If the weather is especially hot and dry, they will soak in either mud or water. While in water, they will rapidly lose any excessive body heat.

Like the aquatic turtles, Eastern Box Turtle can swim. Unlike the aquatic turtles, the Eastern Box Turtles are not very good swimmers.

### Hibernation

From October to April, or depending upon the latitude and the temperature, the Eastern Box Turtle will hibernate underground. In the Deep South, they may not hibernate at all.

When the night temperatures drop to the 40's, these turtles will seek out their hibernation dens. Before hibernating, they will burrow into loose soil, sand, mud, vegetation debris, or use abandoned mammal burrows. Some may dig shallow holes, leaving up to 1/3 of their carapace exposed. If the temperature is low enough, they will burrow deeper into the ground, sometimes to a depth of 2 feet. Some may even overwinter under water. Some turtles may use the same hibernaculum every year.

Eastern Box Turtles can tolerate cold temperatures. For periods of several days, over 1/2 of their body water may freeze. However, this turtle can die if it is bitterly cold and there is no snow for insulation. This turtle may also die if there is a severe late spring cold snap after it awakens.

### Territories

The Eastern Box Turtles are solitary and usually have their own territories. The size of their territories depends upon many factors. Simple factors may include accessibility to food, water, shelter, nesting sites, and mates. Other factors may also include physical barriers and rights-of ways. Their territories may cover about 2-40 acres or may extend within a radius of up to 1/2 mile. These individual territories may expand or contract. The females' territories are usually larger than the males' territories. Females may sometimes leave their territories to breed. Many of these individual territories overlap with territories of other members of this species. However, these turtles rarely fight over territories. If these turtles do fight, they will more likely fight with their more distant

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neighbors than with their closer neighbors. Their fighting usually consist or shoving and biting. These fights end when the loser withdraws into its shell or walks away.

Some turtles are transients and have no territory. They primarily roam to seek mates. These transient turtles are useful in maintaining genetic diversity amongst this species. There is no social dominance or hierarchy among these transients. If a turtle is moved from its territory, it can usually find its way back home. Eastern Box Turtles, especially the adults, have great homing abilities and can orient themselves by the sun, the moon, and the stars. If the sky is cloudy or moonless, they can still use earth's geomagnetic field. However, the farther the turtle is from its home territory, the lesser is its homing ability.

### **Reproduction**

From spring to fall, the Eastern Box Turtles will reproduce anytime during their active season. However, spring is their preferred season. During their breeding season, males may sometimes fight with other males over females. Before mating, the male may circle the female, bite at her shell's edges, and rotate, shove, or tip her with his front feet. This display of courtship usually lasts about 1 hour. If the female is not interested in the male, she will probably withdraw into her closed shell. After mating, the male may fall upon his back. Fortunately, most males are able to upright themselves. If the male cannot upright himself, he may die from overheating or from suffocation.

The female has the ability to store the males' spermatozoa within her oviduct for as long as 4 years. When the conditions are right, she will allow her eggs to be fertilized.

### **Nesting**

From May to July, the females dig their nests. The digging is usually done in the late afternoons or in the early evenings, often during a rainstorm. The rain loosens the soil and masks the turtle's odors.

Before building the nest, the female may first sniff out a suitable site. Such sites may be hayfields, lawns, roadsides, street foundations, and woodlands, usually located upon an elevated site of sandy or loamy soils. Using her front feet, the female digs her nesting cavity. These nesting cavities are flask-shaped and are about 3-4 inches deep. Digging them make take about 3-5 hours.

After digging, the female lays her eggs. These eggs

are usually laid at intervals of 1-6 minutes. Before and after laying her eggs, the female may soak herself in water. After the female lays her eggs, she buries them. After burying the eggs, she tamps down and smoothens out the dirt with her hind feet. When she is finished, she urinates upon the surface and leaves.

A single clutch varies from 1-11 eggs, usually about 4-6. Some of these eggs may be infertile. A female may lay up to 2-3 clutches per year. The incubation period for these eggs varies from 50-90 days. If the nest is warm, their incubation period is shorter.

These eggs are white, elliptical, elongated, or oval, about 1¼-1½ inch long, and about ½-¾ inch diameter. The shells are thin, flexible, and have a parchment-like texture. The outer layer of the shell is composed of aragonite crystals of calcium carbonate minerals and the inner layer is composed of fibrous layers of carbohydrates and proteins.

By fall, most of these eggs will have hatched. These young hatchlings will often over-winter within their nests. Midway through their embryonic development, the sexes of these hatchlings are determined by the outside temperatures. The higher temperatures produce more females and the lower temperatures produce more males.

### **Hatchlings**

These hatchlings are about 1-1/8 to 1-3/8 inches long. Their carapace is rounded, flat, brown to gray with a yellow spot on the center of each large scute, and has a medium dorsal keel. Its plastron is yellow or cream-colored with a brown central blotch. Their plastron's hinge is not yet functional. They usually grow about ½ inches per year. After the turtle reaches maturity, its growth rate slows. Depending upon the latitude, the hatchlings will reach maturity within 4-10 years, shorter in the South and longer in the North. After 10-15 years, most of these turtles are able to breed.

### **Predators**

Because of its ability to hide within its shell, a mature Eastern Box Turtle can easily protect itself from predators. Unfortunately, the eggs and hatchlings do not have that ability and are extremely vulnerable to predators. Fortunately, these hatchlings are able to produce a musky odor, which can be used to repel some predators.

Some of their predators consist of American Badgers (*Taxidea taxus* [Schreber]), American or Common Crows (*Corvus corax* L.), Muskrats (*Ondatra zibethica*

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[L.]), Raccoons (*Procyon lotor* [L.]), Striped Skunks (*Mephitis mephitis* [Schreber]), Gray Foxes (*Urocyon cinereoargenteus* [Schreber]), and Red Foxes (*Vulpes vulpes* [L.]). Other predators may include birds and snakes.

### Human Uses

Humans had many uses for the Eastern Box Turtle. Several Native American tribes, both historic and prehistoric, especially had uses for this species. Excavations of the prehistoric Native American mounds and villages had uncovered the shells of the Eastern Box Turtle. Many of these shells were buried with human remains. Some historic Native American tribes, such as the Cherokees, the Delawares and the Iroquois, had their own uses for this species. They used the empty shells as bowls, ceremonial rattles, jewelry, ladles, and ornaments. Many tribes also ate the meat, or used the turtle as medicine. Other tribes, such as the Wyandots, avoided this species because they associated it with witchcraft. In some areas, this turtle was over-harvested, almost to the point of extinction.

Although, the meat from the Eastern Box Turtle is edible, it is unwise to consume it. This turtles eats mushrooms that are toxic to humans but not to the turtles. Some of these toxins may accumulate within the turtle's flesh. In 1902, several striking coal miners in eastern Pennsylvania ate some poisoned Eastern Box Turtles and became very ill. A few recent studies have even been done on pesticide accumulation within these turtles.

### Threats

The biggest threat to the Eastern Box Turtle is man. Either intentionally or unintentionally, man has killed many turtles and has destroyed much of its habitat.

Although it is illegal to hunt or own a wild animal without a proper permit, many people will pick up an Eastern Box Turtle to keep as a pet. Some people illegally export these turtles to foreign countries. In many areas, this species has declined in numbers due to habitat destruction and fragmentation. Some of the turtles' greatest enemies are construction equipment, farm machinery, and lawn mowers.

Perhaps their greatest enemy of all is the automobile. More Eastern Box Turtles are killed on the highway than anywhere else.

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By Richard Headstrom

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By Joseph C. Mitchell

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**Classified Advertising Policy**

GCHS Members may run a free classified ad of 7 lines or less at no charge for an unlimited time; however, the ad will be canceled after one month unless the editor is informed to continue it. Please include scientific names for the animals with your ad as well as your phone number and area code.

Ads of up to 7 lines for non-member are \$2 per issue; ad charges for items more than 7 lines long are as follows:

Business card size	\$3 per issue
1/4 page	\$6 per issue
2 page	\$10 per issue
Full page	\$20 per issue

**The GCHS is not liable for the quality of the merchandise advertised. The Society also reserves the right to refuse any ad considered inappropriate.**

**Requirements for Submitting Articles to the Forked Tongue**

Articles can be submitted via 3.5" floppy disk or hard copy to Editor, GCHS 11470 Gatch Hill Road, Aurora, IN 47001.

Articles may be e-mailed to Grady Calhoun at [gradycalhoun@earthlink.net](mailto:gradycalhoun@earthlink.net).

Black and white photographs can be included with articles. Photo submissions should include your name, phone number, and description of photo on the back. Photos can be returned.

All time dependent submissions must be in the editor's possession no later than the meeting previous to the publication.

**Classifieds**

Rats and Mice for sale. Reasonable price. Call Jesse or Tom (513) 876-0579.

Discount: A 10% discount is offered to all card-carrying members of the GCHS at *All Creatures Animal Hospital*. Dr. Dan Meakin, All Creatures, 1894 Ohio Pike, Amelia, OH 45102, 513-797-7387.

Discount: A 10% discount is offered to all card carrying members of the GCHS at Dr. Dahlhausen's Veterinary Clinic, 5989 Meijer Dr., Suite 2, Milford, Ohio 513-576-0131

(Number to left of decimal indicates males; number to right of decimal indicates females; number to right of second decimal indicates number of unknown sex. For example, 3.2.1=3 males, 2 females, and 1 unsexed specimen)

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### Currently Held Positions

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### About the GCHS

The Greater Cincinnati Herpetological Society holds monthly meetings which typically consist of a short business section, a refreshment intermission, and a program related to herpetology. Both members and nonmembers are invited to attend. Membership is open to anyone with an interest in reptiles and amphibians. New members may sign up by mail or at the monthly meetings. Members receive monthly issues of *The Forked Tongue* and free classified advertising. Annual dues should be directed to the secretary at the society's mailing address, according to the rates below:

Student	\$10.00	Corresponding	
	\$10.00		
Individual	\$15.00	Sustaining	\$25.00
Family	\$20.00	Institutional	\$30.00
Contributing	\$50.00		

### Why Be a Member?

Receive monthly issues of *The Forked Tongue*

§Meet individuals knowledgeable about herpetoculture

§Have access to captive-bred herps and feeder animals

§Participate in society-sponsored field trips, and outings.

§Receive a 10 percent discount on herp-related items and services when you show a valid membership card at the following establishments:

Delhi Pet Center (513) 451-4015

Kentucky Reptile Zoo (606) 663-9160

Harrison Pet Center (513) 367-1115

All Creatures Animal Hospital (513) 797-7387

Dr. Dahlhausen's Veterinary Clinic (513) 576-0131.

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