

## Eastern Box Turtle

*Terrapene carolina carolina*

**Class:** Reptilia **Order:** Testudines **Family:** Emydidae

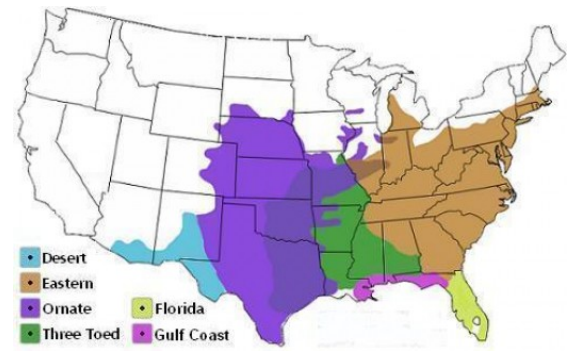
**Other Names:**

**Other subspecies:** There are approximately 6 recognized subspecies of box turtles-see subspecies list<sup>1</sup>

Eastern Box Turtle (*Terrapene carolina carolina*); Florida Box Turtle (*Terrapene carolina bauri*); Three-toed Box Turtle (*Terrapene carolina triunguis*); Gulf Coast Box Turtle (*Terrapene carolina major*); Mexican Box Turtle (*Terrapene carolina Mexicana*)\*; Yucatan Box Turtle (*Terrapene carolina yucatanana*\*)

\*Both the Mexican and Yucatan have also been listed as separate species, depending upon the publication

**Other Relatives:**



## Brandywine Zoo Turtle

'Tripod' 0.1 – female

DOH: 1998-1999 Aq: 11/10/2000

*About Tripod:*

Tripod suffered an injury to her back left leg and was brought into a wildlife rehabilitator. Though she's missing one leg, she gets around just fine. Tripod weighs typically between 4-15 oz., typically coming out of winter on the low end of her weight and building throughout the season. Tripod lives in the Sloth/Toucan exhibit.



'Mandrake' 0.1 – female

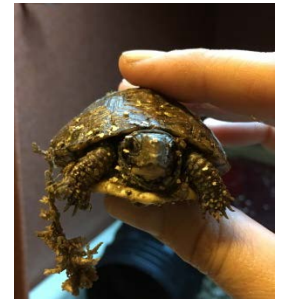
DOH: 2014 Aq: 08/11/2016

*About Mandrake:*

Mandrake came from a DE Wildlife rehabilitator. Mandrake is named for the plant mandrake AKA mayapple or maypop (*Podophyllum peltatum*), which box turtles are primary propagators for.



Mandrake plant



'Linneaus' 0.0.1 – unknown

DOH: 2015 Aq: 08/11/2016

*About Linneaus:*

Linneaus came from a DE Wildlife rehabilitator. Linneaus is named for Carl Linneaus, the father of modern taxonomy and binomial nomenclature.

**Status** Near threatened (2014)

## Geographic Region

Exclusively North American, box turtles are found in the eastern United States, ranging from southern Maine to Florida along the East Coast, and west to Michigan, Illinois, eastern Kansas, Oklahoma, and Texas.

## Habitat

Temperate forests to grasslands

## Characteristics

**Size:** 4.5 to 6 inches, but occasionally reach over 7 inches

**Longevity:** **Wild:** box turtles are known to live over 100 years; **Captivity:** often live much shorter lives.

## Physical Description

- All eastern box turtles have a bridgeless, hinged **plastron** (ventral part of shell/'belly') that allows box turtles to close their shells almost completely.
- They have a steep margined, keeled, high-domed, rounded **carapace** (dorsal part of shell/'back') with variable markings.
- Concentric growth furrows can be seen on the carapace, although in some older individuals they become very difficult to see due to wear/weathering. The upper jaw is slightly hooked.

Updated: 7/1/2017

- Eastern box turtles have 5 toes on each front leg, and normally 4 toes on each hind leg, although some individuals may possess 3 toes on each hind leg.
- The Eastern box turtle shell has the greatest variety and brightest colored patterns of all North American box turtles<sup>4</sup>

### Dimorphism

**Males:** males normally possess red eyes (irises) [Eye color is sometimes indicative but is not always reliable<sup>3</sup>] Males are often more colorful than females. In some isolated populations, males may have blue patches on their cheeks, throat, and front legs. Concave plastron.

**Females:** females usually display brown or yellow eyes and flat plastron.

### Diet: Omnivore

**Diet in the Wild:** They eats snails, insects, berries, fungi, slugs, worms, roots, flowers, fish, frogs, salamanders, snakes, birds, and eggs. Part of the box turtle's diet is poisonous mushrooms. These mushrooms don't hurt the turtles, but they can kill people! The toxins accumulate in the turtle's body and if you eat the turtle it can be deadly.<sup>4</sup>

**Diet in the Zoo:** reptile salad (squash, sweet potato, fruit, greens), canned & dry dog food. Fed 3X's a week.

### Behavior

- *Diurnal*, day active.

#### Environmental Adaptations

- Environmental temperature determines the activity rate of these turtles. Preferred body temperature is between 84 and 100 degrees Fahrenheit.
- In the heat of the summer, eastern box turtles largely restrict their activity to mornings and after rain. When it gets too hot, they hide under decaying logs and leaves, crawl into mammal burrows or in mud. When it is very hot, they go into shady pools and puddles to cool off.
- In the northern regions, they go into a period of dormancy called **brumation** in October or November, but further south, they remain active later in the year. To hibernate, they burrow as much as two feet deep into loose earth, mud, stream bottoms, old stump holes, or mammal burrows.

#### Defense Mechanisms

- When threatened, box turtles can 'close' their shell, thanks to the hinge in their plastron. This allows them to pull their head, tail, and legs safely inside their shells.

### Reproduction

- **Oviparous**, egg-laying
- The mating season begins in the spring and continues throughout summer to about October. Males may mate with more than one female or the same female several times over a period of several years.
- Box turtles usually have one clutch of 2-7 eggs per year<sup>3</sup>. Females can lay up to three clutches of from two to seven eggs, depending on the species.
- They can mate once and lay fertile eggs up to four years from that one mating. This helps to compensate for their inability to attract a mate.<sup>4</sup>
- The eggs typically incubate for 75 to 85 days at 75% to 85% humidity. Box turtles exhibit TSD (Temperature-dependent Sexual Determination). Eggs incubated at 71 ° F (22 ° C) produce males. Eggs incubated at 79 ° F (26 ° C) produce a mixed ratio of males and females and eggs incubated at 88 ° F (31 ° C) produce females.<sup>4</sup>

### Conservation

- **Use & Trade:** Commonly collected from the wild as pets, box turtles are now threatened in their home ranges.
- Although widespread and historically common, populations of the various subspecies of the Eastern Box Turtle are perceived to be in gradual decline across the species' range, documented both at a number of sites where populations were monitored over decades, and from casual observations across much of the range. Reported population densities range from two to 24 animals per hectare of suitable habitat<sup>1</sup>
- **Threats:** Box Turtles are in great demand for 'turtle races', and many animals are taken from the wild, raced, and if returned, often to another location, leading to stress, increased likelihood of vehicle strike, disturbance to established animals, and possible transmission of disease<sup>1</sup>.
- Degradation, fragmentation and destruction of Box Turtle habitat is widespread, from conversion of rural areas to suburban subdivisions and industrial areas, highways and other infrastructure, to consolidation of small-scale agriculture and timber plantations, and impacts of intentional or accidental vegetation fires, including prescribed burn regimes. Pollution and pesticide effects have been implicated in at least localized population declines, and this has impacted across much of the landscape.
- **Predators:** Predators include raccoons, foxes and other medium-sized animals.

### Did You Know?/Fun Facts

- EBTs are important seed dispersers for "Mayapples" (or "maypops" or "mandrake"- *Podophyllum peltatum*) the small, umbrella-like plants that are commonly found in woodlands of DE in the spring.
- Home ranges for box turtles average the size of one football field for their entire lives.
- EBTs have an internal homing ability, which is why if they're removed from their home range, they will attempt to return to it, often having to cross hazards such as roads.
- Box turtles can be dangerous to eat. At times they consume poisonous mushrooms and the toxins may linger in their flesh.

**Glossary:** List of definitions of the most important recurrent technical terms used in the text.

**Brumation-** a period of dormancy and low metabolic activity in reptiles that is similar to hibernation. During this time, metabolic and digestive systems slow or completely stop.

**Carapace-** the dorsal (back), convex part of the shell structure of a turtle, consisting of the animal's ribcage and spine combined with superficial bony plates called scutes.

**Oviparous-** refers to animals that lay eggs, with little or no other embryonic development within the mother.

**Plastron-** the nearly flat part of the shell structure of a turtle, what one would call the belly or ventral surface of the shell.

### References

- 1 IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. <[www.iucnredlist.org](http://www.iucnredlist.org)>. 2009, December.
- 2 Niedzielski, S. 2002. "Terrapene carolina" (On-line), Animal Diversity Web. Accessed December 03, 2009 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Terrapene\\_carolina.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Terrapene_carolina.html).
- 3 [http://www.virginiaherpetologicalsociety.com/reptiles/turtles/eastern-box-turtle/eastern\\_box\\_turtle.php](http://www.virginiaherpetologicalsociety.com/reptiles/turtles/eastern-box-turtle/eastern_box_turtle.php)
- 4 <http://tsadjatko.hubpages.com/hub/What-you-should-know-about-Eastern-Box-Turtles>