



Species Spotlight

Woodland Box Turtle

Terrapene carolina carolina

Go with what works. That may as well be the motto of turtles. For they have went, albeit in their case - very slowly went, with the same basic body plan for over 200 million years. A fossilized Triassic era turtle is just as recognizable as any today. The diminutive woodland box turtles (about 6 inches long and weighing roughly a pound) have slightly improved upon the basic shell design however, elevating it to the level of its own mobile, near impenetrable fortress.

Thinking Inside the Box.

Box turtles are so named because they can not only retreat into their shells at the first sign of danger, but mostly seal off their legs and head within a hinged plastron (under shell) creating a formidable armor that few predators attempt to breach. The yellow/orange blotched upper shell, or carapace, consists of a combination of rib bones and scales. Turtles are the only known vertebrates, extant or extinct, to accomplish the feat of moving their shoulder, collar, and neck bones to within their rib cage which has allowed for the evolution of their protective shell.

Much like fingerprints, every turtle has unique orangy yellow head and shell markings. The effect helps them blend in with a sun-dappled forest floor. Males often have red eyes and concave plastron, and females have brown eyes and a flat plastron.

Old-age Prudent Virginia Turtles

Like most turtle species, box turtles can be very long lived. A century or more is not unheard of. Being a cold-blooded reptile, they are also not ones to make rash decisions. Their heroic half shell turtle power speed red lines at 0.25 mph, so every step is calculated and deliberate. Traveling at such speeds, it's no surprise that their home range is usually less than 2 acres, and some spend their entire lives within it.

They are usually near a pond, woodland. Box turtles

meadow, and/or can be found from the extreme tip of southeastern Maine, west to the Great Lakes region and south (by way of Virginia) to Texas and far northern Florida.

As they grow from hatchlings to adults, box turtle diets grow along with them. As juveniles they are mostly carnivorous and focus on slugs, worms, insects, and larvae.

This diet makes sense when you consider hatchlings and juveniles spend a lot of their time in or near ponds and streams. Adults more often feed on land with a varied diet that includes berries, seeds, roots, flowers, fish, eggs, amphibians, and even poisonous mushrooms. In fact, if predators needed another reason to not attempt to gnaw through the tough shell of an adult turtle, it would be that the meal they get could be poisonous and actually kill them. Eating poisonous toadstools can make turtle flesh poisonous.

Terrapin Station

The scientific name of *Terrapene* derives from an Algonquian Native American word meaning "turtle." Many Native American tribes revere and respect turtles. Iroquois and Lenape creation stories say the Great Spirit created their homeland by building up earth on the back of a giant turtle, and some still refer to North America as "Turtle Island." Plains tribes associate turtles with such pleasant traits as long life, protection, fertility, healing, and wisdom.

But I Regress, Infinitely

Tangentially related to the Native American legend is the philosophically paradoxical expression "It's turtles all the way down", which refers to the concept of infinite regress. In other words, the idea that any explanation will always require a further explanation, *ad infinitum*. This is a problem that inevitably arises when trying to explain the origins and nature of the universe, and can be illustrated in the imagined discussion between two philosophers of antiquity as such. Leonidas: If Atlas holds up the world, what holds up Atlas? Erastus: Atlas stands on the back of a turtle. Leonidas: But what does the turtle stand on? Erastus: Another turtle of course. Leonidas: And what does *that* turtle stand on? Erastus: My dear Leonidas, it's turtles all the way down!

Brumation Brain Freeze

Box turtles operate best on early summer mornings, evenings, or after a cooling rain. If it gets too hot, they'll seek protection under logs or leaves, burrow into moist soil, or chill out in a pond or stream. Come October, in the northern parts of their range, they enter a form of torpor that can last until April. Unlike warm-blooded animals that hibernate, cold-blooded animals "brumate" during the winter months. Using their clawed feet, box turtles burrow down into sand or soil before it has frozen, to create an overwintering chamber where they can hunker down for winter. Preferably, it is dug on a south or west-facing slope so as to maximize sunlight

A Male Eastern Box Turtle
Richard Coldiron photo





Left to right: Box turtles all have unique shell and head patterns. | Their hinged plastron can help to seal themselves inside their protective shell. | Once the female lays her eggs in a shallow nest, the offspring are on their own.

exposure and moderate temperatures. Upon entering their hibernaculum, they fall into a state of sluggish torpor, greatly slowing their metabolism and living off stored fat reserves. If they get caught above ground during a quick cold-snap before they have entered a den, no problem. Amazingly, box turtles can survive the icing of internal organs for short durations (not more than 50 consecutive hours) and are the largest freeze tolerant vertebrate in the world. If the temperature drops to less than 17°F, bodily fluids freeze and ice can surround their lungs, muscles, and even brain. Up to 58% of the water in a box turtle can freeze with no long-term ill effects. When this happens blood is concentrated centrally, and the liver produces extra glucose that is sent to protect vital organs like the heart, eyes, and brain. In extreme cold, its heart can stop completely. Hopefully, the sun warms them up soon enough to be able to recover and enter a den. The whole brumation process is important for box turtle health and also helps regulate hormones needed for reproduction.

Living Life Unhinged

Breeding season for box turtles essentially starts as soon as they emerge from their overwintering shelters in April. Though they reach breeding age by their 5th year, most box turtles don't begin breeding until age 10. Males hope to mate every year, but females have the ability to store sperm and can lay fertile eggs for up to 4 years without mating again. By May or June, females will venture from only a few feet to a mile or more within her home range to find a suitable nest location. Using her hind legs, she'll dig the nest in sandy soil and lay several eggs (often 4 or 5 but up to 11), then shallowly cover them with sand or soil. After being laid, the eggs must incubate and hatch all on their own as the adults have finished with their parental obligations. Box turtles are a species that have temperature dependent sex determination. Females are most likely at egg incubation temperatures above 82°F, and males between 72°F and 81°F.

If found, eggs are a prized meal for many animals and nests are frequently raided by skunks, crows, foxes, snakes, and raccoons. Eggs that make it through hatch about 2 months after being laid. This is also a dangerous time. Young box

turtles can't hide away in their hard shells for many years. Hatchling shells are not only soft, but the hinged plastron doesn't develop until their 4th year of life. In fact box turtles continue to grow for 6 or 7 years, only after which time their shell completely hardens. Adults have the ability to quickly regenerate/repair their shells, even if severely damaged.

Tough Times for Terrapene Turtles

Although they are still common in some areas, woodland box turtle numbers have steeply declined over much of their range, and they are rare at their northeastern limit. The same animals mentioned earlier that are apt to dig up nests and prey on hatchlings do very well around humans and our trash. Several states (NY, MA, and CT) list it as a species of special concern or equivalent. Maine and NH list them as state endangered. Habitat loss and fragmentation, vehicle strikes, climate change, and illegal collection all threaten the future of this little turtle.

How You Can Help

There are many ways we can help out box turtles. The most simple is to leave them in the wild - never take one for a pet. For a later breeding, long-lived species like box turtles, it doesn't take losing many turtles to greatly reduce their ability to maintain their population.

Crossing roads is a dangerous endeavor for turtles. When seen on a road in June or July, they are likely pregnant females venturing off to find a nesting site. If it can be done so safely, you can move the turtle off the road, but make sure it's in the direction it was headed.

If you live in box turtle territory and are able to, you can make your yard more turtle friendly. Adding habitat features like brush piles, native fruiting shrubs and bushes, and a ground-level water source will provide food and shelter for turtles, as well as many other species of birds and wildlife. Also take care when mowing tall grass fields and pastures as turtles like to shelter in them.

For more

- [Become a Box Turtle Citizen Scientist](#)- Help with the Eastern Illinois University project by uploading your photos of box turtles.