

## Turtles: Thinking Outside the Box

The eastern box turtle (*Terrapene carolina carolina*) is the only terrestrial turtle found in North Carolina and is North Carolina's state reptile. It is also the longest-lived vertebrate in North America, with some individuals recorded to be over 100 years old!



Eastern box turtle  
(*Terrapene carolina carolina*)

### Box Turtle Adaptations



Eastern box turtle completely withdrawn in its shell.

Eastern box turtles have features and behaviors that enable them to live and thrive in their environment. These characteristics are known as adaptations. The most important adaptation a box turtle has is its shell, which is composed of bone and makes up a large part of its skeletal system. Bony plates on the turtle's shell, known as **scutes**, are made of keratin, the same type of protein that makes up our hair, skin, and nails. These scutes cover the **carapace** and the **plastron**. The turtle's ribs and **vertebrae** are **fused** to the inside of the carapace, so the turtle cannot

leave its shell like a hermit crab would do as it grows. Instead, the shell grows with the turtle, protecting the turtle's internal organs and providing a thick cover to keep it safe from predators. Additionally, box turtles have a hinge on their plastron that enables them to close entirely in their shell if they feel threatened. Box turtles' shells are also colored with a mixture of brown, yellow, and orange, colors that help them camouflage with the forest floor.

In addition to their shell, box turtles depend on their eyesight for survival. Box turtles have great eyesight for recognizing food, surroundings, and potential danger. Not only can they tell the difference between ripe and unripe fruit, but they can also identify other individual box turtles based on the colors and patterns on their shells and bodies. Lastly, box turtles can digest a variety of foods including moss, berries, worms, insects, frogs, and birds. They can even eat mushrooms that are toxic to humans!



Box turtles have excellent sight.

## Habitat Needs

Eastern box turtles are found across North Carolina in a wide variety of habitats including forests, forest edges, meadows, and rural or suburban backyards. Depending on the habitat quality, eastern box turtles can have a home range between 2 and 13 **acres**. If their habitat provides enough food, water, shelter, and occasional contact with other box turtles, they have all they need and rarely leave their home range. Box turtles will always go back to where they are most familiar with their surroundings this adaptation called **homing behavior**.



Eastern box turtle eating a mushroom.



Female digging

During hot weather, eastern box turtles can be found cooling off in shallow aquatic habitats such as swamps and bogs or even large puddles after heavy rain events. In the winter months, eastern box turtles go through **brumation**, which is like hibernation in mammals. Like other reptiles, box turtles rely on their environment to **regulate** their body temperature. When colder weather arrives, box turtles will seek a warm sheltering spot like a stump hole, rock crevice, or burrow and go into an inactive phase to conserve energy.

They will stay there until spring when temperatures increase. When weather and seasons change box turtles use different behaviors to adapt to the changes in their habitat.

## Turtle Tracking

There is still a lot to be learned about eastern box turtles, especially about the population or numbers across North Carolina. Are they **vulnerable** or **endangered**? Are populations higher in certain areas of the state than others? What factors affect box turtle populations? One way to find answers to these questions is



Haw River State Park tracks some turtles by attaching a radio transmitter (pictured here) to their carapace,

to track turtles over time. A project called Box Turtle Connection (BTC) is working on finding answers using various sites, including Haw River State Park. When an eastern box turtle is found, data is collected on the turtle, such as its weight, health, and where it was located. Before being released back where it was found, project leaders permanently mark the turtle so that if it happens to be located again, it can be easily identified as having already been recorded. With data collected from this study, we can learn more about eastern box turtle populations, their habitat preferences, and differences across the state so we can determine how to protect their populations.

### Conservation- What can you do?



Eastern box turtle populations are declining in many areas. As landscapes change and habitats become more **fragmented** with roadways and buildings, eastern box turtles have a difficult time traveling safely in their home ranges. Box turtles are also highly sought after in the pet trade industry. Fortunately, there are steps being taken to protect box turtles. For instance, it is unlawful in North Carolina to take eastern box turtles

from the wild. Laws regulate the purchase and sale of eastern box turtles as well as other reptiles.

So, what can you do to help box turtles? Share information about the eastern box turtle with family and friends! Also, if you happen to see a box turtle crossing the road, don't take it home with you. Keep the turtle wild! Only help a turtle cross the road if you can do it safely with adult supervision, and make sure to put the turtle on the side of the road it was heading toward.

