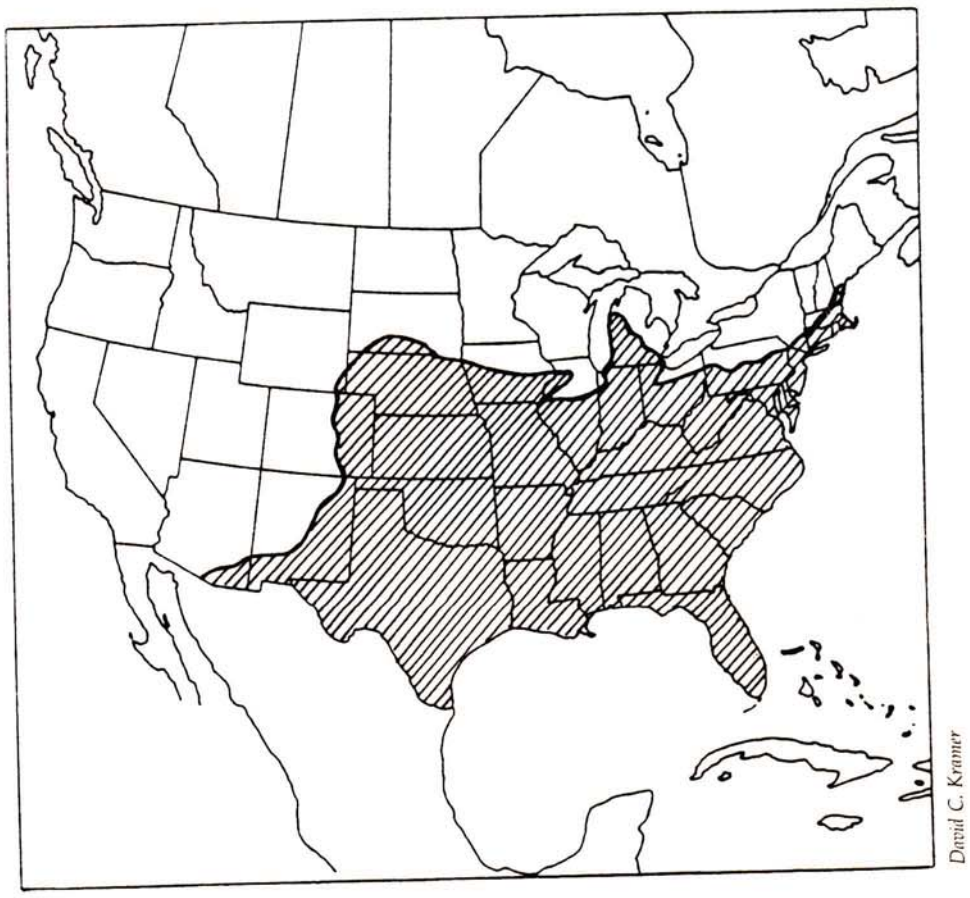
The Classroom Animal

Box Turtles

There are several kinds of box turtles in the United States. They differ only slightly in appearance, but because they occupy different habitats, they have different environmental needs and food preferences. Box turtles are found throughout the eastern and central United States, from southern Maine westward to South Dakota, then southward to Arizona. (See map.)



David C. Kramer

In the U.S., box turtles live in the areas shaded.

Appearance

The box turtle is renowned, and appropriately named, for its ability to pull in its head, feet, and tail and close its shell for protection. This feat can be accomplished because the turtle's high, dome-shaped *carapace* (upper shell) provides room for its appendages, and because the *plastron* (lower shell) is hinged, allowing the two halves to be pulled upward and held tightly closed. This shell makes the box turtle the best protected of all North American turtles.

In turtles, there is an apparent relationship between the degree of protection afforded by the shell and the relative aggressiveness of the species. The snapping turtle, for example, has a reduced plastron and consequently less protection from its shell, but this is more than made up for by its aggressiveness. Conversely, the complete protection afforded the box turtle by its shell is reflected in its retiring and docile nature.

The box turtle, like the giant tortoise it resembles, is adapted for a terrestrial rather than an aquatic envorinment. The shape of the carapace and the degree of protection it provides, the short, stumpy legs and small feet, and the lack of webbing between the toes are all terrestrial adaptations. The toes are equipped with strong claws for digging in the soil.

The box turtle's shell is usually black or brown, overlaid with yellow to orange spots or streaks. However, the markings are highly variable. Occasional specimens display few or no markings, while in others the lighter colors are so profuse that the shell appears to be yellow or orange with irregular dark markings. Markings on the head, neck, and legs are equally variable.

The eyes of the young box turtle are normally brown, but in mature males they are often red. Females rarely have red eyes. This fact is useful in determining the gender of a specimen, but by itself it is not totally reliable. Another sexual difference, although also variable, is that the rear lobe of the plastron is slightly concave in males to allow closer contact during mating. These two characteristics taken together generally make it possible to determine gender.

Habitat

River bottoms, moist forests, and woodlands are typical habitats for the Eastern box turtle. Western species are more tolerant of dry conditions and more likely to be found in open areas. Box turtles are active throughout the warm months but are most conspicuous during the spring and fall as they wander about in search of food. In the summer, they avoid the midday heat by limiting their activity to the morning and evening hours. During extended dry periods, they bury themselves in moist soil or mud or soak in shallow water, sometimes for days at a time. In

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the cool days of fall, they bury themselves in soft soil or enter the burrows of other animals where they hibernate until spring.

Reproduction

Box turtles typically mate in the spring soon after they emerge from hibernation. Then, in June or July, the female lays from three to eight leathery-shelled eggs in a nest she excavates in the soil. Under favorable circumstances, the eggs will hatch in two to three months, just in time for the hatchlings to enter hibernation. The young turtles usually go into hibernation without feeding, so they grow very little until the following year. Juvenile box turtles are so secretive that little is known of their early growth and activity. However, they appear to grow slowly, reaching sexual maturity and a length of 7.5 cm in about 5 years, 10 cm in 12 to 15 years, and 12.5 cm in about 20 years. Later growth is very slow, but box turtles continue to grow as long as they live. Box turtles commonly reach 60 years of age, and some may live for over 100 years.

In The Classroom Animal, a development of S&C's popular Care and Maintenance series, column writer David C. Kramer focuses on the natural history of small animals suitable for short-term classroom study and on how to care for these animals. Readers wishing to communicate with Professor Kramer should write him at the Department of Biology, St. Cloud University, St. Cloud, Minnesota 56301.

Diet

The box turtle eats a wide variety of plant and animal materials, but it is an opportunistic feeder and generally consumes whatever is available. Unlike most aquatic turtles, the box turtle does not insist that its animal food be living.

Defense Reaction

When a box turtle is encountered in the wild, its first line of defense is to withdraw into and close its shell. Any attempt to encourage a turtle to open up by prodding will be futile. The only way to get one to come out is to leave it undisturbed for several minutes. It will then follow a predictable pattern of behavior and come out in its own time—turtle time, which is slow. First, the shell opens slightly and the turtle peeks out. If its surroundings look safe, it opens the shell wider and pokes out its head. After another careful look around, it opens still wider and slowly extends its feet. Finally, if there is no disturbance, the turtle will wander off and go about its normal activity.

Emerging from the shell might take a turtle 15 to 30 minutes. If there is any disturbance, however, it retreats into its shell, and the entire procedure starts again. Most turtles lose this strong protective reaction after a short time in captivity and will withdraw only when strongly provoked.

The Classroom Turtle

Box turtles adjust nicely to captivity. Their short-term needs are simple and easy to supply. They are more active and alert than most other turtles and seem relatively more intelligent. For these reasons, they make interesting captives and are more commonly kept as pets than any other turtle.

Some turtles, however, are protected in some states. If there is any question about the legality of keeping a box turtle, check with a local conservation officer to be sure.

Box turtles, like other turtles (and most other vertebrate animals), can carry *Salmonella* bacteria, which causes salmonellosis in humans. Check out local health regulations before you decide to keep a turtle in school. And be sure to have students wash their hands carefully after handling or feeding the classroom turtle or cleaning its cage.

Housing and Care

A medium to large aquarium is an ideal enclosure because of the visibility it gives, but a wooden box or a child's plastic wading pool is also suitable. If the container is as much as three times the height of the turtle, no cover is

needed. Otherwise, a screen cover should be provided. The interior appointments of the enclosure should include a water container larger than the turtle's body and a few centimeters of soil. The container will serve as a source of drinking water and also as a place for the turtle to soak itself. If the water container is more than 5 cm deep, put some rocks or gravel in its bottom to assist the turtle in climbing out. Then fill the outside enclosure with soil to about the top of the water container. The soil will provide a comfortable substrate and a medium in which the turtle can bury itself.

Diet and Feeding

Captive box turtles should be offered food resembling their natural diet. Most specimens will readily accept mealworms, crickets, and earthworms, all of which are easy to collect, raise in the classroom, or purchase locally. As a substitute for live animal foods, offer small (insect-size) strips of lean raw meat or hamburger. Some specimens will also learn to accept canned dog or cat food. To round out the diet, offer a variety of vegetables, including lettuce, and fruits, such as apple, cantaloupe, banana, and an occasional strawberry.

The food preference and the amounts consumed will vary, so do not be alarmed if some of these items are not accepted, or if the turtle does not seem to be hungry. A box turtle may not choose to eat at regular intervals, but infrequent meals will meet its needs as long as a sufficient quantity of food is kept available. The key to success in keeping a box turtle is to offer it a variety of foods and let it select its own diet. If a specimen has not eaten after two or three weeks, however, it should be released at the point of capture.

Long-Term Captivity

If a box turtle is being kept over the winter, it might bury itself in the soil and remain inactive for as long as eight weeks, if it is not disturbed. There are two reasons for this. First, the turtle's biological clock is probably telling it that it is time to hibernate. Second, the short days and cool nights (and weekends, if the heat is turned down in the school) tend to reinforce its biological clock. Since a classroom is not cool enough for hibernation through the entire winter, the turtle should not be allowed to remain inactive for more than a month.

To encourage the turtle to surface, suspend a light bulb near one end of the cage and adjust its height to produce a constant temperature of 25-30°C. The constant warmth and light will reduce the turtle's desire to hibernate and stimulate it to eat.

Since keeping a turtle over the winter offers these special problems, it is probably in the best interest of both keeper and captive to release the turtle before cold weather starts, either at the point of capture or in some other suitable habitat.

An Omission

In the November/December 1985 S&C, the photographs of crickets that appeared in The Classroom Animal should have been credited to Paul E. Meyers.

Resources

Conant, Roger. (1975). *A guide to reptiles and amphibians of Eastern and Central North America.* Boston: Houghton Mifflin.

Ernst, Carl H., and Barbour, Roger W. (1973). *Turtles of the United States.* Lexington: University of Kentucky Press.

Oliver, James A. (1955). *The natural history of North American amphibians and reptiles.* Princeton: Van Nostrand.