

Box Turtles

CARE IN CAPTIVITY

NATURAL HISTORY

There are four North American species currently available in the pet trade: the eastern box turtle (*Terrapene carolina carolina*), the three-toed box turtle (*T. c. triunguis*), the Gulf Coast box turtle (*T. c. major*) and the ornate box turtle (*T. C. ornata*). A Chinese box turtle, *Cuora flavomarginata*, and a Malayan (Amboina) box turtle (*C. amboinensis*) are currently being imported for the pet trade. All of these box turtles, unless specifically documented to the contrary by the pet store, have been caught in the wild. (Box turtles often have small round holes in their shell from the pincers used to collect them.) American Box turtles are partially aquatic turtles: unlike aquatic turtles such as the red-eared sliders, painted turtles and other fresh and brackish water turtles, the *Terrapene* spp. spend the greater part of their time on dry land within easy range of shallow fresh water. The Chinese and Malayan box turtles (*Cuora* sp.) are more aquatic than the American box turtles.

The American box turtles are widespread throughout the eastern, central and southwestern U.S. and on into the northern parts of Mexico. Box turtles fall somewhere between the aquatic water turtles and tortoises in their need for access to a body of water and to woody grassland areas with dry sandy soil on top, humid earth beneath. Box turtles forage for food, primarily plant matter, on land and spend much of their sleep time dug into burrows or wedged under fallen trees or rocks, safe from predators. They do, however, require plenty of fresh shallow water (one quarter to one third their shell height); while they are not as adept at swimming and diving as the water turtles, they can paddle around. While this water time is generally used for rehydration and voiding body wastes, some are known to do a bit of foraging of aquatic plants and invertebrates at that time. Omnivorous when young, adults eat mostly vegetation.

As with all wild-caught reptiles, the animals found in pet stores have been under stress for some time. As a result, they are most likely suffering from protozoan and bacterial infections, including *Salmonella* which is easily transmitted to young children. Additionally, they are usually emaciated and dehydrated due to long periods of time without food or water or being held in areas too cold to stimulate the appetite; many of these turtles will not eat when they are stressed or frightened, and cannot eat when they are too cold. As soon as you can after you take your turtle home, scoop up a fresh fecal sample and take it and your turtle to a reptile veterinarian. (If your turtle is not eating, get it to the veterinarian as soon as possible to check for emaciation and dehydration.) While the feces is being tested, the vet will check out your turtle for signs of nutritional deficiencies, topical bacterial or fungal infections, beak overgrowth, respiratory and eye infections - all very common in wild-caught animals (and in captive turtles who have not been provided with the proper environment or diet). Make sure your turtle is given all the medication prescribed by the vet. If you have trouble administering it yourself, take your turtle back to the vet to have it done. If maintained at the proper temperatures, fed a healthy varied diet and kept in a stress-free active environment, your turtle may outlive you: some individuals have lived more than 100 years.

Due to the health problems associated with small children putting small turtles in their mouths, it is illegal for pet stores to sell turtles smaller than 4" (carapace

length). While hatchling turtles are about 1 1/4", many are full grown when they reach anywhere from 6" (ornate, three-toed) to 8" (eastern, Gulf Coast, Chinese, Malayan). Males have thicker, and generally longer, tails than the females. Males are larger overall and may be more colorful than females. Male *T. carolina* have concave plastrons (bottom shells). Depending upon their environment and diet, box turtles will reach full size within 4-6 years, and sexual maturity at four years for males, 5-7 years for females.

All turtles require a two-three month hibernation period at temperatures around 50-65oF.

SELECTING A HEALTHY TURTLE

The time to buy a turtle is not during the fall, winter and early spring when the turtle should be in hibernation. Turtles found in pet stores during this time are likely to be more stressed and suffering from dehydration and starvation than pet trade turtles found during the spring and summer. (If you wish to buy a turtle (or tortoise) during this time, seek out captive breeders or owners who are selling their own, well-established, animals.) When you pick the turtle up (supporting its body in your hands), it should feel like a weighty, solid turtle - not like a light-weight empty shell. A gentle tug on a back leg should cause the turtle to strongly pull the leg away. There should be no swellings about the face or limbs; eyes should be open, clear, alert. The shell should be firm all over with no slimy or discolored patches. The nose and mouth should be clear - no bubbly secretions, and no clicking sound discernible when the turtle breathes. The beak should be even, free of breaks or overgrowths.

CREATING THE PROPER ENVIRONMENT

Outdoor enclosures are preferable for all chelonians when the weather is right. As for indoor enclosures:

Indoor enclosures must be at least 36" x 12", or about the size of a shallow 40 gallon tank. Wood enclosures of the same dimensions and high enough so the turtle can't climb out may be built. The insides of such wooden enclosures must be waterproofed with several coats of epoxy or non-toxic based polyurethane, and left to cure for several weeks.

Create the land area using 2-3 inches of good quality plain sterile potting soil slightly moistened. Do not use backyard dirt or soil from a garden, and there should be no perlite or vermiculite mixed into the soil. Mix the soil with finely shredded orchid bark. You may also use plain fir or orchid bark, or deep drifts of alfalfa. Do not use coarse substrates such as sand, gravel or rock which can scratch the shell, opening the way to bacterial infections. Your turtle requires a shelter or hide box filled with additional substrate material, or drifts of fresh alfalfa hay, in which to burrow. This can be made out of wood, cork bark slabs or even a cardboard box with a doorway cut into it.

A water area can be provided by placing in the tank a dish or pan large enough for your turtle to lay in and shallow enough for it to easily climb in and out of is required. If a kitty litter pan is used, it must be recessed into the substrate, and the turtle provided with a ramp to get in and out. The water must be changed frequently to keep it scrupulously clean.

You will need two heat sources: a heating pad under the tank and an incandescent or spot light over or to one the side of the tank. If using a wooden tank, the heating pad can be placed inside under the substrate. A large hot rock may be used only if it is set into the soil with a pie plate or other heat diffuser is placed over it, bringing it up to just below the surface of the soil; don't expect the turtle to just climb on top of the bare rock. Note that even with the diffuser, this will not provide enough heat over the broad area that is provided by a heating pad. The turtle may also dislodge the diffuser as it burrows around, requiring you to constantly "replant" it.) The heating pad (or hot rock) must be kept on all the time or as needed to maintain the proper temperatures.. The temperature ranges required by the different species are: Ornate boxes: between 85-88oF/day, 70-75o/night; Other U.S. box turtles: 85-88o/day, 70-75o/night. Chinese boxes: 75-85o; Malayans: water temperature 78-85o and air temperature 85o. You need to invest in a submersible water heater if you cannot get or keep the water consistently hot enough with the substrate and overhead heat sources. Buy a couple of aquarium or reptile thermometers; they are much cheaper than paying veterinarian expenses or replacing a dead turtle.

Full-spectrum lighting is required in addition to any light used to provide heat. Full-spectrum light mimics the beneficial effects of sunlight, enabling the reptile to metabolize vitamin D3. There are full-spectrum lights made for reptiles. Some are screw-in types that will fit into properly rated incandescent sockets; others are tubes which slip into fluorescent fixtures. The full-spectrum is an essential part of the calcium metabolization process. With out the specific wavelengths and proper diet, calcium deficiencies will result which may ultimately prove fatal. Use a timer to turn the lights on and off; they need to be on 12-14 hours each day.

FOOD

The best time to offer food is after the turtles have had several hours to warm up in the morning. Offer food daily to youngsters, every other day to adults. Since turtles are motivated by sight and smell, offer a varied, colorful diet. At each feeding, there must be both plant matter and animal products. Add vitamin supplement (such as Reptivite) twice a week.

A variety of vegetables, greens and fruits must be offered. A grated/shredded salad of carrots or orange squash, green beans, soaked, mashed high quality dog kibble, and fruit (such as strawberries, raspberries, cranberries, blackberries, cherries, plums) should be all mixed together. Serve with some cantaloupe (with the rind), mustard, dandelion and collard greens. For treats, add flowers (hibiscus, rose petals, geraniums, nasturtiums). Occasionally, offer chard, sweet peppers, left-over vegetables and fruits from your meals. (Box turtles can eat the same salad that the iguanas, tortoises and omnivorous skinks eat.)

Meat/Live Foods. Many diets recommend high quality (low fat) canned dog food (especially chicken); finely chopped cooked chicken or raw beef heart. Most turtle people, however, prefer to supplement protein by feeding several freshly molted king mealworms (*Zoophorba* king worms) or *Tenebrio* mealworms (the tough brown exoskeletons are not digestible); earthworms and nightcrawlers (avoid bait shop worms - these are usually raised under rabbit hutches and are filthy with bacteria and protozoa); small pinky mice; slugs and snails (if caught in your garden, feed the snails and slugs for 4 days on dark leafy green vegetables - any that have been exposed to poisons will die in that time) and crickets (which have been fed on tropical fish flakes and fresh fruit for at least 24 hours). Remember that young

turtles eat more animal matter than do adults, so the amount of protein offered should decrease over time until it is no more than 10% of total food volume.

Special Notes:

There are two box turtles which are being imported into the U.S. which have slightly different requirements than do the native *Terrepenes* species.

The Malayan, or Amboina, box turtle, *Cuora amboinensis*, is more aquatic than the *Terrepenes* box turtles. They require a large area of water (at least 50% of total enclosure) which is at least as deep as the height of the turtle. Like the slider and painted turtles, the Malayans' water must be kept scrupulously clean; a filter system should be used, and feeding them in a separate enclosure is recommended. (See temperature requirements above in the Heating section.) Although the Malayan box turtles are considered to be hardy and relatively easy to care for, they are shipped under the typical export conditions and should be checked by a vet soon after purchase. Along with worms and protozoan infections, they may be actively infected with other diseases which are communicable to humans.

The Chinese box turtles, *Cuora flavomarginata*, also need a large water area. A large kitty litter pan sunk into the ground is generally an adequate size; be sure the turtle has a way to climb in and out of it. They should be offered the same diet as the American box turtles, but small fish (feeder goldfish) can be offered as well. While these are hardy turtles which tend to do well in captivity, they cannot withstand cold temperatures; anything below 70oF is dangerous, leading as it can to illness (except during winter cooling, at which time temperatures can drop as low as 65oF) or, in a stressed turtle, death.

The Ornate box turtle, *Terrepenes ornata* are less hardy than the other American box turtles (*T. carolina* ssp.). Their high death rate is compounded by the fact that adults are less able to adapt to conditions of captivity and it is the adults that are most often captured and sold in the pet trade. Ornates require a hollow log or bark slab under which to hide. The sterile potting soil substrate, into which sand has been added (25% of substrate) should be kept dry and allow for easy digging and drainage. Ornates help meet their needs for constant temperatures and humidity by hiding under their log much of the day. A light misting on warm days (85-88oF), moderate nighttime temperatures (70-75oF), and a large shallow pan of fresh water should be available at all times. Unlike the other box turtles, Ornates are primarily insectivorous, and may also feed under water. They are often reluctant to feed in captivity, so monitor them carefully. Live foods should be offered regularly; feed in the early mornings and late afternoons when the turtles are active.

HEALTH

Watch your turtle for any signs of illness: cloudy, closed or swollen eyes; swollen cheeks; open mouth breathing; bubbly mucous around the nose or mouth; runny stools; loss of appetite; listlessness; spots appearing on plastron (bottom shell), carapace or body; soft shell or excessive shedding or sloughing of skin or scales; buildup of food and dead skin around head and neck, and weight loss. Newly acquired turtles are under a lot of stress and may be riddled with bacterial or parasitical infections that may be passed along to you or your kids. Always take a sick turtle to a reptile veterinarian, and have your children checked out by their physician if they begin to exhibit any signs of illness (nausea, stomach aches, vomiting). Always wash your hands after handling the turtle and objects in the turtle

tank. Make sure your kids wash carefully in hot soapy water - young children especially are susceptible to salmonella infections.

ACCLIMATION AND HANDLING

After bringing home and placing your turtle in its already-established tank, let it get used to its new surroundings for several days. It may spend the first couple of days closed tight in its shell, or may quickly withdraw when it sees you looming overhead or approaching the enclosure. During this time, put fresh food out every day (on a large jar lid or in a shallow bowl), and make sure the water stays warm and clean. After a while, the healthier turtle will begin to explore its surroundings, and may begin to watch the goings-on around it.

When you pick up the turtle, support its body with both hands. Turtles feel more secure when they can feel something beneath their feet; "swimming" in air - "cute" though it may be - is stressful to them. Let them feel your hands or fingers beneath their feet. A two-handed carry will also help ensure that they will not suffer a potentially crippling--or fatal--fall. When your children's hands are big and steady enough, teach them the proper way to hold and carry the turtle, and to wash their hands after handling the turtle. If they have been playing with any other animals before they go to handle the turtle, they should wash their hands before handling the turtle, too.

Generally speaking, turtles are not appropriate pets for young children. The care and feeding is more complicated than is generally thought, and the daily maintenance of the enclosure, enclosure apparatus and feeding soon gets boring for most kids. (Some adults, too, are dismayed to find that they can't just stick the turtle in a box or in their yard and toss lettuce to it once in a while.) When obtained for a child, the parent must acknowledge and accept primary responsibility for the care of the turtle and check it regularly for any signs or symptoms of illness. Scientists believe that many cold-blooded animals, especially turtles and tortoises, can live almost forever (well, one hundred years, at least) as they show no signs of aging as they get older. They die from being successfully attacked by one of their few natural predators, from the poisoning or destruction of their natural habitat, and from improper care in captivity.

BOOKS

Some books to read about turtles and turtle care include:

Alderton, David. *Turtles and Tortoises of the World*. Facts on File, Inc.

Carroll, David M. *The Year of the Turtle: A natural history*. Camden House publishing.

De Vosjoli, Philippe. *The General Care and Maintenance of Box Turtles*. Advanced Vivarium Systems, Inc.