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Colorado Reptile
Humane Society

Colorado Reptile Humane Society's Guide to North American Box Turtle, Mud Turtle, and Russian Tortoise Hibernation

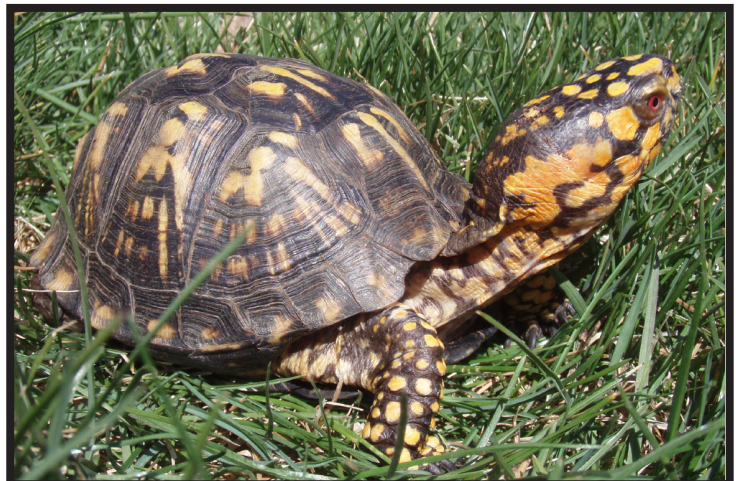
Why should I hibernate my turtle/tortoise?

As fall approaches, hibernating turtles and tortoises eat less, become sluggish, and burrow for days at a time. This is both a response to the cooling and shortening of days and a result of their natural hormonal cycle. Even turtles kept indoors under consistent conditions will experience this fall slow-down. These turtles are readying themselves for hibernation. In their natural habitats, North American box turtles burrow into the ground and hibernate for a time period of four weeks to six months, while Russian tortoises may hibernate for up to eight months in their native land! While mud turtles spend a great deal of their active time in water, they do hibernate in terrestrial burrows.

Captive North American box turtles, northern species of mud turtles, and some tortoise species should be hibernated in the winter months to promote long and healthy lives. This includes the eastern box turtle (*Terrapene carolina carolina*), three-toed box turtle (*T. c. triunguis*), ornate or western box turtle (*T. ornata ornata*), yellow mud turtle (*Kinosternon flavescens*), eastern mud turtle (*K. subrubrum*), and the Russian or Horsfield's tortoise (*Testudo* or *Agrionemys horsfieldii*). Desert box turtles (*T. o. luteola*) generally hibernate for a shorter period, while Gulf Coast box turtles (*T. c. major*) and Florida box turtles (*T. c. bauri*) are from warmer climates and do not hibernate to the extent of their more northern cousins.

Some scientists claim that reptiles do not enter a true state of hibernation like mammals, describing their overwintering behavior as torpor or brumation. Others say that reptiles do, in fact, achieve true hibernation. For our purposes, the term hibernation will suffice – essentially, their bodies cool, they slow down, and they “sleep” for several months, during which time they expend little energy and don't require food. As the weather warms in the spring, they emerge from their overwintering site ready to eat, drink, and engage in turtle merriment.

In pet turtle care guides, the primary (and often only) reason given for hibernation is to increase ability to procreate. While true, this is not the reason why we hibernate turtles (we do not support captive breeding of any reptile species, except in legitimate conservation programs), nor is it the only reason for hibernation. In addition to synchronizing reproductive cycles and stimulating hormone development, hibernation offers a number of benefits for your turtle's health and longevity. The hibernation period provides the opportunity for turtles to replenish their immune systems. While skipping hibernation for a year or two may not result in an



Kirk, a healthy and active eastern box turtle



observable decline in health, over many years they may become immunocompromised and suffer from increased susceptibility to a variety of ailments. Also, hibernation is necessary to maintain normal hormone activity in the body, especially in the thyroid. Veterinarians, scientists, and turtle-lovers agree: hibernation will allow your turtle a longer and healthier life.

How do I know if my turtle/tortoise is healthy enough for hibernation?

Any turtle that is underweight, suffering from illness, or otherwise unhealthy should NOT be placed in hibernation. Indications that your turtle is unhealthy include swollen or puffy eyes, nasal discharge, dehydration, swollen ears, low body weight, and lethargy. Sick turtles should be taken to a veterinarian as soon as possible. When your turtle recovers fully, we recommend a shortened hibernation if enough time remains in the season and your veterinarian recommends it. For juvenile turtles, we recommend a closely-monitored hibernation identical to that of adult turtles.



A box turtle suffering from an ear abscess



A box turtle with swollen eyes



A box turtle with eye discharge



A box turtle with nasal discharge

How do I hibernate my turtle/tortoise?

We should try our best to simulate the natural pre-hibernation process, which in the wild happens over a period of several weeks. For turtles kept outdoors in Colorado, this cool down will happen naturally with the turn of the season. We usually start withholding food around the end of September and turtles enter hibernation by mid-October. Turtles will be less active, but should still appear alert and responsive. During this time, offer your turtles a soaking at least once every 2-3 days. Soakings should take place in about ¾ inch of tepid water and last 20-30 minutes. This will allow the turtle ample opportunity to both drink water and void waste, two extremely important pre-hibernation processes.

For turtles kept indoors, food should be withheld and turtles kept under normal husbandry conditions for a period of 2-3 weeks. This will allow the gastrointestinal tract to empty. Undigested food in a turtle's

gut may rot during hibernation and cause serious problems. The temperature should be reduced gradually over the third week. Lower their temperature to about 65°F (18°C) for 2-3 days, then to 55°F (13°C) for another 2-3 days. Follow the same soaking procedures as with turtles kept outdoors, as described above.

Now that your turtles are well-hydrated, have empty digestive tracts, and are cooled down, they are ready to enter hibernation. A wooden or plastic box or storage container, with a lid and sufficient air holes, will work as a hibernaculum. The container should be filled with 4-8 inches of a substrate that can hold moisture – this can be any combination of peat moss, shredded newspapers, coir, or commercial substrates suitable for reptiles, such as Carefresh or Bed-A-Beast. For box turtles, the substrate should be very moist, but not so much that it drips water when you squeeze a handful. We use coir (crushed coconut husk) which is available at most home and garden stores. *For Russian tortoises, the substrate should be drier, but still damp – with products like coir that require water to expand, allow the substrate to dry out for several days before use.* Do not use any substrate that contains fertilizers, plant food, or other chemical additives.



A plastic hibernaculum with air holes, packed with substrate

Place the turtle in the hibernaculum partially buried so that they can find a position most comfortable for their long winter nap. Take great caution to ensure that rodents do not have access to your hibernating turtles, for they can inflict great harm on a turtle in this vulnerable state. It is possible to hibernate several turtles in the same hibernaculum. If doing so, it is best to separate the males and females; even at low temperatures, the males' sexual pursuits may pester the females.

Your hibernation location should remain at a fairly constant temperature between 35°F (2°C) and 45°F (7°C). Though turtles use very little oxygen during this time, a degree of air circulation is essential. An indoor location that meets these requirements will work – a garage, crawl space, attic, or basement. It is essential that you monitor these temperatures daily. Turtles can withstand sub-freezing temperatures for short periods of time, but this is extremely stressful and prolonged exposure can result in injury or death. Closely monitor temperatures and immediately remove a turtle if temperatures drop below 32°F (0°C).

During the hibernation process, it is critical to monitor your turtles' health. Once every 2-4 weeks, remove them from hibernation by placing their hibernaculum in room-temperature and allowing them to gradually warm over a period of 2-3 hours. Then, give your turtles a soaking (as done in the pre-hibernation process), check their overall appearance for indications of poor health, and weigh them. Also check for signs of defecation in the hibernaculum, as this can indicate too high of a hibernation temperature. *Any turtle that shows signs of poor health or loses more than 10% of its body weight should be removed from hibernation immediately, placed in normal husbandry conditions, and taken to your veterinarian.* More than one misleading care guide states that it is normal for turtles to appear malnourished and skinny during and after hibernation – it is not! Ideally, a healthy turtle should lose no weight at all during this time – their body is operating at such a phenomenally slow pace that it uses very little of the turtle's energy stores. After the soaking and check-up, healthy turtles can be placed immediately back into hibernation.

I can hibernate my turtle in a refrigerator!?

Yes! This is actually our recommended hibernation method. Though it seems very weird to put your beloved turtle into a refrigerator for several months, this method has proven extremely effective (and amusing to house guests unfamiliar with hibernating pets). After all, refrigerators are constructed for the very thing we need – to provide a space where temperatures remain constant at around 40°F (4.5°C).

There are several things that you must consider when using a refrigerator. A refrigerator will NOT



protect your turtles from cold ambient temperatures. That is, if you place your refrigerator in a garage where the temperature drops below 32°F (0°C), the temperature within the refrigerator will drop as well. On the other hand, turtles hibernated above 50°F (10°C) can suffer from weight loss, dehydration, the exhaustion of energy reserves, and the build-up of toxins. Use a thermometer with a probe placed in the hibernaculum near the turtles to closely monitor hibernation temperatures. Digital thermometers with memory and alarms are available from online reptile or electronic equipment suppliers. Stocking extra space in the refrigerator with additional mass, such as bottles filled with water, will increase temperature stability. It is best to use a reliable model that you have tested with a thermometer for several weeks before hibernation. Calibrate your refrigerator before putting the turtles into hibernation, as adjusting the thermostat during hibernation may have unexpected results. Some models can malfunction and freeze, while others may fluctuate wildly. Hibernating a turtle in the same refrigerator where you keep your food is a health risk for you and will result in constant disruptions to your turtle. Finally, we do not recommend using a unit with a built-in icebox because of the risk of malfunction and possibility of freezing.



A refrigerator with hibernaculum, thermometer, water jugs, and air supply



An aquarium air pump circulating air

Since refrigerators are air tight, you will also need to provide a supply of fresh air. This can be done cheaply and easily with an aquarium air pump. Place the unit outside of the refrigerator and use tubes to direct the airflow inside. You may need to cut a small notch in the door seal and run the tubes through this notch in order to shut the door completely. In addition to the air pump, open the door 3 times a week for a minute or two. This combination will provide ample oxygen for your turtles. In addition to these considerations for refrigerator hibernation, follow the same check-up procedures every 2-4 weeks, as described above.

How do I take my turtle/tortoise out of hibernation?

Here in Colorado we normally take our turtles out of hibernation around the third week of April, at which time they can live outdoors day and night and gradually adjust to the natural warming of spring. Turtles can be placed directly in their outdoor pens; a transition period to an indoor pen is not necessary.

If keeping turtles indoors year-round, remove the hibernaculum and allow it to warm gradually to 60°F (15°C). Once at this temperature, remove the turtles and maintain them at 60°F (15°C) for two days, then to 65°F (18°C) for two days, then to normal conditions – daytime temperatures 70°F (21°C) to 80°F (27°C). Soak the turtles once every 48 hours during this process.



After two days at normal conditions, offer food and watch the merriment begin! Turtles usually become fully active and start eating 3-4 days after hibernation, but this may vary widely. Some are ready to eat and mate within minutes, others may take weeks. Be patient, but watch your turtles carefully for signs of illness and take them to your reptile vet at the first indication of problems.

Can I hibernate my turtle/tortoise outdoors?

We generally recommend against this for several reasons: 1) Nobody knows a better location for hibernation than a turtle. In the wild, turtles roam an area of several acres to find the perfect hibernation spot. It is impossible to offer this type of landscape diversity and hibernation options in captivity. 2) Colorado weather fluctuates dramatically and unpredictably. Often during warm days in the winter, turtles may emerge to relocate or because they are duped into thinking that spring is at hand. It is not unusual for Colorado temperatures to drop nearly 50°F in a period of 12 hours. A turtle that emerges on a warm afternoon may not have time to find a suitable site before temperatures drop below freezing. 3) It is difficult, if not impossible, to check on your turtles and monitor their health if they are hibernating outdoors.

As you hibernate your turtle or tortoise, remember these important points:

- Turtles should have an empty gut & show no sign of illness.
- Keep hibernating turtles at a constant 40°F (4.5°C).
- Provide a damp substrate for box and mud turtles, drier substrate for Russian tortoises.
- Hibernate 4-6 months (usually mid-October to mid-April).
- Soak, weigh, and check health every 2-4 weeks.

We hope this information helps to increase the length and quality of your turtles' and tortoises' lives. If you have questions, feel free to contact Colorado Reptile Humane Society through our website, www.corhs.org.

Sources

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