

# California Turtle & Tortoise Club:

## A Guide to the Care of the Desert Tortoise

**Important:** No one care sheet can possibly cover all the variables in different localities that influence the care of our desert tortoises, as well as the ongoing discovery of new information. It is highly recommended that you join an online discussion group where fellow keepers can assist with questions/issues not covered in the following care sheet. Two recommended groups are the CTTC Turtle & Tortoise List ([http://pets.groups.yahoo.com/group/CTTC\\_Turtle\\_And\\_Tortoise\\_List/](http://pets.groups.yahoo.com/group/CTTC_Turtle_And_Tortoise_List/)) and the Gopherus List (<http://pets.groups.yahoo.com/group/Gopherus/>).

### Introduction

This care-sheet provides information on caring for **adult** desert tortoises and their hatchlings. Your location and environment may require modifications of suggestions. The desert tortoise (*Gopherus agassizii*) is endangered in the wild and is protected under Federal and State laws. It is illegal to buy or sell desert tortoises, or to take them from the desert. In California, a permit (<http://tortoise.org/general/permit.html>) is required to possess captive desert tortoises.

Obtaining a permit is simple. Contact the California Department of Fish and Game, or the California Turtle and Tortoise Club for a permit application. The California Department of Fish and Game provides a tag to attach to the tortoise, and this is a useful way of identifying your tortoise if it should stray. Possession of a permit/tag DOES NOT authorize breeding. California Turtle and Tortoise Club Adoption Chairs now tag all tortoises that are placed through the CTTC adoption programs.

For good reason, it is against the law to release captive desert tortoises back into the wild. Released captives have a low survival rate and may pass diseases into the wild population with devastating consequences. Contact the California Turtle and Tortoise Club if you need to find a new home for a tortoise. Most chapters of CTTC have numerous desert tortoises needing new homes so PLEASE DO NOT TAKE THEM FROM THE DESERT.

### Care of Adult Desert Tortoises

Desert tortoises are known to live as long as 60-80 years, and may live even longer. Because growth varies with food availability and other conditions, tortoises grow faster in captivity than in the wild. It is impossible to determine the exact age of an adult tortoise.

### Housing

In order to thrive, adult desert tortoises must be kept outdoors in a large area. They should be provided with shelter from the sun and cold, and a place to retire at night. They need plenty of room to exercise and browse. If possible, give them the run of your entire yard. Make sure that the yard is escape-proof and that pools are fenced off. Eliminate any poisonous plants (<http://www.tortoise.org/general/poisonp.html>), and do not use chemical pesticides or fertilizers in the area. Toxicity scale for poisonous plant list is at bottom of the list. Note that the list is geared towards mammals as there no accepted list for tortoises thus many keepers prefer to err on the side of caution and provide plants for them that we KNOW are SAFE. It is cruel and inhumane to tether a tortoise by the legs or by holes drilled in the shell. Consult with CTTC on proper enclosures, fencing and security instead.

### Feeding

Healthy tortoises have enormous appetites! Growing native grasses, wildflowers, grass, weeds, dandelions, alfalfa (in moderation), nopales (*Opuntia* cactus), mulberry tree leaves, grape leaves, common cheese mallow and other mallows, chickweed, nut grass, and (for treats) rose petals, nasturtium and hibiscus flowers are excellent food sources.

If limited in growing foods, supplement this diet with occasional foods such as endive, escarole, squash such as zucchini, chopped carrots, small amounts of kale, romaine and other dark-green leafy vegetables. Sprinkling the food with ground-up rabbit or guinea pig pellets or mixing with Bermuda or Orchard grass hay is a good way to add extra fiber to the diet. See "Feeding" in the "Care of Hatchling Desert Tortoises" section for sources from which to purchase Desert Tortoise Seed mixes and edible native wildflower seeds.

Tortoises have a high calcium requirement: occasionally sprinkle the food with calcium carbonate (WITHOUT phosphorus as this binds calcium making it unavailable for bone/shell growth), or offer an always available calcium-rich source such as boiled chicken eggshells or cuttlefish bone (preferred - always remove hard, thin outer layer to prevent choking) for them to eat. DO NOT use calcium with added vitamin D3 if tortoise is kept outdoors. Occasionally sprinkle the food with a suitable vitamin preparation if you are unable to provide a large variety of natural foods to graze upon. All foods should be fertilizer free and MUST be pesticide free. Provide a shallow dish of water for drinking and soaking - KEEP CLEAN daily and ALWAYS IN SHADE.

Avoid excessive use of foods that are high in oxalic acid (which binds calcium) such as parsley, purslane, amaranth, spinach, beet leaves, collards, Brussels sprouts. Also avoid excessive foods in the Brassica family such as broccoli, cauliflower and mustard greens as they suppress iodine uptake and may be implicated in health issues, i.e., goiter. Excessive fruits (other than the "cactus apple" from *Opuntia* cactus in season) should not be fed as they may upset digestive flora and can result in overgrowth of intestinal parasites. NO banana at all, especially to hatchlings as they can choke. DO NOT feed soy, tofu nor ANY animal protein such as cat or dog food. Commercial pellet tortoise food products from pet stores are not a good choice for the major part of a desert tortoise diet.

### Sexing

Desert tortoise hatchlings have a flat plastron (bottom shell) until they reach about 8 inches in length (10-15 years of age in the wild; 5-10 years in captivity). At this time the plastron of the male becomes noticeably concave, whereas the female's plastron remains flat. Adult males also have longer gular horns, a longer tail, and enlarged glands under the chin.

Shortly after emerging from hibernation, male tortoises will begin pursuing the females. Male tortoises will frequently fight with each other at this time. Because of the risk of one being overturned, it may be necessary to keep males separated from each other. Sometime between May and July females will begin to carefully search for a suitable site to dig their nests, in which they will lay a clutch of 2 to 12 pingpong-ball sized eggs. Often they will undertake several "trial" excavations in the process. Occasionally a female may lay more than one clutch in a season. PLEASE NOTE that it is against Federal and California State regulations to intentionally breed desert tortoises. You may NOT artificially incubate eggs. If laid in the ground and they hatch, please contact your local CTTC Chapter for placement assistance. Please do not immediately feed grocery produce to newborn hatchlings as they lack digestive flora to digest such foods (digestive flora is established by eating small amounts of dirt around the base of plants or by eating dried fecal matter ("scat") from other healthy tortoises of the same species.

## Health

It is important that the keeper gets to know the normal behavior of his/her tortoise because behavioral changes are often the first sign of illness. Tortoises are susceptible to respiratory ailments, such as the Upper Respiratory Tract Disease (<http://www.tortoise.org/general/urds.html>) that has decimated the wild population in California and Nevada. Warning signs are a runny or bubbly nose, loss of appetite, and gasping. Respiratory disease symptoms can often be cleared if treatment is begun immediately, however, there is no "cure" for URTD. For swollen eyes, wounds or injuries contact a veterinarian immediately. Swollen and sunken eyes are often mis-diagnosed as vitamin A deficiency when it is in fact a dehydration or respiratory illness issue. NEVER allow a veterinarian to inject vitamin A if a tortoise is grazing on grasses/weeds and eating a healthy green diet. Sick or wounded tortoises MUST be moved inside away from flies. Worms and other parasites are sometimes a problem in desert tortoises. Symptoms such as loss of weight, and lack of energy for no apparent reason are an indication can be indicative of parasite overload and a fecal exam should be done by a qualified tortoise veterinarian. DO NOT allow a vet to give your tortoise Albendazole or Ivermectin as they can cause more serious health issues or even death.

The California Turtle & Tortoise Club maintains a list of Veterinarians Who Treat Tortoises.

(<http://www.tortoise.org/general/vetlist.html>) Also check Yahoo Groups Vets for Herps/ ([http://groups.yahoo.com/group/vets\\_for\\_herps/](http://groups.yahoo.com/group/vets_for_herps/)) for veterinarians recommended by keepers and Tortoise Trust HerpVets. (<http://www.tortoisetrust.org/articles/herpvets.htm>)

**ASK** about the veterinarian's experience treating tortoises before allowing the treatment of your tortoise.

## Hibernation

Usually by late October as the days become cooler, the tortoise will eat less, bask less, and appear sluggish. A suitable hibernation place may have to be provided. Some tortoise owners use a dog house insulated with a thick layer of dry soil, leaves, or shredded newspaper. The entrance should be covered with a tarp to protect it from flood or rain.

Many keepers prefer to "store" their pets in the garage. The tortoise is placed in a stout cardboard box, that is deep enough that it cannot climb out, and is covered with insulating layers of newspaper. The box is placed up off the cement floor in an area free from drafts or rats. If the box is placed in your garage, remember not to run automobile engines because of the risk of poisoning from the fumes. A cool closet is also a safe place for hibernation. Many keepers now prefer a "box-in-box" method, where the inner box is large enough for the tortoise to turn around in which is placed in a larger box 3-5 inches larger with insulating layers of newspapers below and around the inner box. This insulation layer helps maintain more stable temps and is very helpful in utilizing a garage or area that is subject to temperature swings. Utilize a minimum/maximum thermometer and strive to maintain temps at 42 to 55°F; do not keep in an area where temps will stay at 60 to 65°F and above for extended periods of time as it can cause increased metabolism, resulting in excessive water/weight loss and possible illness, even death. Use a minimum/maximum thermometer "weather station/remote sensor" to monitor temps inside AND outside of the box to monitor temps in your chosen location, striving for stability.

Some tortoises will build a burrow, and in some areas may successfully hibernate themselves. However, before allowing this, consider the location of the burrow. If there is a significant risk of flooding or the tortoise getting wet - and cold - from heavy rainfall do not allow your pet to hibernate there. A wet and cold tortoise may become ill with respiratory illness and/or pneumonia and can die during "hibernation".

A hibernating tortoise should be checked periodically. A sleeping tortoise will usually respond if its foot is touched. If the tortoise should waken during a mid-winter warm spell, water may be offered, BUT DO NOT FEED. As weather cools again, encourage it to return to sleep. When the days begin to warm, around March or April, the tortoise will become active in its storage box. At this time, a warm bath should be given, and the tortoise will often take a long steady drink. Within a week or two it should resume its normal activity of eating, exercising and sunbathing.

It is important that a tortoise be plump and in good health before hibernating, otherwise, it may not survive the winter. By the end of the summer, a well fed tortoise will form fat reserves around its shoulders and legs. Weigh adult tortoises before and after "hibernation"; juveniles and hatchlings should be weighed before and then every two weeks and if more than 1 to 2 percent of body weight is lost, consider moving to a cooler location. If dehydrated, awaken, hydrate and keep up per below instructions for remainder of winter.

**DO NOT HIBERNATE A SICK OR INJURED TORTOISE!** Nor one that has been treated that summer for respiratory infection such as URTD/RNS/URDS!

If for some reason you do not wish your tortoise to hibernate, it must be brought indoors and kept at a warm temperature (75 to 85°F) for it to remain active, simulating daylight hours of 13-14 hours a day. It will require room for exercising and regular feedings and on sunny warm days at 65 to 70°F, should be taken outside into a wind-sheltered, sunny area for a couple of hours as often as possible.

## Care of Hatchling Desert Tortoises



Like other tortoises, desert tortoises hatch from their eggs with the help an "egg tooth" or caruncle on the tip of their snout. They are folded over inside the eggs, and their soft, flexible shells do not begin to harden until after they hatch. The shell may remain flexible for a few weeks, but should harden with proper diet and sunlight. After it pips the egg shell, a hatchling may wait inside the egg until the yolk sac is absorbed. If the yolk sac is large when the hatchling leaves its egg, place the hatchling on clean wax paper until the yolk is absorbed. Take care during the first few days to avoid rupturing the yolk sac. A ruptured yolk sac can lead to a hatchling becoming infected, causing septicemia, or even bleeding to death.

It is almost impossible to determine the sex of a newborn tortoise from its shape. While few hatchlings survive to adult size in the wild, losses in captivity are not so great, and with proper care most hatchlings will thrive.

## Housing

It is best to house hatchling desert tortoises outdoors in predator-protected pens whenever possible, with LOTS of shade and small sunny area for morning basking during warm months, allowing grazing on small plants of natural grass/weeds/wildflowers. Brumate ("hibernate") them just as an adult does, as in nature.

If this is not possible or in winter you are uncomfortable brumating ("hibernating") them, it is preferable to utilize "tortoise tables" rather than the previously recommended large glass aquarium (glass absorbs and radiates heat from lights) which did not allow for areas of thermo-regulation and promoted climbing and flipping due tortoise being able to see out trying to escape. If you must temporarily use one, cover the bottom 8-10 inches of the walls with a solid paper/tape barrier so they cannot see out. Ensure that it is large enough to allow for a hot end of 80 to 90°F and cooler end of 70 to 75°F to prevent overheating.

By using a "tortoise table", it is easier to provide the temperature-gradient areas from warm to cool to allow thermoregulation, proper air movement, humidity variances including provision of a micro-climate as found in a natural burrow via utilizing an artificial burrow. It is easy and better to build a tortoise table out of an old bookcase, or as in the examples at the links provided below, or even to use a large tub or a child's wading pool. Flat rocks such as flagstone bits help them keep toenails and beaks trimmed, especially if "feeding" - feed them on the flat rocks rather than putting the foods directly on the substrate.

## Tortoise Table links:

David Kirkpatrick Tortoise Table (<http://www.http://www.angelfire.com/al/repticare2/page9.html>)

Tortoise Trust Tortoise Table (<http://www.tortoisetrust.org/articles/Tortoisetable.htm>)

Exotic Pets Tortoise Table (<http://exoticpets.about.com/od/tortoises/qt/tortoiseindoors.htm>)

Newspaper, paper towels, rabbit or guinea pig pellets (the pellets can and do mold easily and dust can cause swollen eyes and runny nose), sterile dry potting soil without moisture retaining additives (screened carefully to remove broken glass, plastic, etc.), or garden soil may be used to cover the floor of the tank. Soil and rocks are best as they are natural and help build muscle strength, allow digging as is their nature while allowing rocks/objects to assist in righting selves if flipped upside down. Whatever floor covering is used, it must be kept clean. A hide box should be provided on the cool end of the habitat, small enough that the tortoise feels safe and secure, as if it is in a snug burrow, for sleeping. DO NOT use calcium sand (sold as Calci-Sand™ in pet stores).

Hatchlings should not be placed with larger tortoises or they may be injured.

## Heating and Lighting

Hatchlings do best when kept in a temperature gradient (meaning gradual variation from one end to another in habitat) of 75 to 90°F during the day falling to 70 to 75°F at night. A temperature gradient can be achieved by heating one end of the enclosure using tank using a heating pad set on low, an under tank heating pad, or a UVB light bulb and leaving the other end unheated. The temperatures generated by these methods will depend upon the size of the habitat aquarium or terrarium, and on the temperature of the room it is located in. Use a thermometer to measure the temperature, preferably one of the weather station min/max type to ensure accurate temperature info. Vitalite and other full spectrum lights DO NOT provide required UVB rays for vitamin D3 formation to utilize calcium; heat pads and heat rocks can and do "cook" hatchling tortoises and are not natural heat sources as is light from above. Types of UVB lighting include fluorescent tubes (provide no heat and lose efficiency quickly, lasting 6 months maximum), or one of the UVB/Heat bulbs (provide heat and UVB), using care to maintain sufficient height above the tortoise so as to not exceed 90°F in the basking area). The tortoise must have sufficient space to escape the heat as in "temperature gradient" above. The light should be turned off at night. Use extreme caution with the Active Heat/UVB bulbs on aquariums as the heat buildup can be fatal to small tortoises. Without making specific "brand" recommendations here, the UVB meter owners group on Yahoo Groups has tested all the lights there are.

Results and information are available online:

Reptile\_UV\_Meter (<http://www.reptileuv.com/uvb-meter-owners/>)

UV\_Guide\_Lighting\_Survey (<http://www.uvguide.co.uk/lightingsurveyintro.htm>)

UV\_Guide\_Links (<http://www.uvguide.co.uk/links.htm>)

Remember, no artificial light source can equal the benefits of an hour or two of sunlight daily.

**IMPORTANT:** Desert tortoise hatchlings spend 95% of their lives underground in burrows with temps of 70's-80's F and excessive time at 95°F+ can "cook" them. Keeping them unnaturally under excessive dry heat conditions is why they are often seen soaking in the water dishes in aquariums-often for hours at a time - which is not natural, healthy behavior but rather an attempt to keep hydrated and save their own lives. This dehydration, possible with excessive heat, heat pads and heat rocks, aquariums, being kept up during winter in gas heated houses, air conditioning, lack of the burrow micro-climate, etc., is believed by many keepers and veterinarians to be the main root cause of bladder stones, as well as possibly implicated in "pyramiding" and soft/sunken in shells and swollen eyes.

## Sunlight

When the temperature is above 70°F the hatchlings should be allowed outdoors to graze and to bask in the sun as much as possible; however, they **MUST** have shade available at all times - full hot sun can cook, dehydrate and kill a hatchling desert tortoise very quickly. They should be placed in an enclosed area covered with chicken wire or similar netting to protect them from birds, cats, dogs, rats and other predators. Check them frequently as they tip over easily.

**NEVER** put tortoises or turtles outside in a glass aquarium. It could heat up like a greenhouse, and hatchlings can succumb to overheating very easily.

## Feeding

If unable to provide small grazing plants in the outdoor garden or in a dish garden, offer a well-chopped and/or grated variety of food several times a day, as their intake is small. Hatchlings should be fed a mix of weeds, grasses, flowers, greens and vegetables. This may include: garden weeds such as dandelions, grass, chickweed, common mallow, clover, mulberry tree leaves, grape leaves, etc. (same foods as adults), hibiscus and rose flowers, clover, nopales (*Opuntia* cactus), endive, escarole, alfalfa (moderation), kale, romaine, chicory. Avoid feeding iceberg lettuce, because of its poor nutritional value. Commercial pellets from pet stores are not good for a majority of a diet.

Again, it is best to provide them with native natural foods/plants to graze upon, sources and info below:

Native Plants for Desert Tortoises (<http://www.tortoise.org/general/wildplan.html>) .

Theodore Payne Foundation (<http://www.theodorepayne.org/>) for desert tortoise seed mix and plants above, with caution to wait at least six months before feeding if the plant is bought in a pot to allow the leaching out of the fertilizers and pesticides commonly used by nurseries in the pots.

Turtlestuff (<http://www.turtlestuff.com>) for desert tortoise seed mixes, edible Mojave wildflower seeds and native Mojave tortoise safe plant seeds for landscaping.

Twice a week, sprinkle powdered calcium carbonate (**without** Phosphorus, as it binds the calcium) on the food, and twice a month sprinkle the food with a vitamin preparation such as Vionate®, Reptivite™ or Superpreen. Supplementation is not needed if you are feeding a variety of natural plants and foods. Since many hatchlings not seem to like the powder on their foods and too much calcium can also create health issues, broken calcium carbonate pills - **NOT** TUMS®, due high sugar content - or cuttle bone pieces (preferred), with the hard, thin layer removed, can be left in the enclosure for the tortoises to eat at will. This allows them to self-regulate calcium intake as they need it with regard to vitamin D3 availability.

Hatchlings should be allowed to soak and drink in a shallow dish of water at least 2 times per week - make water available daily if conditions are too hot or dry. The dish should be small enough so that they can get in and out by themselves. Do not leave hatchlings unattended when soaking as they can flip and drown easily. Liquid vitamin preparations may be added to the water at each soaking, but is not necessary if the hatchlings are grazing on healthy foods.

## Hibernation of Hatchlings

Many tortoise owners feel that hatchlings housed indoors should remain active and not be allowed to hibernate for the first one or two winters, although many also experience difficulty keeping them active and eating. Other keepers feel this is against their nature and "hibernate" them as they would in nature. Preparation and planning are paramount. Only the basics and some cautions are provided here, please visit the link at the end of this section for more detailed procedures. When they do hibernate, keep them at a temperature of about 40° to 50°F in a dark area with clean dry leaves or shredded paper in which they can burrow.

**Preparation:** Hatchlings should not be fed for two weeks prior to being placed in their "hibernation" box, but water should be made available on a daily basis. Grazing on drying grasses and weeds (as in nature) does not seem to be an issue. Feeding flowers, vegetables, grocery greens, and commercial pellet foods should **not** be done. **WEIGH** them before they go to sleep and every two weeks thereafter. The hibernation box should be prepared and placed in its area. The temperature should be read when hibernation begins to ensure required/recommended temps can be achieved. If not, select a new area.

Many of us utilize the adult "box-in-box" method described above. Keep hatchlings at a temperature of about 40 to 50°F in a dark area with clean dry leaves or shredded paper in which they can burrow. Keeping them at temperatures above 60°F for extended periods can result in excessive weight and water loss, illness and even death. Check them every two weeks for both dehydration and weight loss. The most commonly accepted weight loss is less than 1% of total body weight per two-week period. If it exceeds this, be sure they are not too warm and dehydrating, i.e. sunken eyes, skin. A minimum/maximum weather station remote sensor inside and outside of the box is crucial to ensure the accuracy of information on temperatures.

If they awaken after 6 to 8 weeks, they should be slowly warmed to the above indoor temperature ranges. They should be allowed to soak in shallow (no deeper than their bottom shell) warm (80°F) water, and allowed to start feeding on suggested foods above (your weeds will be sprouting and this is good food for them). Many experienced tortoise keepers then utilize tortoise tables for indoors. Place the young tortoises outdoors in the sunshine out of the wind during days when air temps are 65 to 70°F for an hour or two, allowing them to get UVB rays and graze on naturally growing weeds and grasses. Care is required to prevent them getting wet and cold, but this method is successfully used by many keepers. Check on the young tortoises frequently.

For more information on "hibernation", please visit Tortoise\_Trust\_Hibernation (<http://www.tortoisetrust.org/articles/safer.html>) .