



## The Desert Tortoise

The desert tortoise is found in the southwestern U.S. and northern Mexico. Three distinct subspecies of *Gopherus agassizii* have developed, each adapted to the region in which they live: the Mohave, the Sinoloan, and the Sonoran, which is found in the Sonoran Desert in Arizona and Sonora, Mexico.

Sonoran desert tortoises usually live on rocky slopes and upper bajadas populated with palo verde trees, saguaro cacti, and desert scrub. Their preferred shelters are burrows they have dug under large rocks or boulders using their broad front legs. They may take temporary shelter in pack rat structures or in a depression under thick vegetation during the heat of the day.

The home range of most tortoises includes the area in which they were born, although a few have been known to disperse farther. Home range size averages 35 acres, but can vary from 2-132 acres. In addition to sharing their home range with other desert tortoises, it is very common for them to share shelters. There may be a very loose hierarchy of males, but they don't generally spend much energy on a social structure. Tortoises will bob their heads in recognition of others, as a threat, and during courtship. They can make a wide range of sounds, primarily when startled or in distress, that include grunts, hisses, whoops, huhs, and pops.

Because they are cold-blooded, their body temperatures are subject to their environment. Sonorans hibernate during the cold months, from November to March. Spring activity extends from April to mid May. From mid May through June, they will aestivate. During the rainy season of the late summer, from July through October, they will be active again. They are most likely to be active when temperatures are between 68°-104° F. Core body temperatures above 109° F or below 24° F will be lethal.

Fresh plants and dew are their primary source of water. They can hold up to 40% of their body weight in water within their large bladders and can survive up to a year without drinking because urates are precipitated as solids within their bladders and eliminated as a white paste, instead of urine, allowing them to conserve water. Only if they are well hydrated can tortoises obtain food value from dry plant material. Tortoises favor fresh grasses, herbs, and vines. If winter rains have been adequate, Sonorans will eat fresh plant growth in the spring. Following their emergence from aestivation, they may not eat at all until it rains and they have been able to drink water. Then, they can eat dried plants, grasses, and mesquite beans while they wait for the fresh plant growth prompted by the monsoons. Prickly pear fruit, which ripens in late summer and provides them with fat

reserves, is a vital part of their diet. Although they are primarily herbivorous, they may eat insect larvae and feed off carrion.

The carapace is the hard, domed upper shell which is 4-6" tall, up to 15" long, has hexagonal shields, and is green to tan to dark brown. The plastron is the lower shell. Each shield has scutes, or annual growth rings, which can, until they are about 25, help to determine the age of a tortoise. Tortoises' best defense against predators is to draw their heads and legs into their shells. Only mountain lions have jaws strong enough to crack the shell of an adult tortoise.

The point at which a tortoise reaches adulthood and is capable of reproducing is determined more by carapace length than by age. Minimum length for a Sonoran female is about 8.5", which is usually reached at 15-20 years. In late June or early July, female Sonorans will use their rounded hind legs to dig a nest in which they will deposit their eggs. The average clutch size is 5 eggs, but varies from 1-12. The eggs were fertilized by sperm that she had stored in her cloaca after breeding with multiple males during the previous year. In dry years, only larger females are likely to lay eggs, and their clutch size is likely to be reduced.

Their hard shells may prevent desiccation, but the eggs are vulnerable to predation by Gila monsters, snakes, coyotes, foxes, roadrunners, and badgers. Females may stay near the nest and may be able to protect the eggs from some predators. The hatchlings will begin to break out of the white eggs in approximately 90 days. Hatchlings are about 1.6" long. During the first few weeks, their shells are soft, making them extremely vulnerable to predators, including raptors. Although their eggs provided enough food and water for them to survive their first hibernation, they may feed for up to one month on fruit and new plant growth if it is available.

Juveniles must grow quickly in order to survive, as smaller tortoises are more vulnerable to predators, and the growth rate is much faster for hatchlings and juveniles than adults. It is estimated that only one hatchling out of 12 clutches survives to adulthood. Once a tortoise reaches adulthood, it is likely to live many more years, up to 65-80 years in the wild.