

**Disease.** There is little information regarding the diseases of wild tortoises. However, an upper respiratory tract disease (URTD) has been observed in desert tortoises in the western U.S. and in gopher tortoises in the southeast. This disease is contagious and is transmitted by close contact between tortoises. Symptoms of URTD include a clear or white nasal discharge, watery eyes, and swollen eyelids. Tortoises can be "silent carriers", meaning that they have the disease but do not exhibit obvious signs. Mortality from this disease has been high in some desert tortoise populations, but little is known about the effect of the disease on gopher tortoise populations. The occurrence of URTD is a significant concern in regards to gopher tortoise relocation programs. There is always the threat that diseases can be introduced into established populations when tortoises are relocated onto new sites. Captive tortoises, in particular, should never be released back into the wild. It is believed that the release of sick captive tortoises may have been a factor in a 90% decline of desert tortoises on one California preserve.

**Road Mortality.** Many tortoises are killed each year by automobiles. Road mortality will undoubtedly increase as more and more highways are built. Furthermore, roads can act as barriers to tortoise movements, effectively isolating populations. A possible solution to this problem is the construction of underpasses to allow tortoises and other wildlife to pass safely beneath roads. If you encounter a tortoise trying to cross the road, it is best to simply carry the tortoise across the road in the direction it was going if you can do so safely.

**Tortoises as Food.** Tortoises were a reliable source of food during the Depression, when there was little else to eat. Of course, these so called "Hoover chickens" were much more plentiful back then, but overharvest resulted in severe population declines in many areas. Currently, tortoise harvesting is illegal in every state where gopher tortoises are found.

## RESEARCH NEEDS

Many questions about gopher tortoises remain unanswered. How much land is needed to provide adequate habitat for a healthy gopher tortoise population? What are the effects of roads on tortoises and tortoise populations? Do tortoises from different populations have different diseases and parasites? Researchers are trying to answer these questions and others by conducting long-term studies of tortoise populations. We know that many animals use gopher tortoise burrows for shelter. If gopher tortoises disappear, what will happen to these animals? Will the gopher frog, Florida mouse, gopher cricket, and other animals disappear along with the tortoise? Many researchers fear that if this "keystone" species becomes extinct, many other species will soon follow. Further research on the ecology of the gopher tortoise and its habitat is needed to ensure that this species and other unique components of uplands in the southeastern United States are preserved for the future.

## GOPHER TORTOISE COUNCIL

The Gopher Tortoise Council was formed in 1978 by a group of biologists and other citizens concerned with the decline of the gopher tortoise. The goals of the Council are: (1) to offer professional advice for management, conservation, and protection of gopher tortoises and their habitat; (2) to encourage the study of gopher tortoises and upland ecosystems; (3) to conduct public outreach and education programs; (4) to seek effective protection of the gopher tortoise and other upland species.

The Council supports environmental education programs and through the generous donations of many of our members, has contributed funds for the purchase of critical habitat for the gopher tortoise and other upland species. The Council has contributed financial support to graduate student research projects and environmental educators with upland-related projects. If you would like to become a member of the Gopher Tortoise Council, please complete the form below and return it to the Florida Museum of Natural History. [www.gophertortoisecouncil.org](http://www.gophertortoisecouncil.org)

*Original brochure by: Catherine Puckett and Richard Franz;  
revised by Lora L. Smith and Kristina Sorensen.  
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Photos by Joan Berish.  
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I wish to:

\_\_\_\_\_join the Gopher Tortoise Council.

\_\_\_\_\_renew my membership.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_ Zip \_\_\_\_\_

Home Phone : (\_\_\_\_) \_\_\_\_\_

Work Phone : (\_\_\_\_) \_\_\_\_\_

Email: \_\_\_\_\_

Please indicate your membership category:

\$15 \_\_\_ Student

\$25 \_\_\_ Regular Member

\$40 \_\_\_ Contributor

\$50 \_\_\_ Corporate/Society

\$75 \_\_\_ Sustaining Member

\$300 \_\_\_ Life Membership

Please make checks payable to the Gopher Tortoise Council. The Gopher Tortoise Council is a nonprofit organization and all contributions are tax deductible.

Gopher Tortoise Council  
c/o Florida Museum of Natural History  
P.O. Box 117800  
University of Florida  
Gainesville, FL 32611

[www.gophertortoisecouncil.org](http://www.gophertortoisecouncil.org)



**THE GOPHER TORTOISE:  
A SPECIES IN DECLINE**

## THE GOPHER TORTOISE: A SPECIES IN DECLINE

"...Everything affecting the gopher tortoise's habitat affects the tortoise and ... eventually affects all other organisms in its ecosystem. Efforts to save the gopher tortoise are really a manifestation of our desire to preserve intact, significant pieces of the biosphere.

"...We must preserve...the gopher tortoise and other species in similar predicaments, for if we do not, we lose a part of our humanity, a part of our habitat, and ultimately our world."

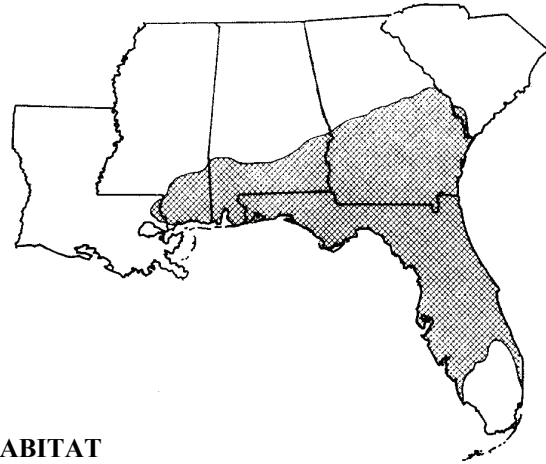
Dr. George W. Folkerts  
Dept. of Zoology and Wildlife Sciences  
Auburn University, Alabama

### HISTORY

The gopher tortoise (*Gopherus polyphemus*) belongs to a group of land tortoises that originated in western North America nearly 60 million years ago. At least 23 species of tortoise are known to have existed on our continent since that time, but only four remain today. Three of the living species, the desert tortoise (*Gopherus agassizii*), Texas tortoise (*Gopherus berlandieri*), and Bolson tortoise (*Gopherus flavomarginatus*), are found in the southwestern United States and northern Mexico. The ancestors of gopher tortoises, along with those of scrub jays, burrowing owls, and short-tailed snakes, were part of a savanna fauna that migrated into the southeastern United States millions of years ago.

### DISTRIBUTION

Gopher tortoises occur in upland habitats throughout the coastal plain of the southeastern United States, with most being found in north-central Florida and southern Georgia. Their numbers have declined range wide due to overharvest and habitat loss.



### HABITAT

Gopher tortoises live in extensive subterranean burrows they dig in dry upland habitats. The habitats where gopher tortoises are found include longleaf pine sandhills, dry oak hammocks, scrub, pine flatwoods, dry prairies, and coastal dunes. Tortoises can also live in man-made environments, such as pastures, old fields, and grassy roadsides. To be suitable for gopher tortoises, the habitat must have relatively well-drained sandy soils for digging burrows, herbaceous food plants, and open sunny areas for nesting and basking.

Periodic fires play a critical role in maintaining tortoise habitat by opening up the tree canopy and promoting growth of herbaceous food plants. If natural fires are suppressed, habitats will become unsuitable for tortoises. Today, land managers use prescribed fire to maintain tortoise habitat.

### LIFE HISTORY

The life of a gopher tortoise revolves around the tunnel-like burrow that the tortoise excavates using its shovel-like front feet. Burrows can be up to 40 feet in length and 10 feet deep. Each burrow has a single opening, and the width of the burrow is approximately equal to the length of the tortoise, allowing the tortoise to turn around at any point within the burrow. Gopher tortoise burrows are usually easy to spot in the landscape because of the characteristic mound of loose sand at the burrow entrance (called the "apron").

The burrow environment remains at a fairly constant temperature and humidity year-round, thus providing shelter for the tortoise during periods of extreme tem-

drought, and fire. Tortoise burrows also afford refuge to more than 360 other animal species. These include the indigo snake, gopher frog, Florida mouse, burrowing owl, gopher cricket, scarab beetles, and many others. Some, such as the gopher cricket, cannot exist without the tortoise burrow.

Gopher tortoises feed on a large variety plants including grasses, gopher apple, pawpaw, blackberries, and legumes. If you have gopher tortoises living on your property, landscaping with native plants will help ensure that proper food is available.

Gopher tortoises are thought to live 40-60 years. They grow relatively slowly and growth rates vary by geographic region and the quality of food plants available. A female tortoise reaches sexual maturity when the shell length is approximately nine inches which can take ten to fifteen years in northern Florida and up to twenty-one years in southwest Georgia. Adult female gopher tortoises are slightly larger than males, and at maturity, male tortoises typically have a concave lower shell (plastron).

Gopher tortoises typically breed from April to June, but males may attempt to mate into the late summer or fall. During May and June, female tortoises lay an average of 5-6 eggs, but there are reports that some tortoises may lay up to 25 eggs. Eggs are deposited either in the sand mound in front of the burrow or in another nearby sunny place. Eggs hatch in 80 to 100 days. Females produce only one nest per year and may not reproduce every year. Nest predation can be quite high and an individual female may produce a successful nest as infrequently as once in 10 years. Nest predators include raccoons, foxes, skunks, and armadillos.

Hatchling gopher tortoises may dig a burrow immediately or use a shallow temporary shelter in the ground called a pallet. On rare occasions hatchlings have been observed entering adult burrows. Young gopher tortoises are especially vulnerable to predation until their shell hardens at about 6-7 years of age. Raccoons, indigo snakes, red-tailed hawks and fire ants, among others, eat hatchlings and young tortoises. Adult tortoises have few enemies other than humans, although domestic dogs and raccoons are known to eat them.

### LEGAL STATUS

Gopher tortoises are afforded legal protection throughout

their range. **A permit is always required to possess, study, or relocate gopher tortoises.** In the 1980s, Florida prohibited the harvest of tortoises, banned the use of gasoline to collect rattlesnakes from gopher tortoise burrows, and banned tortoise races. The legal status of the gopher tortoise in Florida and other states where it occurs is listed below:

*Georgia*- state listed as a Threatened Species.

*Florida*- state listed as a Threatened Species.

*South Carolina*- state listed as an Endangered Species.

*Mississippi*- state listed as an Endangered species; federally listed as a Threatened species.

*Alabama*- state listed as protected; populations west of the Tombigbee and Mobile Rivers are federally listed as a Threatened species.

*Louisiana*- state and federally listed as a Threatened species.

### PROBLEMS-AND A FEW SOLUTIONS

The gopher tortoise is declining throughout its range. Some researchers have projected that unless something is done to reverse this decline, this species may soon be found only in protected areas.

#### Why is the gopher tortoise in trouble?

**Habitat Loss.** Habitat alteration in the form of land development and fire suppression poses the most serious threat to the continued survival of the gopher tortoise. Both people and tortoises like to live in high, dry areas. In addition, phosphate, limestone, and sand mining have destroyed countless acres of habitat, particularly in Florida.

Conversion of our native pine forests to short rotation silviculture can also render habitat unsuitable for gopher tortoises. For example, if pines are planted too close together, insufficient sunlight reaches the ground, limiting the growth of plants that the tortoises depend on for food. Intensive site preparation also can harm gopher tortoises by destroying burrows and nests. However, land management practices such as tree thinning and the use of prescribed fire can be beneficial to tortoises. These activities open up the tree canopy and allow sunlight to reach the forest floor with minimum soil disturbance, thus encouraging the growth of grasses and other gopher tortoise food plants.