

The Texas horned lizard (*Phrynosoma cornutum*) belongs to a unique group of North American lizards known as horned lizards. All 13 species of horned lizards are small, earth-toned and have rounded, flat bodies. The scientific name for the group, *Phrynosoma*, literally means "toad-body." Because of their resemblance to toads in body shape and coloration, many people know these lizards as "horned toads" or "horny toads." But despite their appearance, horned lizards are in no way related to toads; their closest relatives in Oklahoma are the fence lizards commonly seen in wooded habitats.

Horned lizards are named for the unusual hornlike spines on the back of their heads and the smaller spines scattered over their backs and sides. These "horns" do not contain bone but are actually specialized body scales that serve to protect the lizards from predators. They help camouflage the lizard by breaking up the outline of its body and make the lizards more difficult to swallow, thus discouraging some predators.

From the tip of the snout to the base of the tail, adult Texas horned lizards reach a length of 4 to 6 inches. Females often grow slightly larger than males, but the difference is not great enough to determine the sex of a lizard by sight. Males and females have few external differences except that males have visible pores along the lower hind surface of each thigh and a slight swelling at the base of the tail. Little information is available on their normal lifespan, but horned lizards can live at least five years. A second horned lizard species, the round-tailed horned lizard (*Phrynosoma modestum*), occurs in the north-west corner of the Oklahoma panhandle. This species' coloration is more pale and has less distinct "horns."

#### Adaptations for Survival

Avoiding predators influences many of the Texas horned lizard's behavioral and physical adaptations. Though capable of running quickly for short distances, they rely more on camouflage than speed for protection. Their first line of defense is their mottled brown body coloration that helps hide them against bare soil and dead

leaves. For further camouflage, local populations tend to resemble the color of their area's soil. Populations in areas of sandy soil may have a yellowish tint while populations in other areas may have a reddish or dark brown tint. The body shape is also an adaptation to avoid the attention of would-be predators. When lying against the soil, the flattened body casts only a slight shadow, and the spines on the back and sides help break up the body's outline. A motionless horned lizard is difficult to see against bare soil.

#### Life of the Horned Lizard

Texas horned lizards feed on a variety of ground-dwelling arthropods such as beetles and spiders, but harvester ants (red ants) are their primary prey, comprising 90 percent or more of their diet. These relatively large ants are seedeaters and live in prairies, woodland margins and shrublands with abundant grasses and forbs. Texas horned lizards lie motionless along harvester ant trails and capture ants as they pass to and from their colony. When an ant approaches, the lizard takes a few quick steps forward, flicks out its tongue, captures its prey and swallows it whole. Behavioral observations have shown that horned lizards may eat as many as 70 harvester ants a day! Horned lizards usually attack solitary ants several yards away from the harvester ant colony, and avoid the colony's center where they would be mobbed by droves of biting ants.

Horned lizards obtain most of the water they need from the ants they eat or by licking dew off vegetation. During light rains, horned lizards may drink the water that collects on their bodies by arching their backs and causing the rainwater to flow forward toward the mouth. Like most reptiles, horned lizards are adapted to conserve body water. Their kidneys excrete wastes and excess salts in the form of uric acid, a semi-solid substance containing very little water, and their bodies' scales protect the underlying skin from drying and losing moisture.

Texas horned lizards emerge from hibernation between late March and mid-April. They seem to be most active at temperatures between 80-



90° F, and during the morning hours they spend much of their time, lying in exposed, sunny locations to raise their body temperature. Most of their hunting is done between late morning and dusk, but on the hottest days of summer they may be active only during the morning and spend the afternoon buried just beneath the soil or under the shelter of vegetation. In October they burrow underground to begin their winter hibernation.

Courtship and mating take place in late May and June. Courtship consists of a rapid head bobbing display by the male, which is followed by head nodding from the female. One to two weeks after mating, the female digs a slanted tunnel approximately 6 to 8 inches into the ground. She then lays a clutch of 8 to 30 eggs--each about the size and shape of a small jelly bean. After laying her eggs, the female places dirt back into the tunnel and scratches the ground around the entrance to hide its presence. The female provides no further care for her eggs or young and is not likely to lay more eggs that year. The eggs incubate for approximately two months, then hatch in August or September. When the young emerge, they look like miniature versions of the adults, about 1 1/8 to 1 1/4 inches long.

### Finding Horned Lizards

The Texas horned lizard was historically found in scattered locations across Oklahoma (except the extreme southeast) as well as adjacent portions of Texas, Kansas and Missouri. Many people associate this species with an arid environment, sandy soils and sparse vegetation. While horned lizards can thrive in this environment, they are adaptable to a wide range of conditions, the abundance of harvester ants appearing to be one of the most important factors determining their distribution. As a general trend, horned lizards seem to be most common in habitats with healthy harvester ant populations, sandy or loamy soils, and moderate grass or shrub cover. As long as harvester ants and some ground vegetation are present for food and cover, they

may be found on short and mid-grass prairies, along woodland edges and around low thickets of scrubby oaks and sand plums. Horned lizards appear to avoid areas of tall, dense grass and deep woods.

### WANTED: Horned Lizard Researchers

The Texas horned lizard is familiar to most Oklahomans, yet rarely has it been studied in detail, leaving many unanswered questions about its biology. We hope you will help us in the study of the Texas horned lizard. If you see one, please take a few minutes to record your observations on this form and return it to: Oklahoma Wildlife Diversity Program, PO BOX 53465, Oklahoma City, OK 73152. Your assistance can help us all to better understand this fascinating animal.

The form is titled "TEXAS HORNED LIZARD SIGHTING REPORT FORM" and contains the following fields:

- Date of Sighting: \_\_\_\_\_
- Number Lizards Seen: \_\_\_\_\_ Adults \_\_\_\_\_ Juveniles
- Spines present on head and sides? \_\_\_\_\_ Yes \_\_\_\_\_ No
- Horned lizards seen here in the past? \_\_\_\_\_ Yes \_\_\_\_\_ No
- If yes, how many years? \_\_\_\_\_
- Were harvester ants present? \_\_\_\_\_ Yes \_\_\_\_\_ No
- Soil Type (circle those that apply): \_\_\_\_\_
- Sand \_\_\_\_\_ Silt \_\_\_\_\_ Clay \_\_\_\_\_ Gravel \_\_\_\_\_
- County: \_\_\_\_\_
- Distance from nearest town / Legal Description (example: 2 miles east, 3 miles south of town X): \_\_\_\_\_
- Habitat description where lizard found (example: grazed pasture with scattered mesquite trees): \_\_\_\_\_
- Other Information: \_\_\_\_\_
- Name (optional): \_\_\_\_\_
- Address (optional): \_\_\_\_\_

### Where have all the Horned Lizards Gone?

The Texas horned lizard remains common in parts of western Oklahoma, but has shown a dramatic decline in both range and population size in the eastern and central parts of the state since the 1960s. Several possible reasons have been proposed for the decline, but little evidence exists to determine

the true causes. The horned lizard's decline is most likely the result of a combination of factors with the importance of each factor varying from one part of the state to the next.

Increased use of pesticides may have reduced the harvester ant population in some areas, thus reducing the horned lizard's main food supply. In agricultural areas, ants are rarely considered pest species but may be killed by insecticides used against other insects. Also, herbicides used to eliminate weeds may affect harvester ant populations by reducing the abundance or quality of seeds on which the ants feed. In residential areas, ants often are poisoned by people fearing ant bites or wanting to keep them away from stored food. Because harvester ant colonies are easily visible, these harmless ants often are destroyed.

Prolonged periods of hot, dry weather associated with extreme drought may cause harvester ants to go dormant and temporarily eliminate the lizard's most important food source. A severe drought hit Oklahoma in the early 1980s and may have caused some of the decline.

Because horned lizards may lie on roads to bask on the warm pavement or gravel, they are vulnerable to vehicle kills. As the number of roads and vehicles increase, the probability that horned lizards will be hit and killed increases.

In some areas, the number of potential predators on horned lizards may be higher now than in the past. Though little evidence has measured the effect of predation on horned lizard populations, increased populations of possible predators such as feral cats, cattle egrets and great-tailed grackles have been suggested in recent years, especially around towns and pastures.

The collection of horned lizards as pets or to sell commercially in the pet trade may have affected some populations, especially near towns and cities. Anecdotal accounts state that thousands of horned lizards were shipped out of Oklahoma and Texas and sold for pets in the eastern U.S. and Europe from the early 1900s until the 1980s. Because of

their special diet, most of these lizards died from improper care within a few weeks, and no self-sustaining captive-bred populations were ever developed. Horned lizards now are protected in Oklahoma and Texas and this activity is illegal; however, where collecting was common, some populations may not have recovered yet.

As native habitats are modified by human development, some of this land may no longer be suitable for horned lizards or their harvester ant prey. With less suitable habitat, fewer lizards can be supported. Also, as the amount of habitat declines, the remaining patches of good habitat become more isolated from each other. Because of their small size and limited ability to travel long distances, horned lizards have difficulty moving between widely spaced habitat patches. Populations in isolated habitats are more susceptible to local extinction from catastrophic events, and once an isolated population is gone, it is difficult for other horned lizards to resettle the area.

### **Crying "Bloody" Tears**

Horned lizards are known to squirt a thin stream of blood from the corners of their eyes when they are handled or disturbed. This does not appear to be a defense mechanism, but an uncontrollable reaction when frightened. During hot weather, horned lizards cool their bodies by increasing the flow of blood just below the skin to help disperse body heat. If a warm lizard is disturbed or excited, its blood pressure may increase and blood lying in the sinuses behind each eye is uncontrollably forced out to relieve pressure.

### **Oklahoma's Reptile Regulations**

The Texas horned lizard is classified as a "Species of Special Concern." In 1992, Oklahoma regulations established a year-round closed season on these lizards and 20 other rare reptile and amphibian species. It is unlawful to kill, capture, keep as pets or sell Texas horned lizards without specific written permission. While the Texas horned

lizard is not an endangered or threatened species, its widespread decline has caused concern for its future status. The closed season is designed to protect it from unnecessary collection.

### **Additional Information Sources on Horned Lizards**

Collins, J.T. 1994. Amphibians and Reptiles of Kansas. University of Kansas Publications.

Sievert, G. and L. Sievert. 1993. A Field Guide to the Reptiles of Oklahoma. Oklahoma Department of Wildlife Conservation. Available from the Wildlife Diversity program for \$5 (\$4 + \$1 p&h).

Sherbrooke, W.C. 1981. Horned Lizards, Unique Reptiles of Western North America. Southwest Parks and Monuments Association.