



# MANAGEMENT AND MONITORING PACKET

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## WHAT'S HAPPENED TO ALL THE HORNY TOADS?

Everyone loves horny toads, but for many Texans, the fierce-looking, yet amiable, reptiles are only a fond childhood memory. Once common throughout most of the state, horned lizards have disappeared from many parts of their former range.

A statewide survey conducted by the Horned Lizard Conservation Society in 1992 confirmed many Texans' personal experiences—in the latter part of the 20th century the Texas Horned Lizard nearly disappeared from the eastern third of Texas and many respondents reported that horned lizards were increasingly rare in Central and North Texas. Only in West and South Texas do populations seem somewhat stable.

Many factors have been proposed as culprits in the disappearance of horned lizards, often fondly called “horny toads,” including collection for the pet trade, spread of the red imported fire ant, changes in agricultural land use, habitat loss and fragmentation as a result of urbanization, and environmental contaminants. For the most part, however, the decline of horned lizards has remained a mystery with little understanding of management actions that could be taken to reverse it. Even less is known about the status of our other two horned lizard species—the Round-tailed Horned Lizard and the Greater Short-horned Lizard.

But you can help! Through participation in Texas Horned Lizard Watch as a citizen scientist, you can collect data and observations about the presence or absence of horned lizards and habitat characteristics on your monitoring site. The data you provide to TPWD, *even if you don't find horned lizards*, will help us understand how they are doing and offer some insights for people wishing to manage habitats for horned lizards. If you are a property owner, then keeping these management guidelines in mind can help you to enhance or perhaps even recruit horned lizard populations on your property, while at the same time benefitting other native wildlife. There's something everyone can do to help out horny toads!

*Texas Horned Lizard*



NATALIE SEGHERS

*Round-tailed Horned Lizard*



DANIEL MARTIN

*Greater Short-horned Lizard*



DANIEL MARTIN

## ABOUT HORNED LIZARDS

### Appearance

Horned lizards are named for the crown of horns found on their heads, the size and number of which vary among species. Although often called horned toads, horny toads, or even horned frogs because of their wide, flattened bodies (their scientific name *Phrynosoma* actually means “toad-body”), they are not amphibians like other toads, but are reptiles with scales, claws and young produced on land. More than a dozen different species of horned lizards are found throughout western North America.

Three horned lizard species call Texas home, with the most widespread being the Texas Horned Lizard, or the familiar “horny toad.” The geographic range of these species can overlap in West Texas, but they can each be readily distinguished from each other by the following characteristics.



LEE ANN LINAM



DANIEL MARTIN



DANIEL MARTIN

#### Texas Horned Lizard

*Phrynosoma cornutum*

**Horns** – two prominent horns at the rear and center of the skull



**Scales** – two rows of spiky fringe scales on the side of the body

**Coloring** – gray to brown to rust, with dark spots in rows down the back, a light central stripe, and dark lines radiating from the eye.

**Length** – 3.5 to 5 inches

**Range** – most of Texas, though now nearly gone from the eastern third

#### Round-tailed Horned Lizard

*Phrynosoma modestum*

**Horns** – four horns of medium length lined up on the back of the head



**Scales** – few enlarged scales on the body, sides without spiky fringe

**Coloring** – white to gray, brown or pink, with dark blotches at the legs and neck; bands on tail

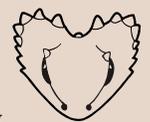
**Length** – 3 to 4 inches

**Range** – rocky areas in the western third of Texas

#### Greater Short-horned Lizard

*Phrynosoma hernandesi*

**Horns** – robust head that is wider than long and heart-shaped, back of the head is tipped only with small horns



**Scales** – one row of spiky fringe scales along the side of the body

**Coloring** – variable colors and patterns ranging from simple brown or grey to intricate patterns of bright colors including orange, yellow, white, red, blue and green

**Length** – 3.5 to 6 inches

**Range** – only higher elevations, in the forests of the Davis and Guadalupe mountains of West Texas



TERRY HIBBITTS

## TEXAS SPINY LIZARD

Another similar group of lizards occurs in Texas, the spiny lizards. Spiny lizards are sometimes confused with horned lizards because of the spiky scales found on their bodies and heads; however, the spiny lizards are much more slender with a longer tail. In addition, they tend to spend more time climbing, whereas horned lizards spend most of their time on the ground.

## Life History

Horned lizards are usually found in flat, open terrain, with sparse plant cover, although in the eastern portion of their distribution, vegetation cover may be somewhat thicker. They utilize mammal burrows, rock piles or clumps of vegetation for cover and may excavate shallow burrows in loose soils or scoop out a shallow depression in which to hide.

Horned lizards primarily eat harvester ants (also called big red ants), but their diet also includes termites, other native ants, other insects, spiders and sowbugs. Horned lizards or their droppings can sometimes be found near the beds of harvester ants, and an individual can consume 70–100 ants per day (one reason they are difficult to maintain in captivity!).

Horned lizards require warm temperatures to stimulate their appetite and activity. They sometimes begin their day by exposing only their heads to sunlight while keeping their bodies buried. Later, they will often be seen in a flattened body posture sunning themselves in open areas. They are not usually active at night or when temperatures fall below 75° F. In general, they are seen only in late spring through early fall and tend to hiber-

nate a few inches underground from September/October to March/April.

Mating occurs soon after emergence from hibernation. The female digs a hole 6 to 8 inches deep and lays 13 to 50 eggs (6 to 18 for Round-tailed Horned Lizards), which are incubated by the warmth of the soil. Depending on ground temperatures, young horned lizards about 3/4-inch in length may begin to hatch 5 to 9 weeks later. The Greater Short-horned Lizard, which lives in cooler, higher-altitude climates, is unique among our species in giving birth to live young!

Texas Horned Lizards and Short-horned Lizards may live 5 to 8 years, while Round-tailed Horned Lizards are thought to live only 2 to 3 years. Although snakes, mammals and birds prey on them, horned lizards have developed some unique defenses.

Their spiky appearance and coloration help Texas and Short-horned lizards to blend into the local vegetation, while the color and shape of the Round-tailed Horned Lizard actually help it to look like a rock! In addition to the deterrence that the horns on the head may provide to predators, horned lizards can inflate themselves to a larger apparent size or may tilt their body to appear larger. Finally, the horned lizard is renowned for its ability to shoot

## WHAT ARE HARVESTER ANTS?

Harvester ants belong to the genera *Pogonomyrmex* or *Ephebomyrmex*. Twelve species of harvester ants are found in Texas, and the Red Harvester Ant (*Pogonomyrmex barbatus*) is the most widespread. Red harvester ants are easily identified by their large size (up to a half inch) and generally conspicuous mound. These ants clear vegetation, forming a large circular pattern of bare ground around their nest. This bare ground is often covered with small pebbles dug from within the nest itself. The mound usually has one main entrance/exit hole in the center of the cleared area. Extending in various directions from the main mound are foraging trails leading to various foraging zones. Harvesters, as the name implies, harvest seeds. Grass seeds make up the majority of their diet, and the husks of harvested seeds often surround harvester ant mounds.



ANN MAYO

LEE ANN LINAM

a stream of blood from its eye when under extreme stress (actually from ruptured blood vessels in the sinuses near the eyes). A chemical in the blood is especially distasteful to canine predators. Texas Horned Lizards and Short-horned Lizards are known to engage in blood-squirting, while the Round-tailed Horned Lizard does not.

Sometimes a horned lizard sign such as scat (or droppings) is much more visible than the species itself. Horned lizard scat is a dark brown oblong pellet that is straight or slightly curved. A white uric acid tip is often very promi-

ROLLO NEWSOM



nent. Ant heads and other body parts are noticeable in the scat, especially when the scat is broken apart. The scat

usually looks very large in relation to the lizard from which it came, ranging from 1/2 to 1-1/2 inches in length and 1/4 to 3/8 inch in diameter. Scat of other lizards have the uric acid tip; however, the shape of the scat is much less symmetrical and it will not contain a high percentage of ants.

## Protected Status

Texans have a long history of concern for horned lizards. In 1967, the state legislature protected Texas Horned Lizards from the pet trade (horned lizards do not survive well in captivity), and in 1977, Texas Parks and Wildlife Department placed both the Texas Horned Lizard and the Greater Short-horned Lizard on the state threatened species list. In 1993, a group of schoolchildren successfully petitioned the Texas Legislature to name the Texas Horned Lizard the official state reptile. Though not listed as threatened or endangered, Round-tailed Horned Lizards receive some attention/regulation through the state's nongame permit process.

## Horned Lizard Range Map



■ Texas Horned Lizard

▨ Round-tailed Horned Lizard

■ Short-horned Lizard

# MANAGEMENT OF HORNED LIZARDS

Many Texans are interested in having more horned lizards on their property. Although many people inquire about relocating or breeding horned lizards for release, unfortunately, initial research has not been very successful with these efforts and additional conservation questions need to be answered. In addition, because Texas Horned Lizards and Short-horned Lizards are listed as threatened species, anyone handling these species or attempting to do this must obtain a scientific permit. Horned lizards cannot survive and thrive without appropriate habitat, and probably the best strategy for bringing back horned lizards is to first restore or create suitable habitat that can support and conserve native ant populations as well as horned lizards.

Horned lizards in Texas can be found in a variety of habitats; however, researchers have noted several similarities among occupied habitat.

- First, horned lizards tend to be found in “patchy” habitat that is characterized by areas of bare ground (~40 percent) interspersed with native vegetation. This open ground allows horned lizards room for movement and basking, and it provides ants open areas for colony establishment.

- Second, Texas Horned Lizards seem to prefer sandy loam soils that are more than 2/3 sand and less than 15 percent clay. Loose, well-drained soils are more suitable for burrowing, hibernating and nesting.

- Third, horned lizards in Texas are usually found where native ants are abundant. Harvester (or “red”) ants in the genus *Pogonomyrmex* are often very evident, although horned lizards also eat other native ants and insects.

One horned lizard can use five to six acres of habitat over the course of its activities, often feeding at a number of different harvester ant mounds. There is a minimal amount of overlap with other adult horned lizards. A viable population of horned lizards may thus require a substantial amount of suitable habitat.



## MANAGEMENT GUIDELINES

The following management guidelines for horned lizards are adapted from a 1998 publication, *Management of Texas Horned Lizards*, written by Scott E. Henke and Wm. Scott Fair, and published by the Caesar Kleberg Wildlife Research Institute of Texas A&M University–Kingsville as Wildlife Management Bulletin No. 2.

**1. Develop and maintain a habitat that contains a diversity of native plant species –**

A diverse community of native plants will attract a diverse community of invertebrates. Such a variety of insects may be especially important to juvenile horned lizards. If you are interested in reclaiming a previous agricultural area or in landscaping at your residence, focus on native bunchgrasses, such as bluestems, forbs and shrubs. Bunchgrasses form clumps that allow horned lizards to easily move among the grass clumps; whereas carpet grasses form a thick mat that can impede horned lizard movement. Native grasses also produce seeds that are good food sources for harvester ants.

**2. Create a mosaic habitat of open areas intermixed within more dense cover –**

Such a patchy environment will give horned lizards areas in which to warm or cool them-

selves, allow them room for movement, and offer sufficient escape cover from predators. You may also wish to create 1-square-yard areas devoid of any vegetation and ground litter. These spots may serve as valuable basking areas for horned lizards, and newly fertilized harvester ant queens need bare ground in which to establish new colonies. Grazing, burning, mowing, and scraping can help create and maintain the mosaic habitat desired.

**3. Use prescribed fires to remove ground litter –**

Horned lizards usually avoid areas with substantial dead vegetation on the ground (also called litter) because the litter can impede their movement. Burning is a useful tool to decrease ground litter and create open ground. Burning in small patches on a rotational basis, so that not every patch is burned every year, can allow horned lizards some areas to escape. In addi-

tion, conducting burns during the cool season (late winter/early spring) results in cooler fires, and research suggests that hibernating lizards can survive such fires while burrowed underground. Local Natural Resource Conservation Service staff can provide site-specific guidance on prescribed burning.

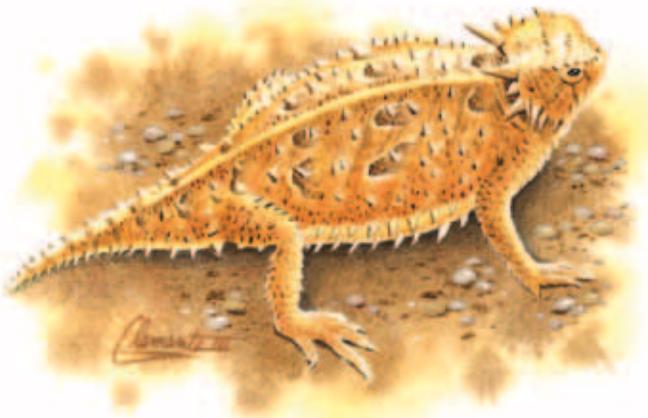
4. **Avoid overgrazing by livestock** – Horned lizards do not appear to be negatively affected by low to moderate grazing of livestock, and grazing may help increase some plant diversity and open areas. On the other hand, very heavy stocking rates can reduce needed cover and result in direct mortality of horned lizards. Use of a rotational grazing scheme can help create the desired mosaic of open areas and vegetative cover.
5. **Avoid road maintenance and limit traffic during the horned lizard active season** – Horned lizards make frequent use of roadsides, especially unpaved secondary roads, for basking, resting, and bedding sites. If possible, avoid disking or grading roads between mid-March and mid-October. In addition, vehicular strikes can be a significant mortality factor for horned lizards. Slower speeds and caution should be exhibited during the active season for horned lizards, especially in the mornings and late afternoons. If drivers are cautious, however, road-cruising can be a valuable way to survey horned lizard populations.
6. **Avoid the use of broadcast pesticides** – Pesticides could kill horned lizards directly by accumulating toxins within their body or indirectly by killing harvester ants and other valuable

insects. If pesticides are needed, then spot treatment is recommended rather than broadcast application.

7. **Manage ant populations** – Findings from Texas Horned Lizard Watch indicate that efforts should be made to encourage native ant populations and discourage red imported fire ants. The first step should be to reduce red imported fire ant populations; however, fire ant control methods should be chosen carefully, as some pesticides used to kill fire ants can also kill native ants and other insects. In a small area, individual fire ant mound treatments, either with pesticides, organic mixes or soapy boiling water, can be used. When baits are used, application late in the day on the fire ant mound can increase the chances that fire ants will pick up bait and native ants will not. On larger acreages or with severe infestations, a broadcast treatment may be needed; however, steps can be taken to minimize the impact of such treatments on native ants. Try to find a bait that uses an active ingredient, such as Spinosad, that does not affect harvester ants. Several researchers suggest placing broadcast pesticides in small containers, such as film canisters that have small holes drilled in the container or its lid. The holes should be no larger than 1/16-inch in diameter so that fire ants can enter the container, but harvester ants cannot.

As noted above, native ants can be encouraged by establishing native grasses and scattered patches of bare ground. Some landowners also choose to “feed” their harvester ant populations by providing native seed, oat flakes, crushed peanuts, or similar items within the foraging area of the mound.

8. **Remove feral domesticated predators** – Feral cats and dogs, along with pets, are predators of horned lizards. Keep pets from “hunting” in horned lizard habitat. Feral animals can be removed; you may wish to contact the Humane Society for assistance or suggestions. Keep in mind that wild avian predators, such as road-runners or shrikes, are protected by federal law and cannot be killed or trapped; however, providing plenty of escape cover can help horned lizards survive among these natural predators.



# HOW TO MONITOR HORNED LIZARDS

There are two ways you can participate in Texas Horned Lizard Watch, either by searching a site or setting up a transect. Please note that each survey type has its own unique data form.

## Site Surveys

Site surveys can take place anywhere, from your backyard to your hunting ranch to your favorite state park. The enclosed data sheet asks you to provide information about the site location and its habitat and then provides a table where you can list information about each horned lizard (or horned lizard scat) seen. Feel free to submit maps or photos to supplement your information and to make copies of the data sheet if needed. You can survey as many different sites as you like; simply fill out a separate site form for each site.

For best results, we recommend that you visit your site at least five times between May and September; however, we are happy to accept data from sites that you visit less often. You can even fill out this form when you happen to spot a horned lizard by chance. Simply let us know how many hours you spent visiting the site, so that we can get an idea of the survey effort.

## Transects

Transects are a more quantitative method for monitoring species and require a more formal survey effort. The benefits of transects are that we can convert results to density estimates and thus compare horned lizard populations at different sites.

To conduct a Texas Horned Lizard transect you need to set up a route that is at least 3 miles long. The route can follow unpaved roads or trails or be of your own design. Walk, ride or drive the route, recording all Texas horned lizards and ant beds that occur within 3 feet of your route on either side. (If driving, be sure to keep speeds

under 15 mph and stop and check the identification of any horned lizards seen.) Mark your transect location on a map if possible. Transects should be conducted at least five times between May and September if possible.

## Submitting Data

Data forms can be mailed, faxed, or scanned and e-mailed. We would like to receive your datasheet *even if you do not see horned lizards*. Not finding horned lizards is as important as finding them, because that helps us understand the types of sites or conditions where horned lizards are missing.

## Additional Monitoring Notes

Certain conditions apply to both methods. You should try to make sure that your surveys are conducted under sunny, or partly sunny, dry weather conditions when temperatures are 80-95° F and winds are light or moderate. One good indicator of horned lizard activity is to check to see whether harvester ants are active. Ideally, your five survey efforts should be at least several weeks apart (although you may conduct additional surveys more frequently). If you do visit a site more frequently, then you may want to collect any horned lizard scat you encounter so that you don't recount it on subsequent visits. Scat can also be sent in with your data sheets as verification.

The Texas Horned Lizard and the Short-horned Lizard are listed as threatened by Texas Parks and Wildlife, primarily to protect them from commercial exploitation. Because of this designation, you should not

## IMPORTANT!

### ABOUT THE LANDOWNER ACCESS REQUEST FORM

Texas Parks and Wildlife cannot use data collected from private land unless written permission is received from the landowner.

All Texas Horned Lizard Watch volunteers must send in a completed Landowner Access Request Form for any data collected from private land. This applies even if you are monitoring your own property.

Please respect the rights of private property owners during the course of your volunteer efforts.

collect or move horned lizards that you encounter on your survey efforts.

Finally, be sure to send in your survey forms, even if you do not see any horned lizards. If you have any uncertainty about identification of the lizards or scat you see, don't hesitate to take a photo and send it to us.



Texas Horned Lizard Watch

Landowner Access Request Form

To the landowner:

\_\_\_\_\_ (volunteer name) is participating as a volunteer in Texas Horned Lizard Watch. Texas Horned Lizard Watch is a monitoring program that uses citizen volunteers to gather data about the status and health of our state reptile. Texas Parks and Wildlife is very pleased to have the assistance of concerned Texans in watching over the health of the horny toad.

We have, however, instructed our volunteers that they cannot collect data on private land without the approval of the private landowner. Accordingly, we have prepared this form for your approval. The sections described below are the releases that we and our volunteers are required to obtain from you under Section 12.103 of the Texas Parks and Wildlife Code. If you are willing, then please sign one or both sections and provide a copy to our volunteer.

1. Use of information

This documents my approval for TPWD volunteers and employees to use site-specific information from the property I own or manage. This may include placing that information onto a topographic map and entering the information into a department database. Thus, the information could be viewed by the public.

\_\_\_\_\_ (Landowner or authorized agent signature) \_\_\_\_\_ (Date)

2. Reporting information

This also documents my approval for TPWD volunteers and employees to report (such as in publications or technical reports) the above approved information in a manner that permits identification of the location of the specific parcel of property that I own or manage.

\_\_\_\_\_ (Landowner or authorized agent signature) \_\_\_\_\_ (Date)

3. Other Conditions

If there are any conditions that apply to this approval, please specify and initial below.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Name and Address: (of landowner or authorized agent)

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City/ST/Zip \_\_\_\_\_  
Phone \_\_\_\_\_  
Phone \_\_\_\_\_

Optional:

Ranch or Tract Name \_\_\_\_\_  
\_\_\_\_\_  
County \_\_\_\_\_  
Acreage \_\_\_\_\_  
Location \_\_\_\_\_



**Texas Horned Lizard Watch**  
**Site Survey Data Form**

Complete a separate data form for each site

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Phone \_\_\_\_\_  
 E-mail \_\_\_\_\_

Site Name \_\_\_\_\_  
 County \_\_\_\_\_  
 Lat-Long or distance and direction from nearest town \_\_\_\_\_

*Please mark location on map if available.*

Approximate area of site \_\_\_\_\_ acre(s)  
 Are harvester ants present?  Yes  No  
 Are red imported fire ants present?  Yes  No

**Dominant habitat type**

- native grassland (n)
- improved grasses (i)
- mixed grass/shrubs (m)
- predominantly shrubland (s)
- woodland/forest (w)
- desert scrub (d)
- agriculture (a)

**Dominant land use**

- residential
- ranching
- agriculture
- park land/preserve
- not in current use

**Dominant soil type**

- rocky
- sandy
- clay
- loam (intermediate between sand/clay)

Approximate time (# people X # hours) spent searching this site this year: \_\_\_\_\_

**Horned Lizard Sightings (includes scat)**

Date	Time	Temp (F)	HL species <sup>1</sup>	Approximate size (in.)	# HL scat (droppings) seen	Habitat <sup>2</sup>	Comments

<sup>1</sup>Indicate whether lizard was a Texas Horned Lizard (TLH), Round-tailed Horned Lizard (RTHL) or Short-horned Lizard (SHL).  
<sup>2</sup>Indicate the habitat type where the lizard was seen (based on habitat types listed above).

Continue on additional pages if needed.

Send completed form(s) and map to:  
**Please submit all forms by October 31**

Texas Horned Lizard Watch, Texas Parks and Wildlife Dept.  
 4200 Smith School Road, Austin, TX 78744  
 hornedlizards@tpwd.state.tx.us



**Texas Horned Lizard Watch**  
**Transect Data Form**

Complete a separate data form for each transect

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Phone \_\_\_\_\_  
 E-mail \_\_\_\_\_

Transect name \_\_\_\_\_  
 County \_\_\_\_\_  
 Lat-Long or distance and direction from nearest town \_\_\_\_\_  
 \_\_\_\_\_

*Please mark location on map if available.*

Length of transect \_\_\_\_\_ miles  
 Transect was:  walked  driven  other  
 Maximum number of harvester ant beds \_\_\_\_\_  
 Maximum number of fire ant beds \_\_\_\_\_

**Dominant habitat type**

- native grassland (n)
- improved grasses (i)
- mixed grass/shrubs (m)
- predominantly shrubland (s)
- woodland/forest (w)
- desert scrub (d)
- agriculture (a)

**Dominant land use**

- residential
- ranching
- agriculture
- park land/preserve
- not in current use
- road right-of-way

**Dominant soil type**

- rocky
- sandy
- clay
- loam (intermediate between sand/clay)

Approximate time (# people X # hours) spent searching this transect this year: \_\_\_\_\_

**Horned Lizard Sightings (includes scat)**

Date	Time	Temp (F)	HL species <sup>1</sup>	Approximate size (in.)	# HL scat (droppings) seen	Habitat <sup>2</sup>	Comments

<sup>1</sup>Indicate whether lizard was a Texas Horned Lizard (TLH), Round-tailed Horned Lizard (RTHL) or Short-horned Lizard (SHL).  
<sup>2</sup>Indicate the habitat type where the lizard was seen (based on habitat types listed above).

Continue on additional pages if needed.

Send completed form(s) and map to:  
**Please submit all forms by October 31**

Texas Horned Lizard Watch, Texas Parks and Wildlife Dept.  
 4200 Smith School Road, Austin, TX 78744  
 hornedlizards@tpwd.state.tx.us

# NOW GET OUT THERE AND COUNT YOUR HORNY TOADS!



## If you have questions or need more information:

Texas Horned Lizard Watch, 4200 Smith School Road, Austin, TX 78744

[hornedlizards@tpwd.state.tx.us](mailto:hornedlizards@tpwd.state.tx.us)

[www.tpwd.state.tx.us/hornytoads/](http://www.tpwd.state.tx.us/hornytoads/)

## NONGAME AND ENDANGERED SPECIES CONSERVATION FUND

The "Special Fund" was created by the Texas Legislature in 1983 to underwrite the conservation and management work performed on Texas' nongame and endangered wildlife. This fund, sustained entirely by voluntary contributions, has provided support for a variety of projects benefiting nongame and endangered species. For more information on this fund, call the TPWD Wildlife Diversity program at (800) 792-1112.



Texas conservation license plates help fund conservation efforts in the state. The most popular plate features a Texas horned lizard and provides funding for wildlife diversity projects, including horned lizard research. <http://conservation-plate.org/>

## FOR MORE INFORMATION CHECK OUT THE FOLLOWING REFERENCES

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**TEXAS**  
**PARKS &**  
**WILDLIFE**

PWD BK W7000-038 (2/10)

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