



TEXAS
**NATURE
TRACKERS**

Wildlife Diversity Program
4200 Smith School Road, Austin, Texas 78744
www.tpwd.state.tx.us/tracker

The Texas Nature Tracker

TEXAS
PARKS &
WILDLIFE

2007

Catching Up!

with

Marsha E. May, TNT Coordinator

In 1992, Texas Parks and Wildlife developed Texas Nature Trackers, a citizen science monitoring effort designed to involve volunteers of all ages and interest levels in gathering scientific data on species of concern. It is hard to believe that it has been 15 years!

The first watch program was Texas Monarch Watch in 1993. Then there was Texas Hummingbird Round-up in 1994, followed by Texas Horned Lizard Watch and Texas Mussel Watch in 1997, Texas Amphibian Watch in 1999 and, most recently, the Box Turtle Survey and Texas Black-tailed Prairie Dog Watch in 2005. There also are many volunteers involved in a few unique projects that enable individuals or groups to "adopt" specific populations of rare species, such as the Friends of *Streptanthus*, who are monitoring and working to conserve populations of the rare Bracted Twistflower.

Thousands of volunteers have participated in Texas Nature Tracker programs throughout the years, and we are so grateful for all of your contributions. Data collected from these programs give us a better understanding about the trends and management needs of these important species throughout Texas. New projects are in the horizon, so keep an eye on our Web site: www.tpwd.state.tx.us/trackers.

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Prairie Dogs Reintroduced to Maddin Prairie Preserve

Pat Merkord, Secretary, Native Prairies Association of Texas

On a hot day at the end of May, members of the Native Prairies Association of Texas (NPAT) traveled to Maddin Prairie Preserve (owned by the association) to participate in the reintroduction of black-tailed prairie dogs saved from a development site in Abilene.

The initiator of this project was Jesse Wood, an NPAT member and a native of Abilene who was looking for a place to relocate the prairie dogs. Jesse has been moving and saving prairie dogs from destruction for many years. On the appointed day of arrival, the Prairie Dog Rescue Team, Bill and Deana Wagner of Amarillo, arrived with a truckload of prairie dogs in wire cages. Each cage of prairie dogs was set over an artificial burrow that had been prepared by Jesse prior to arrival of the dogs.

The restoration site sits on a flat-topped hill that overlooks the surrounding area. NPAT members, Jesse Wood, the Rescue Team and local biology teacher Allison Hayes, all helped in the relocation. Board directors Jason Spangler and Marcia Herman, and members Coby Dinges, Lisa Spangler and Glenn Merkord set up a hot-wire fence around the perimeter to help deter predators, and other members secured hog fencing over the artificial burrows. A total of 89 prairie dogs would be released.

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Catching up ...

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Thirteen Texas Master Naturalist chapters and Nature Centers participated in one or both Texas Amphibian and Mussel Watch Train the Trainer workshops. These Texas Nature Tracker partnerships provide an effective way of spreading this wealth of information to your communities. Your efforts allow the availability of Texas Amphibian and Mussel Watch to more Texas citizens than ever before. Please let us know if there is anything that we can do to help with future workshops. We really appreciate all that you have done.

- Rolling Plains Master Naturalist Chapter – Wichita Falls
- Capital Area Master Naturalist Chapter – Austin
- Gulf Coast Master Naturalist Chapter – Houston
- Rio Grande Valley Master Naturalist Chapter – Brownsville
- Big Country Master Naturalist Chapter – Abilene
- North Texas Master Naturalist Chapter – Dallas
- Mineola Nature Preserve – Mineola
- Forest Glenn Springs Preserve – Rosebud
- Rio Brazos Master Naturalist Chapter – Granbury
- Heart of Texas Master Naturalist Chapter – Waco
- Brazos Valley Texas Master Naturalist Chapter – Bryan
- Cibolo Nature Center – Boerne
- Big Thicket National Park – Saratoga

If you know of a Nature Center or Master Naturalist chapter that is interested in becoming a Texas Nature Tracker partner, please contact me at marsha.may@tpwd.state.tx.us. Keep that data coming!

Call for Submissions

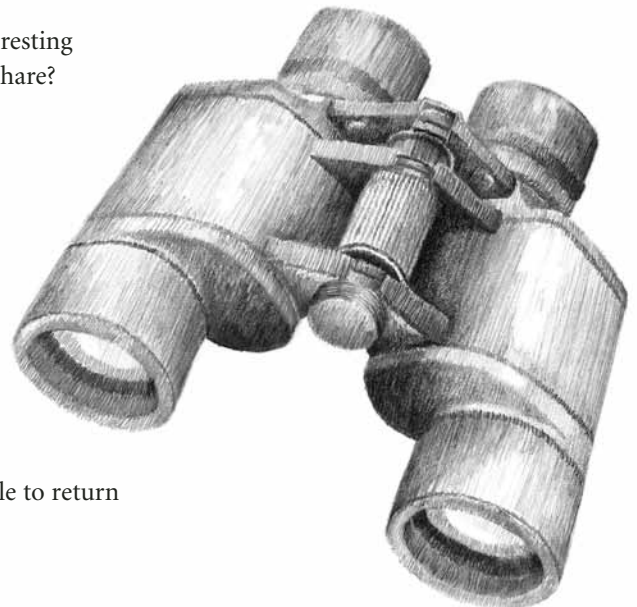
Texas Nature Trackers would like to put your story in our newsletter. There are thousands of you wonderful TNT volunteer monitors throughout Texas doing remarkable work. **WE WOULD LIKE TO HEAR FROM YOU.**

Monitors, do you have any interesting sightings, anecdotes or tips to share?

Send by e-mail to:
marsha.may@tpwd.state.tx.us

or regular mail:
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Department
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Austin, TX, 78744.

I'm sorry but we will not be able to return your submissions.





Prairie dogs ...

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The fun began when the workers tried to get the prairie dogs to enter their new burrows. The dogs were highly suspicious of the black plastic pipe tunnels, and it took quite a bit of coaxing to get them to venture into the ground. As members tempted the dogs with carrots and bits of grass, some prairie dogs managed to escape. This elicited lots of excitement and whooping as everyone raced around the site trying to capture the escapees. The whole crazy running mob of people following a zigzagging, frantic prairie dog was intently watched by a standing crowd of prairie dogs still in the cages. All the caught prairie dogs were handled with gentle loving care as they were returned to their new home sites. After several hours, most of the dogs had settled into their new burrows.

These artificial prairie dog holes were dug at a 45-degree angle about 5 feet deep with a half-cut plastic barrel placed face-down at the bottom to provide a nest. The tunnel to the nest is a black ribbed hose that is visible at the ground surface. The next morning, everyone was eager to see if the prairie dogs were settling in. Early morning observers at the site reported the dogs were going in and out of the burrows and appeared to be making themselves at home. Reluctantly, the NPAT crew left the next day and the local biology teacher, Ms. Hayes, began to monitor and send reports to board directors. The prairie dogs would have to dig new, extensive burrows and move out of their artificial ones to

have a safety network to protect themselves from predators. The chief predators of concern were badgers, coyotes and bobcats.

The following week, Allison Hayes, local monitor, reported that most of the prairie dogs had dug out of their enclosures and were building an entirely new dog town. The only sign of predators was one dead baby prairie dog and the sound of howling coyotes. Later in June, it was reported that badgers were digging into the burrows and had killed several of the dogs. In July a second batch of 62 more dogs was released to augment the original colony.

The colony continues to survive, but the threat of predators has increased with each passing month. Predator control was initiated at the outset but has not been totally effective. NPAT does not use poison control and supports live trapping and removal if possible. The survival of the prairie dogs at Maddin Prairie Preserve is a symbol of the survival of all species native to the once-vast grasslands of North America.

NPAT will continue its efforts to restore this vital ecosystem and its inhabitants.

Reprinted with permission from Pat Merkord from "The Prairie Dog," newsletter of the Native Prairies Association of Texas, Winter 2007 Vol. 20 No. 1

Texas Black-tailed Prairie Dog Monitoring

Marsha May, TNT Coordinator

Black-tailed prairie dogs (*Cynomys ludovicianus*), icons of the grasslands, were once common in short and mixed grass prairies throughout the western midwest, including Texas, Oklahoma, Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, South Dakota, North Dakota and Wyoming, as well as Canada and Mexico. Historically, black-tailed prairie dog towns covered millions of acres of Texas grasslands. Prairie dog towns in Texas now occupy less than one percent of their historic range.

Prairie dogs play an important role in the grassland ecosystem. Their digging aerates and promotes soil formation, they clip back brush and thus maintain the short grass prairie, and they are a keystone species that provides food and shelter for many grassland animals. A keystone species is one that other animals depend upon for survival.

Through participation in the Texas Black-tailed Prairie Dog Watch, you can help widen our understanding of black-tailed prairie dogs and factors contributing to their decline. The Texas Parks and Wildlife Department (TPWD) needs your help to monitor prairie dog towns in your area by observing and collecting data. The data that is collected will help TPWD biologists to monitor population trends and develop more effective conservation and management methods.

For more information, please visit the Texas Nature Tracker Web site at: www.tpwd.state.tx.us/trackers





Rolling Plains Master Naturalist Chapter's Texas Nature Tracker Partnership Happenings

Jim Miller, Master Naturalist



TEXAS HORNED LIZARD WATCH

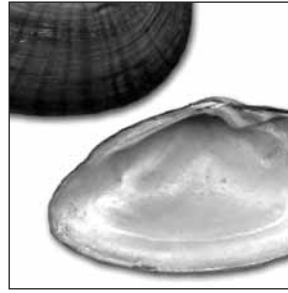
Along with armadillos and Willie Nelson, Texas horned lizards rank right up there as icons of Texas wildlife. For the 2007 season, the Rolling Plains Chapter is launching a major study of horned lizard populations and habitats in Wichita and surrounding counties.

We have put together a 12-member team, a good mix of veterans and new trainees, to take the basic Adopt-a-Habitat survey to the next level. Our initial study will focus on an undisturbed 800-acre site in Archer County where we recently confirmed the presence of Texas horned lizards. This initial site will be the basis for developing population density study protocols and procedures that we hope to share with other chapters by the 2008 season.

Our project goal is to develop a model study that can be used to establish a scientifically valid database for horned lizards. Obviously, this is not a single-season effort. We will continue to monitor and report on our initial site to record changes over time while adding new survey sites as time, resources and interest permit.

Since our team is fortunate to have a few outstanding classroom teachers, a secondary goal (still in infancy) is to develop curricula to bring awareness of horned lizards into Texas schools, summer camps and nature centers. We envision a time when we will be taking select students into the field with us as participants in our studies.

We are encouraged by the enthusiastic support our plan has received from Lee Ann Linam (TPWD), Dr. James Mueller (Tarleton State University) and the Texas Horned Lizard Conservation Society. Team members for this initial study season are Bill Setzler, Jane McGough, Leslie Fernandes, Penny Miller, Greg Mucciolo, Lila Arnold, Jana Schwarz, J.J. White, Lynn Seman, Laura Gillis, Samantha McMahan and Jim Miller.



TEXAS MUSSEL WATCH

A much wetter than typical spring temporarily delayed our hunt for freshwater mussels. Penny Miller and Laura Gillis were in the first Texas Mussel Watch training class in 2004 and continue to provide the strong backbone of the Rolling Plains Chapter's mussel program. Their efforts should be greatly augmented this season with the addition of nearly a dozen new Master Naturalists who completed Mussel Watch training as part of our spring 2007 class.

Penny Miller reports ...

We haven't started the Texas Mussel Watch yet, but have to soon with a 31 August reporting date. First it was too cold, and then the water in many places was (still is) too high. I have several dates for mussel watches on the chapter calendar, but we will probably need to add some. We usually end up with so much to do and so little time. We'll start with the places where the water depth stays fairly constant and work from there. The rivers come down pretty fast once the rain stops.

By and large, the usual mussel watchers are Laura Gillis and me. Dian Hoehne is usually very good about conducting a watch at her cabin on Lake Diversion. Last year, J.J. White, Lila Arnold and Jane McGough also went on a watch where we found two live yellow sandshells at Lake Buffalo. Also, last year we had a bumper crop of live Asian clams in a tank on a private property in Archer County. I would like to expand the number of surveyed sites, but time and human resources are always an issue. So far, we have not found any zebra mussels and, of course, would like to continue that trend.

I have always been intrigued with the animals that live in the lakes, rivers and streams, so that is why I volunteered for the mussel watch. If you have to be outside in the summer in this area of the country, mussel watching is much cooler than a lot of other things you could do. I have developed a greater appreciation for the diversity of mussels in this area. I just hope that the populations of clams other than Asian clams picks up. I think the drought a few years ago really hurt them, but who knows?

I would like to add a freshwater invertebrate survey to the mussel watch to correlate the water condition with the mussels—again, time and resources permitting.



Rolling Plains Master Naturalist, continued



TEXAS AMPHIBIAN WATCH

Silence is golden, I suppose, unless you're monitoring Texas frogs and toads. A fabulously wet spring and strong spring training class have provided bumper crops of both amphibians and watchers, yet I have heard little from our field volunteers

at this time. The cost of gasoline being what it is, most of our people are focusing on Adopt-a-Pond habitat monitoring at numerous locations in and around Wichita Falls. I'm looking forward to seeing the reports once they begin coming in.



TEXAS MONARCH WATCH

Rolling Plains Chapter members have participated in Texas Monarch Watch since the chapter first organized, and monarchs tagged by Laura Gillis during past migrations have been recovered in the wintering grounds in Mexico. This summer

chapter members are establishing patches of milkweed at River Bend Nature Center in Wichita Falls for designation as a Monarch waystation. Laura again will lead our tagging operations during the fall migration.

SUMMARY

Texas Nature Tracker programs are at the core of keeping member interest and motivation high within our chapter. Everyone can relate to butterflies and hummingbirds and work these programs from their front porch if they wish. Our older members remember a time when horned lizard encounters were a part of daily life, and they get a real charge out of introducing younger members—who have not seen horned lizards—to “the hunt.” Amphibian Watch is unsurpassed at teaching how to “observe” by listening.

Beyond the field experience itself, Texas Nature Trackers provides the foundation for our educational outreach. Field experience is directly related to presentations provided to area schools and through River Bend Nature Center.

Texas Box Turtle Survey

Marsha May, TNT Coordinator

When was the last time you saw a box turtle? Although many Texans can recall frequent encounters with box turtles in backyards, on ranches, and along roadways as kids, many Texans report that they are now hard to find. Texas Parks and Wildlife Department would like to know if you see a box turtle in the state.



Box turtles (genus *Terrapene*) can be distinguished from other native Texas turtles by having a single hinge at the front of the lower shell (plastron), allowing them to fold it up and close the front of the shell entirely; thus the common name of “box turtle.” Box turtles also have a hooked upper jaw (“beak”) that is lacking in other Texas turtles. The only other land turtle in Texas is the Texas tortoise; it lacks any hinges on the plastron, has a head entirely covered with scales rather than having skin, and has a very rough upper shell (carapace). Male box turtles have red eyes (females, yellow or golden), a longer tail with a thick base (females, shorter and thinner), and a somewhat concave plastron (females have a flat one).

You can find the sighting form at www.tpwd.state.tx.us/learning/texas_nature_trackers/box_turtle_survey/ or you can write or call us at: Texas Nature Trackers, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, (800) 792-1112, ext. 7011 and we can send you hard copies.



Bright Leaf, *Streptanthus*, and Me

Nancy Woolley, *Friends of Bright Leaf* President

Bright Leaf is a 200-plus acre natural area that is within the city limits of Austin, Texas. Located just to the north of Camp Mabry between Mopac and 360, south of 2222, the area was formerly a State Natural Area managed by the Texas Parks and Wildlife Department (TPWD). Bright Leaf is now protected and owned by the Austin Community Foundation. This area is home to the endangered Golden-cheeked Warbler and many other birds as well as several rare plants. One of the rare plants only sometimes seen at Bright Leaf is the Bracted Twistflower, *Streptanthus*

bracteatus. Several years ago, one plant was seen flowering in the area. The next year, in a different area, another was seen. Then, no flowers were seen for a couple of very dry years. This year, with so much rain, several plants were found by volunteers looking for the plant. One day, Bright Leaf may be a site of reintroduction testing for this plant. A local Boy Scout, Zack Dallas, earned his Eagle Scout award by heading up construction of a fenced area to keep deer out of a possible trial area.



PHOTO: JACKIE POOLIE

I am Nancy Woolley, president of the Friends of Bright Leaf, a volunteer group that supports Bright Leaf in many ways. A number of years ago the initial meeting of the Friends of *Streptanthus* took place at Bright Leaf. Knowing of my interest in plants, the TPWD park manager, Jeff Hershey, invited me to join the meetings. Sitting in on the meetings not only taught me a lot about the plant and how conservation work is done, but it also was a way of getting to know some other great folks that are very dedicated to the “cause.” People with TPWD, the Wildflower Center, the Lower Colorado River Authority, the City of Austin, Travis County, the U.S. Fish and Wildlife Service, Texas A&M University, and some great volunteers have all come together to work on this project. It is the commitment of these individuals that, hopefully, will make a difference for this plant. A lot of work has gone into reading some of the early studies, going into the field to find the historic locations of the plant, and conducting surveys.

“

It is the commitment of these individuals that, hopefully, will make a difference for this plant.

”

After finding populations and monitoring the sites year after year, in good years, the group carefully and judiciously collects seeds. Seeds are banked in the conservation collection at the Lady Bird Johnson Wildflower Center for eventual use in re-establishing Bracted Twistflower populations at Bright Leaf and elsewhere.

The word is spreading. This year, not only were several plants seen at Bright Leaf, but while monitoring a location on Cat Mountain, we found it was a very good year for the flower there, as well. A homeowner who lives in the Cat Mountain area saw information about the plant and realized he had seen it on his walks. He took us out to an area where we had not been monitoring. It is exciting to me that not just scientists, but plain, ordinary citizens with an interest can have input in this effort. Saving the rainforest is wonderful and necessary. I watch the shows on the Nature Channel with awe, but I believe we also can help our planet by getting involved here at home. It may not be as exotic, but I certainly hope that if I have great-great-grandchildren, they might be able to see the beauty of a Bracted Twistflower in bloom.



Streptanthus data collecting.

PHOTO: ©NANCY WOOLLEY



Streptanthus Habitat Requirements

Liz Ramsey, master's student of Ecology, Evolution and Behavior at the University of Texas at Austin

In order to bolster the *Streptanthus bracteatus* reintroduction effort, I decided to focus my master's thesis project on clarifying the habitat requirements of this rare species. I first learned about this plant from my master's advisor at the University of Texas, Dr. Norma Fowler, who was concerned with finding a way to reintroduce plants into appropriate habitat. Since prior reintroduction attempts have failed, the *Streptanthus bracteatus* recovery group became interested in identifying the habitat preferences of this species so that more appropriate reintroductions may be made. As I elected to devote my master's work to the recovery of this species, I sought to study a habitat factor of great importance.

Dr. Fowler and other members of the recovery group believe that light

availability may be particularly important for the success of *Streptanthus*. Those growing the plant in greenhouse and outdoor conditions have noted its affinity for lots of sunlight. However, the remnant outdoor populations seem to occur largely in quite shady areas, such as beneath Ashe juniper trees. These highly shaded plants appear dwarfed, restricted to only reproductive growth, and riddled with powdery mildew, which they are quite sensitive to. It is thought that *Streptanthus* might be found in woodland habitat instead of more open, unshaded areas due to deer herbivory. Prior studies on this plant species have shown that it is highly palatable to and negatively affected by deer, so it is plausible that the deer have restricted the species to areas they cannot easily reach. These shady

woodland areas may well be inappropriate habitat for *Streptanthus*; it appears to prefer more light, and shady conditions favor powdery mildew, which can certainly be a killer.

I have recently begun my experiment, which is occurring at Brackenridge Field Laboratory, a field and laboratory research station owned by the University. Greenhouse-grown potted plants were placed in a sunny location and exposed to either full sun, 50 percent shade cloth, or 50 percent sun blocking by use of an opaque wall that permits only morning or afternoon sun. If this experiment shows that *Streptanthus* prefers high light conditions over shade, reintroduction sites will need to include open grassland habitat and fencing to exclude deer.

Texas Hummingbird Roundup Looking for Volunteers

Mark Klym, Texas Hummingbird Roundup Coordinator

It was another great year for hummingbird watching in Texas in 2006, and 2007 is starting out with some real promise. Of the 18 species known from Texas, 15 were reported in 2006. There was some excitement as a possible 19th species was photographed in the Rio Grande Valley last fall, but it appears now that this bird was misidentified so we are still looking for that 19th bird.

During 2006, the coverage of the state expanded. Of the counties in the Trans-Pecos, only Hudspeth and Terrell were not represented in our returns this year. Big holes remain in the western Edwards Plateau, the High Plains and Rolling Plains, and in the South Texas Brushland as well as portions of the East Texas Pineywoods. The Coastal Plains and Central Texas were well represented. If you live in some of the counties that were unrepresented and would like to participate, you can either order a survey packet from the

office for \$6 or download the survey forms from the Web site at www.tpwd.state.tx.us/hummingbirds.



Major changes are coming on the Web site. We will be adding a page where you can view some of the data returned each year. These pages will accumulate, so that it will be possible for you to view trends both in observations and in diversity over the years. Other changes will include charts to review favored plants and other data from the answer portions of the survey. These changes are underway at this time, so you may want to visit the hummingbird roundup page occasionally over the coming months.

Pull out the field guides, find the binoculars, choose a comfortable chair, and let's enjoy the hummingbirds!



Gray Treefrog

PHOTO: ©A.R. PROUDFIT



2006 Texas Amphibian Watch— The Few, the Faithful, the Rewarded

Lee Ann Linam, Texas Nature Tracker Biologist

Texas Amphibian Watch participation fell somewhat in 2005 (perhaps the drought of 2005 made everyone forget about frogs!), but our faithful participants continued to build a strong base of information about the frogs and toads of the state. Those who were active managed to gather some data on some of our more arid-adapted species.

- Data forms were submitted to TAW by 22 volunteers, bringing the total number of participants to 60.
- Data were submitted from 25 counties, raising the total counties participating to 86.
- Data were analyzed from 18 TAW sites, raising the total number of sites monitored to 111.
- Data were collected at an additional nine sites using automated frogloggers.
- Data were collected on five roadside transects, each representing 10 sampling points.
- Data were submitted from one monitoring site for Jollyville Plateau Salamanders (*Eurycea tonkawae*).
- Data were submitted on 30 species. Texas Amphibian Watch has now collected data on 41 of the 42 extant frog species in the state. (In case you're wondering—we still need data on the Spotted Chirping Frog [*Syrrophus guttillatus*] out in West Texas!)

The most commonly-reported species were similar to previous years, except that narrowmouth toads and spadefoot toads were more widely reported than in the past. Rainfall in 2006 tended to be episodic, and our watchers must have done a good job in catching those explosive breeding choruses! In contrast, the Bullfrog (*Lithobates catesbeianus*) was less frequently reported. The most commonly-reported species in 2006 were:

- Gulf Coast Toad (*Cranopsis nebulifer*)
51 locations
- Cricket frog (*Acris crepitans*)
50 locations
- Southern Leopard Frog (*Lithobates sphenoccephalus*)
37 locations
- Green Treefrog (*Hyla cinerea*)
30 locations

- Narrowmouth toads (*Gastrophryne carolinensis* and *G. olivacea*)
29 locations

Significant findings in 2006 include a Bronze Frog with a missing eye in Liberty county that was reported to **Colette Lassberg**, one of our veteran amphibian spotters. Rio Grande Chirping Frogs (*Syrrophus cystignathoides*) continue to be reported from a wide variety of locations. They were present at most localities in Houston, **Roger Myers** documented their presence in Austin, they were found to be abundant in residential areas in College Station, and an early report from 2007 documented reproduction of young froglets in Fort Bend County. Amphibian Watchers have added greatly to our understanding of the distribution of this introduced species.

Several partners joined Texas Amphibian Watch in 2006, including the Rio Brazos Texas Master Naturalist Chapter in Glen Rose, the Heart of Texas Master Naturalist Chapter in Waco, and the Springs at Forest Glen, a nature camp in Falls County. TAW training workshops were also taught in 2006 in Austin by TNT staff, in Houston by **Jaime Gonzalez** and **Scott Kiester** (also participants in the North American Amphibian Monitoring Program), in South Texas by the Lower Rio Grande Valley TMN, and in Dallas by the North Texas TMN. Our partners have already hosted several new workshops in 2007, and several new partners have come aboard.

Several individuals continued to contribute exemplary efforts to TAW in 2006, including **Betty Bouley**, **April Proudfit** and **Kathy McCormack**. Betty collected over 80 observations in 2006. April collected data on 128 nights at her beautiful wetland location, including several nights with multiple sampling efforts. Kathy teamed with **Elizabeth Wells** to provide a very thorough sampling effort on the Balcones Canyonlands National Wildlife Refuge. Finally, 2006 represented an anniversary for two of our volunteers—**Betty Watkins** has monitored for five years in Guadalupe County, while **Sandra West**'s environmental education class at Texas State University has monitored the wetlands at Aquarena Springs for five years. Thanks to everyone for their hard work!



What's in a name?

A paper published in 2006 proposed giving several of our common Texas species a new genus name. Although these changes are not yet in widespread use, you might run into the following changes:

- Gulf Coast Toad (formerly *Bufo valliceps*; now *Cranopsis nebulifer*)
- Marine Toad (formerly *Bufo*; now *Chaunus*)
- All other toads (formerly *Bufo*; now *Anaxyrus*)
- Chirping frogs (formerly *Eleutherodactylus*; now returned to *Syrrophus*)
- Barking frog (formerly *Eleutherodactylus*; now *Craugaster*)
- All Ranids (formerly *Rana*; now *Lithobates*)

When in doubt, just give us your best description of the species and its name, and we'll make sure it goes into the correct category!!

Mussels Make Good Habitat!

Marsha E. May, Texas Nature Tracker Biologist

At the 2007 Freshwater Mollusk Conservation Society Workshop and Symposium in Little Rock, Arkansas, a paper was presented on the importance of mussels in the aquatic ecosystem. Dr. Caryn C. Vaughn spoke about the research that she and Daniel E. Spooner published in 2006. They found that where there are beds of native freshwater mussels, there also are many benthic macroinvertebrates! Benthic macroinvertebrates are very small animals without backbones (invertebrates) that live in the river bottom on rocks, logs, sediment, debris and aquatic plants during some time in their lives. These animals include crayfish, snails, worms, aquatic insects and the larvae of mayflies, damselflies and dragonflies. They play a very important role in the aquatic food chain.

Caryn C. Vaughn and Daniel E. Spooner of the Oklahoma Biological Survey and Department of Zoology, University of Oklahoma, published their work "Unionid mussels influence macroinvertebrate assemblage structure in streams" in the 2006 *Journal of the North American Benthological Society*. They compared benthic macroinvertebrate densities in mussel beds in 30 study sites and 10 patches or quadrats per study site in eight streams in Arkansas and Oklahoma. They found that macroinvertebrate densities were significantly higher in patches containing mussels than in patches without mussels. Therefore, mussel density was positively correlated with macroinvertebrate density across the 300 quadrats. Vaughn and Spooner (2006) stated that mussels probably assist macroinvertebrate production by creating biogenic structure, stabilizing stream sediments, and providing food resources.

In another study, "Context-dependent effects of freshwater mussels on stream benthic communities," which Daniel E. Spooner

and Caryn C. Vaughn published in the 2006 *Freshwater Biology Journal*, they looked at the influence of unionid mussels on the distribution and abundance of benthic algae and invertebrates. In this study they conducted an experiment in the Kiamichi River in Oklahoma, where they compared the benthic community in live mussel beds versus just the presence of mussel shells and also a mussel-free control. Spooner and Vaughn (2006) found that the algae and invertebrate abundance was higher in the live mussel beds than in either the mussel shells or mussel-free control areas. They suggest that the invertebrates were responding to higher levels of organic matter and nutrients deposited by the live mussels. Also they concluded that the invertebrates were responding to the increased amount of algae on live mussels as food and/or shelter.

Therefore, not only are freshwater mussels good habitat for benthic macroinvertebrates, but their filter feeding cleans the water of detritus and bacteria, and they are an important food source for many aquatic and terrestrial animals. There are about 53 species of freshwater mussels in Texas, and six species can only be found in Texas. About 38 percent of those 53 species are thought to be in danger of becoming extinct. These amazing creatures are very sensitive to changes in their environment such as siltation from construction sites, pollutants, river flow alterations, and salinity.

Texas Mussel Watch volunteers help by monitoring populations of these incredibly beautiful and increasingly rare species and helping biologists map out their distributions. To learn more about these amazing creatures and a program called Texas Mussel Watch, please check out this Web site: www.tpwd.state.tx.us/mussels.



2006 Texas Mussel Watch

Marsha E. May, Texas Nature Tracker Biologist

What a great year for Texas Mussel Watch! More volunteers monitored mussels than ever before (see Figure 1). Since Texas Mussel Watch (TMN) began in 1999, 75 volunteers have participated in monitoring mussels in Texas. A special **thank you** goes out to **Ronald Rushing**, who has monitored the Navasota River with his science camp students for five years running; and to **Mike McKay** and **Allen Bartell**, who have involved Texas students in monitoring mussels in Hubbard Creek Lake and Lake Livingston, respectively, for four years.

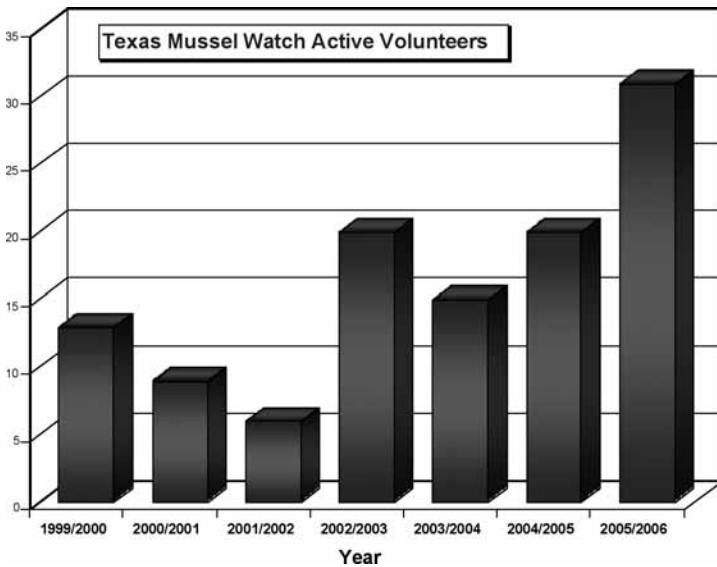


Figure 1. Number of Texas Mussel Watch volunteers who contributed data throughout the years.

Locations within nine Texas drainage basins in 21 counties (see Figure 2) were examined for freshwater mussel species by 33 TMW volunteers, students from Ronald Rushing's Summer Science Camp, Houston ISD's Outdoor Education Center students taught by Allen Bartell, students from Mike McKay's Texas State Technical College Environmental Biology Class, and three TMW workshops. A total of 26 out of 53 Texas native freshwater mussels were observed. The Trinity River drainage basin had the greatest number of species, with a total of 19. Asian clams (*Corbicula fluminea*) were recorded in 17 out of 21 counties and no zebra mussels (*Dreissena polymorpha*) observed.

Eight species on the Special Animal List by the Texas Biological and Conservation Data System were recorded by TMW monitors:

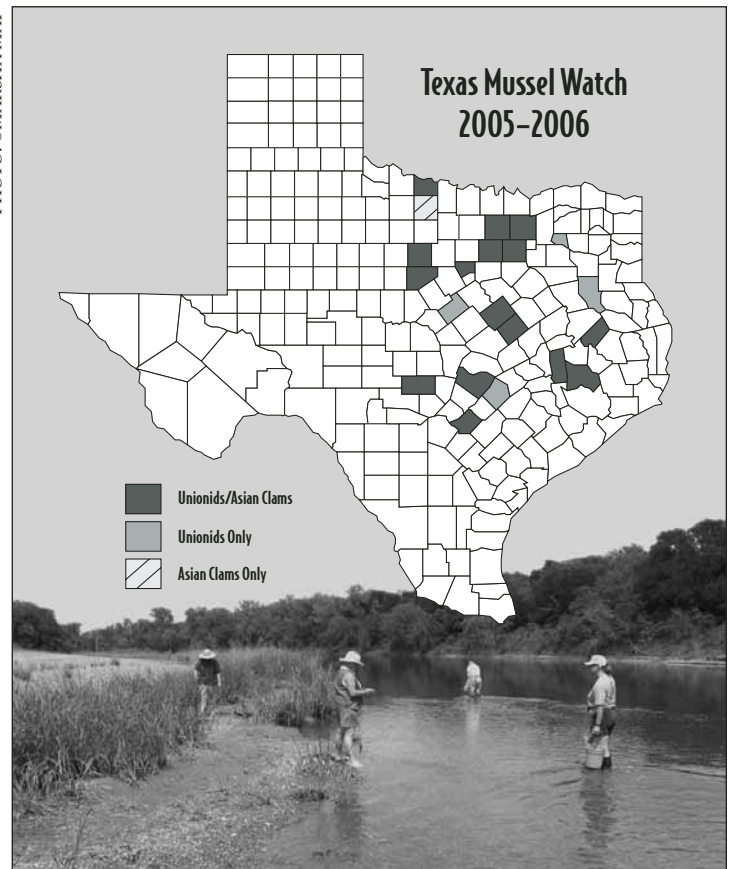
- **rock pocketbook** (*Arcidens confragosus*) – Trinity River
- **pigtoe species** (either *Fusconaia flava* or *F. askewi*) – Trinity River

Figure 2. Counties where Texas Mussel Watch volunteers recorded unionid mussels and Asian clams (*Corbicula fluminea*). Photo is of the Rio Brazos Master Naturalists.

- **smooth pimpleback** (*Quadrula houstonensis*) – Colorado, Brazos and Navasota River
- **pistolgrip** (*Tritogonia [Quadrula] verrucosa*) – Trinity and Brazos River
- **Texas fawnsfoot** (*Truncilla macrodon*) – Brazos River
- **little spectaclecase** (*Villosa lienosa*) – San Jacinto River

We would like to thank every one of our Texas Mussel Watch volunteers for bestowing their precious time and energy by mucking around in the lakes, rivers, and creeks collecting data on these wonderful creatures.

PHOTO: ©MARSHA MAY





2006 Texas Mussel Watch Volunteers

Michael Adams
Allen Bartell
John Caldeira
Diane Cutler
Tim Dalbey
Denise Evans
Jim Flood
Neil Ford
Laura Gillis
David Jayroe
Annette Jones
Judy Lewis
Melissa Macdougall
Kathleen McCormack

Jane McGough
Mike McKay
Penny Miller
Ben Morris
James Mueck
Timothy Mueck
Melissa Mullins
Roger Myers
Mary Phelan
April Proudfit
Ronald Rushing
Nora Schell
Tamara Sevier
Victoria Sevier

Linda Sharp
Bill Stout
Betty Watkins
Elisabeth Welsh
Terry Young

Heart of Texas
Master Naturalists Chapter

The Preserve at
Forest Glen Springs

Rio Brazos
Master Naturalists Chapter

For more information on Texas Mussel Watch, please go to our Web site at: www.tpwd.state.tx.us/mussels

2006 Texas Mussel Watch in Breckenridge

Denise Evans, Student at TSTC

Students of the Texas State Technical College Environmental Science Department, Breckenridge Campus, have been participants in Texas Mussel Watch since 2001. Two students attended the Texas Mussel Watch Workshop in Waco in the spring of 2006 so that they could bring rest of the students in the class up to date on the program. The class was very informative and aided the students in their research, projects, and student driven lab. They were curious to see how years of drought had affected the local area.

The students had expected to see a sharp decline in the mussel population of Hubbard Creek Lake due to the drop in water level and the increase in salinity that generally goes along with that, so they were pleased to find an area of with a fairly large population of mussels. The specimens found varied from live specimens to very-recently dead, and included southern mapleleaf (*Quadrula apiculata*), bleufer (*Potamilus purpuratus*), and pink papershell (*Potamilus ohioensis*). Unfortunately, the ongoing lack of rainfall in the area could take its toll if we do not see a change soon.

This year's project was headed by Michael Adams and Denise Evans. Along with the students of TSTC, they were also joined by some of the local children of Breckenridge. They hope to pass on a degree of knowledge and awareness to younger generations, while increasing interest in the field. Texas State Technical College is proud to continue to support the conservation and awareness efforts of the Texas Parks and Wildlife Department's Texas Nature Tracker programs.



A Drought of Horned Lizard Sightings

Lee Ann Linam, Texas Nature Tracker Biologist

Dry conditions made horned lizards and harvester ants lie low in 2006, but some of our horned lizard watchers were still hard at work!

In 2006, 22 volunteers submitted data sheets to Texas Horned Lizard Watch, representing 16 adopted habitats, four transects, and four horned lizard spotter reports. Of those, 13 were lucky enough to spot Texas horned lizards in 2006. Texas Horned Lizard Watch has now had 186 volunteers officially participate.

Volunteer data combined with results of surveys conducted by the Horned Lizard Conservation Society and incidental reports produced results for 31 counties in 2006. The addition of Collin County brings the total number of counties participating to 165. Of those, horned lizards have been seen in 146. This year a roundtail horned lizard was also reported from Crockett County.

Extremely low rainfall in late spring and summer did seem to reduce likelihood of sightings in 2006, resulting in negative results from some counties, such as Val Verde and Brown, where horned lizards were previously encountered. Transect surveys conducted on Matagorda Island in 2006 demonstrated variability in sampling

results and showed that high levels of sampling intensity may be needed to detect horned lizards even in suitable habitat. Volunteers and refuge staff repeatedly sampled several transects by foot and vehicle that totaled 100 miles and produced 11 sightings. On the other hand, one sampling of a five-mile transect there (under presumably ideal conditions) produced sightings of six horned lizards!

Several watchers made notable contributions in 2006. **Austin Lowe**, a student in Andrews County, recorded observations on 11 different days. He was rewarded with 14 sightings, including at least eight different individual horned lizards. Austin plans to use his results as part of a 4-H project. An excellent report was again received from students at **Texas State Technical College**. Mike McKay's Environmental Biology students have participated in our watch program since 2001. An excerpt from their final report is provided on page 13.

Britton and Gayle Phillips, Beverly Kitzman, and Ed, Linda and Anna Allen have now participated for all 10 years of Texas Horned Lizard Watch! Britton and Gayle have faithfully surveyed their property in Burnet County, but have, unfortunately, not yet encountered a horned lizard. Beverly has been a wonderful outreach effort for Texas Horned Lizard Watch in Coke County, where she often collects sightings from all around, in addition to her own property. Ed, Linda, and Anna have made it a family effort to survey a road transect in Dickens County and have collected many insightful observations about horned lizards over the years. Each of these volunteers will be receiving a beautiful silver-plated horned lizard pin designed by Tom McCain of Horny Toad Connections.





Texas Horned Lizard Watch at Texas State Technical College, Breckenridge, Texas

Matt Mooney and Brad Starnes, Students at TSTC

As students of the Environmental Biology Class at Texas State Technical College in Breckenridge, Texas, we were able to participate in the Texas Horned Lizard Watch hosted by the Texas Parks and Wildlife Department. Under the direction of Mike McKay, Environmental Science Technology Department Head, we decided that it would be fun to undertake this project for our student-driven lab. Many of our fellow classmates have shared memories of seeing and playing with Texas horned lizards during their childhood. Unfortunately, these same classmates have seen a great decline of this species in recent years. Many of them said they have not seen a single one for many years. During our horned lizard watch, we found this to be true, with only two sightings being made. Our searches were performed during various times of the day and at different temperatures. We did, however, find several pieces of scat in our search area, which led us to believe there are horned lizards in the area.



A Special Survey Focus: Rural Cemeteries Worth "Watching"

Bill Brock of the Horned Lizard Conservation Society has initiated a unique twist on Texas Horned Lizard Watch. During 2007 and 2008, Bill is encouraging volunteers to visit rural cemeteries to conduct surveys for horned lizards.

These lightly-maintained cemeteries often contain relict populations of rare native plants and, in Bill's experience, sometimes host populations of native ants and horned lizards. (In addition, it's often an interesting historical experience to visit these "out-of-the-way" cemeteries!)

For more information on how to participate and to receive the project data forms, contact Bill at bill.brock@abilenetx.com.



Cross Plains Kids Endure Wildfires and Rally to Win Horned Lizard Essay Contest

Mariah Mathys, TNT Intern

The students at Cross Plains Elementary School managed to win the 2006 Hometown Horned Toads Essay Contest in spite of a great tragedy in their hometown. They began their research and interviews shortly before Christmas break, but during the holiday period wildfires destroyed numerous homes and businesses, including the home of their teacher, Connie Ricci.

In spite of this tremendous loss they were able to bring together their research and write papers that won the team category in Grades 3–5 and finished as runner-up in the team category in Grade 6–8. Ricci said that she and her students “feel doubly blessed that we managed to be successful in this endeavor at a particularly difficult time.”

Once common across the state, numbers of Texas horned lizards have declined in recent decades. This prompted a creative group of state wildlife biologists to launch the student essay contest as one way to spread awareness of the official state reptile’s plight, plus collect information that may help reverse the lizard’s decline. Participating students not only increase their knowledge of the horned lizard, but they help the Texas Parks and Wildlife Department gather information on when and how the horned lizard began to diminish in their hometowns. Students conduct interviews with family, friends and local residents to find out personal stories, facts, and memories of the horned lizard in the local region.

The essays flowing in over the past five years have offered an array of explanations as to when and why the horned lizards are disappearing. The most common accounts state the horned lizard began declining in the 1970s and ’80s due to urbanization, the introduction of the red fire ants, and pesticide use.

“Student interviews are extremely valuable because they not only provide information which can be used to help these reptiles recover, but they are often the only record of the horned lizard’s presence in a specified area,” said Lee Ann Linam, a TPWD biologist in Austin who helps coordinate the essay contest. “Researchers are then able to use this information for a more thorough analysis and understanding of the trends concerning the lizard population decline. With this improved understanding, steps can be taken to protect the lizard and conserve the habitat that is the key to its continued survival.”

Essays were judged on various levels, including background research, a description of the study area, analysis of the interviews and research, organization, and most importantly, the number, thoroughness and creativity of the interviews. Essays were judged by outside volunteers and TPWD employees. Team winners were rewarded with a field trip of their choice to a TPWD wildlife management area, and individual winners receive prize packs, which include items to stimulate and assist the children’s interest in nature.

The winners of the 2006 essay contest were as follows:

Grades 3-5 Individual:

- 1st place—Austin Fahy, Yeager Elementary
- 2nd place—Haleigh Hurst, Yeager Elementary
- 3rd place—Turner Warren, Pipe Creek Christian Elementary

Grades 3-5 Team: Cheyenne Cowan, Katharine Goode, Hoe Holland, Riley Lawrence—Cross Plains Elementary

Grades 6-8 Individual:

- 1st place—Ceren White, Leonard Middle School
- 2nd place—Lauren McCollum, Lee Middle School
- 3rd place—Courtney Trout

Grades 6-8 Team: Adam DeLoach, Gaby Dillard, Faith Dillard, Kayla Fisher, Katelyn Inkster, Kate Kainer, Renee Lavigne, Teddi Pinson, Audrea Sprinkle—Host Organization of South Texas

Grades 9-12 Team: Advanced Wildlife Management Class—Childress High School

The Hometown Horned Toads Essay Contest was sponsored by the Texas Parks and Wildlife Department, the Texas County Historical Commissions, and the Horned Lizard Conservation Society. It was created as an extension of a program called Texas Horned Lizard Watch. This program consists of volunteers who monitor the horned lizard and compile scientific data concerning the reptiles’ condition for TPWD. This program’s research has produced much information pertaining to the horned lizard’s distribution, and the identification of its habitat for the state of Texas.

For more information about how to join Texas Horned Lizard Watch, visit the program Web site: www.tpwd.state.tx.us/hornytoads



HOMETOWN HORNED TOADS ESSAY CONTEST



2006 WINNERS

Grades 3–5: Individual Essay

Harmless Horned Toads

Go Horned Frogs! The TCU horned frog mascot was originated by the Texas horned toad which is really a lizard. This lizard is our state reptile and is now on the threatened species list in Texas. The horned toad can still be found in West Texas, but is rarely found in East Texas anymore.

The horned toad's favorite food are ants, but they will eat grasshoppers, beetles, crickets, pill bugs and spiders. They mostly eat red harvester ants sometimes eating up to two hundred of them in one day. That is amazing! Horned toads can squirt blood from their eyes when they are alarmed. It can squirt up to four feet. Horned toads sleep or hibernate throughout the winter. They usually come out of hibernation in the late spring.

I chose Houston as my hometown. Since the horned toad population is not "hopping" I gathered information from other cities too!

I interviewed three people which were: Mrs. Epple (my language arts teacher), Kristen Hutson (employee of the Houston Arboretum and Nature Center), and Tyler Ahenmann (Manager of Academic Programs for the Houston Zoo). Mrs. Epple told me that horned toads are very friendly little creatures. She saw her first horned toad when she was a child at camp in West Texas. Tyler Ahenmann said that we need to "protect the wildlife". Habitat loss is one of the primary reasons that their population is dwindling. Kristen Hutson said that the horned toads primarily eat harvester ants and there are not many harvester ants in the Houston area. Harvester ants are being killed by insecticides and by "very aggressive fire ants". The horned toads are still in the Greater Houston area, but rarely are found within the city anymore. There is so much construction in Houston that they are losing their environment.

I think we should write our legislators in Austin to provide a bill to protect our state reptile. We would not want Texas Christian University to lose their horned toad mascot!

Grades 3–5: Team Essay

Where Are They Now?

Missing: our beloved horny toad friend that we've seen, played with, stuffed in our pockets, and sold for 5 cents is now disappearing. Or does it just not want us to see it? Either way, we don't see it anymore. So we have been researching and trying to figure out the mystery of their disappearance. We wanted to know where the horned toad lives, what they look like, if our hometown would be a horned toad heaven, and what the community was like when horned toads were around.

Our state lizard can grow 2 1/2 inches to 7 inches long. Pretty small, huh? Their colors can range from white to red tones. Many of them have a blend of dark brown spots and lines, which creates a pattern. They have flat bodies, pointed snouts, and numerous horns on their heads and sides. Some people say this makes them fierce looking, but we don't think so.

The endangered horned toad prefers to live in semi-arid open areas. They're found where the soil is loose, sandy, or loamy because they like to bury themselves under the soil. They are found in the Southwestern United States.

While we were researching, we found some cool facts about horny toads. For example, did you know the horned toad squirts blood from the corner of their eyes and puff up when they feel alarmed or that the amazing female can lay up to 30 eggs which hatch in 5 to 9 weeks? That's a lot of little horny toads running around. Another interesting fact is that horny toads hibernate from late September to early April. It also is interesting that some people think the horned toad is a symbol of strength.

Our hometown, Cross Plains, is a great place for horned toads. It's a very nice town because we have a lot of vegetation, agriculture, ranching, and farming. Here is something the horned toad would enjoy about our community. We have tons and tons of ants!! Did you know horned toads can eat around 200 ants per day? That's a lot of ants, right? (We bet you don't eat that much. We also bet you don't eat ants.) Anyway, Cross Plains is a horned toad heaven because of these reasons.

For our research we interviewed 16 people, Wesley Ingram, James Crocket, Robert Pipes, Elvan Goode, Julia Wheeler, Margie Sowell, Dianna Stover, Charles Chesshir, Leslie Lawrence, Keith Lawrence, Kathy Purvis, Cam Morgan, Paula Winfrey, Dean Dillard, Dennis Dickson, and Connie Ricci. Our interviewees are teachers, ranchers, farmers, and business owners. They said that the horned toads were most common in the early 1950's to the late 1970's when the area was not as populated and farms and ranches were more natural because they didn't use all the pesticides. Most of our interviewees said they noticed that the horned toads became less common in the late 1970's to the early 1980's.

Of our 16 interviewees, only 10 have seen horned toads from 2000 to present. We think horned toads are disappearing because of the use of pesticides and population growth, which has caused habitat destruction. We came to this conclusion, because Katharine Goode, one of the researchers, lives on Silverbrook Ranch where pesticides aren't used at all, and there is no population growth to cause habitat destruction. On the ranch, Katharine's father, Elvan Goode, one of our interviewees, sees horned toads all the time in the pastures. Therefore, we believe horned toads are still around, but in places where their habitat is not being destroyed.

Where are they now? They are living among us, and we think we can save horned toads from becoming extinct if we all work together to stop using as much pesticides and to stop destroying their habitat. We believe that we can save our beloved horned toad for generations to come.



2006 HOMETOWN HORNED TOADS ESSAY CONTEST WINNERS

Grades 6–8: Individual Essay

Texas State Reptile: Going, Going, Gone!

For centuries the Texas State Reptile, the horned lizard, roamed the streets and vacant lots of Granbury and the nearby hills and rocky bluffs in great numbers. Since the late 1960's, however, this gentle lizard has become practically extinct in Hood County. Today this enchanting little horned lizard is rarely found in the vicinity. It is important to everyone who is concerned about the environment and loves Texas animals to find the cause of the disappearance of this beloved "horny toad" and hopefully restore this species to this county and to the areas of the state where it has disappeared.

The life cycle of the lizard is very interesting. The female digs a hole in the earth and lays about 30 eggs which are incubated by the warmth of the sun on the soil. When hatched in about five to seven weeks, the baby lizards are about an inch in length and may grow to a length of five to seven inches. The coloring is tan or gray with dark brown spots on the back of the head, body and tail. It is a flat, broad lizard with a pointed snout. It is covered with spiny scales, the two long ones on the head resembling horns. It has an average life span of ten years, although the legendary horned toad, "Old Rip" was reportedly found alive after having been sealed in the cornerstone of the Eastland County courthouse for 35 years!

The main diet of the horned lizard consists of the big red harvester ants which he hunts by day. Never straying too far from the ant's huge mound, the horned lizard waits patiently until he has his fill of the giant red ants.

The lizard has several means of protecting himself from predators. He can flatten himself until he is almost invisible with his camouflaged body blending into the sandy soil so that he becomes difficult to see, or bloat his body so that he can frighten the predator or at least makes it more difficult to be swallowed. He can spit a disgusting tobacco-like substance from his mouth that discourages molesters and small children. In extreme cases, the lizard can squirt a thin stream of blood from glands near the eyes into the face of the marauder. When all else fails, he can run quickly through the brush to find a hiding place under the sand or behind a rock or bush.

Their natural habitat is typically a warm, sandy, arid region found in flat, open regions with little vegetation, and preferably not too many people. The horned lizard hibernates from late summer to late spring, so the middle of the summer is the preferred time to go on a "horny toad" hunt.

Granbury, Texas has been a part of my family's history since my great, great grandparents moved to Hood County in 1912. I visited my great grandmother and great aunt there often and lived there when I was in the fifth grade. It is a small rural town and the Hood County seat. It boasts a beautifully preserved town square which is listed on both the state and national places of historical interest. I chose this charming place for my research because at one time the area was a favorite habitat of the horned lizard and because my great aunt knows a lot of older people who were wonderful for the interviews. It is located about 35 miles west of Fort Worth on highway 377 in an arid region that is covered with prickly pear cactus and Texas juniper trees which grow all over the limestone hills. It was built on the Brazos River which was dammed in the late 60's to form Lake Granbury. Many new houses were built in the county after the lake was filled. This land use destroyed much of the habitat of the horned toad.

To get information about the recent history of the horned lizard, five people were interviewed. Four of those interviewed were female and one was a male. They ranged in age from 40 to 80 years. The oldest resident had lived in Granbury over 80 years and most recent resident had moved to the county about 10 years ago. They all had a similar story to tell, although there were some differences. All of them agreed that the horned lizard had at one time been plentiful in the area and has now almost disappeared. The lizards which were seen by the interviewees in the past five years were found near harvester ant beds which were located away from densely populated areas. All had played with the horned toads when they were children and two had tried to make pets of them by catching them and putting them in a glass terrarium with sand, water and a supply of red ants, caught to supply the diet of the lizard. Mary Kate Durham reported that she had found a mummified toad in a vacant house a few years ago. This toad now lies in state in the Hood County Museum. Anne Huddleston reported that she once knew a jeweler who decimated small toads while using the lost wax process to manufacture silver or gold charms for bracelets. June Pack said that she still has at least one toad that visits the red ant bed on her property which is located about four miles north of Granbury. Jerry Ables remembers when this endangered species was so plentiful that you had to watch where you stepped so as not to injure one. Robin Vickery often played with them, using a stick to guide their travel. She really did not wish to harm one or to touch one.

All of those interviewed agreed that the horned lizard began to disappear around the late sixties and was noticeably less plentiful by the eighties. In the new century of 2000, the toad is virtually gone from this once favorable habitat.

All agreed that several changes in the environment contributed to the disappearance of the horned toad from Granbury and Hood County. Among the reasons suggested were the growth of the population of the area, including houses, streets, shopping areas and all the building that accompanies a large population growth which destroyed much of the lizard's habitat; an increase of the use of insecticides and pesticides which were used to control the fire ants and other insects that were harmful to farmer's crops but also destroyed many of the red ants that are the lizard's main diet; and perhaps chemicals that have been added to our soil for fertilizing for larger crop yields are toxics to the lizard.

Other reasons for the lizard's disappearance were found in publications and from the internet and include their collection for the pet trade by unscrupulous traders and the coming of the cattle egret to Texas around 1954. The egret chicks reportedly prey on small toads, frogs, and lizards.

From the research I have done through interviews, the internet, and publications, my hypothesis about the disappearance of the horned lizard from Granbury and Hood County have led to the following conclusions. (1) The horned lizard began to become less plentiful in the 1950's, by the 1970's its population had greatly decreased, and in this century, the lizard has all but disappeared. (2) The reasons for its demise include a decrease in the natural habitat, poisoning by pesticides and insecticides, disappearance of a plentiful red ant diet supply and the introduction of predators, such as the fire ant and the egret into their environment.

What can be done to save this beloved Texas animal? A breeding program, such as is done for endangered mammals could be started. Breeding pairs could be housed in a controlled environment until there were enough lizards to re-introduce to their former habitats. Of course, changes in the environment would be necessary or the lizard



2006 HOMETOWN HORNED TOADS ESSAY CONTEST WINNERS

would face extinction once more. The lizards should be released into areas where there are few people and a lot of red ants. Therefore, replacing them in towns would not work, as there aren't many people who want their well tended lawns to be scarred by giant red ant beds. The only hope would be to place the laboratory raised lizards in the hill of the country where their food supply is plentiful and there are few people to molest them. In case this approach will not work, the only places to save them would be reptile houses in zoos or other animal parks where they would be well taken care of for the viewing of visitors who never have seen a live horned lizard and for those whose childhood memories recall the "horny toad" with much fondness.

I hope that the horned lizard can be saved, if only in a controlled environment such as a zoo, so that my children and grandchildren may have the pleasure of seeing it alive and thriving. It would be a tragedy to lose this little Texas treasure.

Grades 6-8: Team Essay

Corpus Christi Construction Says "Adios" to Horned Lizards

The Horned toad or the Horned Lizards is one of Texas' most prized reptiles. This interesting specimen earned its name from the horns that grow on the head and the body, to avoid getting eaten. The animal's numbers are decreasing. Why? Corpus Christi's Horned Toad habitat was destroyed with the construction boom of the 1950s, 60s and 70s.

Though not very big on the map, Corpus Christi (Corpus) has played a continuous role in American history. Corpus was first explored by the Spanish explorer Alonzo Alvarez de Pineda in the year 1519. It remained relatively unknown for the next 300 years with an occasional attempt at settlement that never thrived. But in 1839, Col. Henry Kinney decided that the location would be a good place for a trading post. Surprisingly, it grew into a thriving town. In the mid-1840s Zachary Taylor, along with his troops spent a short time in the area preparing for war with Mexico. Corpus Christi also played a role in the Civil War when Union forces occupied the area known as Mustang Island in 1863 and interestingly, Corpus Christi was actually bombarded on two separate occasions. The name "Corpus Christi" was given to the area in 1847 for a more definite postmark. The first city ordinance was adopted on January 15, 1879, making it against the law to let hogs and goats run loose. In the mid-1920s, a ship channel was dug to make a part which would better utilize the bays to increase jobs and trade. Again, this would cause the area to grow and popularity and in population. Again the city would grow with the addition of the Naval Air Station. Though still not very big on the map, Corpus Christi's name is much better known and is still playing a role in history.

The many different kinds of Horned Toads all have spear-like horns that run down their tails and spines and wide, flat, toad-like bodies. Although ants make up the majority of their food, they eat slow, ground-dwelling insects, ants, spiders, and small butterflies. Their defense skills include their prickly horns, changing color, and a surprising way of squirting blood from their eyes up to three feet. The color of their back and head are a desert gray with patches which are either a tan, brown, red or yellow. While their colors match the dirt, they can change to shades of light to dark in a few minutes. They usually inhabit regions that are sandy and have heat that is almost unbearable to humans. Corpus Christi made a wonderful habitat for Horned

Toads. It has loose sandy soil and it definitely gets unbearably hot.

Sheri Golden, in interviewee, has grown up in Corpus. Mrs. Golden has seen several Horny Toads in Corpus. She saw them during the 1970s. At that time Corpus had ponds and creeks and the outlying areas did not have any buildings. Mrs. Golden started to notice that the Horny Toad sightings were decreasing during the 1980s. She thinks what caused this decline was due to loss of habitat. By the 1980s, even the outlying areas became as populated as downtown Corpus.

Margaret Sciantarelli said that she could remember when her brother used to play with Horned Toads and sometimes they would take them to school and scare the girls. Mrs. Sciantarelli believes construction is why the Horn Toads left. Leigh Gray remembers when hurricane Celia was over and there were lots of mosquitos. She and her father went outside with a huge bucket and would pick-up the Horn Toads and put them in the bucket. Then they would bring the bucket home and put the horn toads in their backyard to eat up all the mosquitoes.

Bill Kainer said "He would never touch one!" He thought they looked like prehistoric animals. "I think the Horn Toads are more rare because more houses were built and constructed."

Steven Howden lived on Caddo Street in about 1962. He thinks that construction is the reason that the Horned Lizard is disappearing. He used to see Horned Lizards on driveways, roads, and in empty lots. A few years later the population in Corpus went up dramatically due to the arrival of the Corpus Christi Naval Air Station. With the completion of Highway 37, builders and carpenters struck it rich with all the homes they built. Seeing these changes, many restaurants came in and local businesses expanded dramatically. Buildings took over all the open space and the Horned Toads' habitat diminished.

In 1964, 6-year-old Teresa DeLeon loved to catch and play with the Texas Horned Lizards! She and her brothers lived in a little blue house next door to a man-made pond. They would spend hour after hour by the pond playing with these little creatures. But in the late 60s, their times with the lizards slowly ended. In 1967, as Corpus Christi started to grow; new buildings were built, more parks paved over, and more houses were erected, Teresa and her brothers stopped seeing Horny Toads. Every once in a while they would find one. But by the early 70s they were nearly impossible to find! Teresa DeLeon still lives in the little blue house, but now there's no pond, and no Horny Toads. She strongly believes that if there wasn't so much construction, her daughters would be able to play with the lizards like she did when she was their age.

A life long resident of Corpus, Tammy Umberson, remembers seeing the Horned Lizards about 1966-68. She remembers the roads were not paved, and in the 1950s, 60s, and 70s there was a lot of construction. She believes the rise in construction is the reason the Horny Toady population declined.

Grover Pinson was a little boy growing up in the 1960s and he used to play with Horned Toads. The area surrounding Mr. Pinson's home was ranch land. In the early 70's, all the ranch land had been converted into neighborhoods to absorb the growing population. Teddi Pinson, daughter of Grover Pinson, lives in the same area 30 years later and has never seen a Horned Lizard in that area.

One of the most logical explanations for the disappearance of the Horned Toad Lizard is construction. In the 1950s, Corpus Christ's population was under 100,000, now it is over 400,000. We believe that the development of Corpus Christi from ranch land into an urban city has contributed greatly to the demise of the Horned Toads in this area of Texas.



2006 HOMETOWN HORNED TOADS ESSAY CONTEST WINNERS

Grades 9–12: Team Essay

Sociological Trends as an Explanation for the Disappearance of the Texas Horned Lizard

Introduction

A very prominent legacy began in the early 1880's at the time Childress County was originally established. At this time, the spirit of the Texas Horned Lizard was born. For nearly a century following the colonization of the red dirt plains, the horny toad prospered among the settlers of the county. However, for the past twenty years, there has been a decrease in encounters with these small reptiles. By interviewing people in our community over the age of 50, we obtained various opinions on the decline of the horned lizard. With this information, we were enlightened on the cause on the supposed cause of the dwindling population of the Texas Horned Lizard.

About the Texas Horned Lizard

The Texas Horned Lizard, also known as *Phrynosoma cornutum*, is listed as an endangered species in Texas. It is about 2.5 to 4.25 inches long. The Horned Lizard has a wide, flattened, toad-like body with a fierce looking appearance. Horned lizards are noticeably spiny with a crown of horns adorning the back of their heads, along with various spines on their bodies. The two horns located at the center of the head are more noticeable than the rest. Unlike the common lizard, the horned lizard has a flat stone-like body that aids with their camouflage and burrowing habits.

The horned lizard hibernates during September and October, and usually starts mating immediately after hibernation in April or May. They immerse from dormancy in the spring when the sun's rays warm the ground. The first few hours of the day are spent basking, usually flattened against a rock of slanting soil with their back exposed to the sun. While warming up, they may level and tilt their bodies toward the sun to obtain maximum radiation.

The diet of the horned lizard consists of red ants, grasshoppers, beetles, spiders, and other invertebrates to supplement their diet. They usually search for food in open areas, moving quietly while searching or waiting for any unsuspecting prey. However, horned lizards are victimized upon by many different species of animals, which include hawks, roadrunners, snakes, lizards, coyotes, ground squirrels, mice, cats, and dogs.

Horned lizards attempt to avoid predators by using various tactics, some of which are quite unique. Their most unusual tactic is their ability to squirt a stream of blood from the corners of their eyes. As a last resort, this stream may be directed with limited accuracy at the predator's eyes and mouth. They also use an unusual self defense mechanism in which they flatten out and freeze in place at the time they feel threatened.

About Childress County

Childress County is located in the southeastern corner of the Texas Panhandle. It is neighbored on the east by Oklahoma, south by Cottle County, west by Hall County, and north by Collingsworth County. The county is named after George C. Childress, author of the Texas Declaration of Independence.



The County seat, Childress, is located 116 miles southeast of Amarillo, on the Fort Worth and Denver Railway and U.S. Highway 287. The center of the county lies at approximately 34 degrees north latitude and 100 degrees west longitude. The county comprises of 699 square miles of rolling prairies and rough river bottoms. The elevation ranges from 1,600 to 1,900 feet above sea level. Childress County has an annual growing season average of 217 days, along with annual precipitation averaging 20.67 inches a year. The average minimum temperature is 26 degrees Fahrenheit, and the average maximum temperature is 95 degrees Fahrenheit in July.

The soils are a mixture, consisting of a sandy loam combined with alluvial sands from the county's many creeks and rivers. These soils support a variety of native grasses, as well as cotton, wheat, and sorghum. Rangeland vegetation consists of shin oak, mesquite, salt cedar, and hackberry trees. A major water feature of the county is the Prairie Dog Town Fork of the Red River, which bisects the county as it flows eastward into the main channel. This stream and its tributary creeks render much of the central and northern part of the county unfit for farming. Thus ranching retains a significant role in the county's production agriculture.

Interviewee Results

We conducted the interviews used for this research in December 2005, and the results were compiled in early January 2006. Each advanced wildlife student was prompted to interview three people whom have lived in Childress County the majority of their lives, totaling 38 interviews.

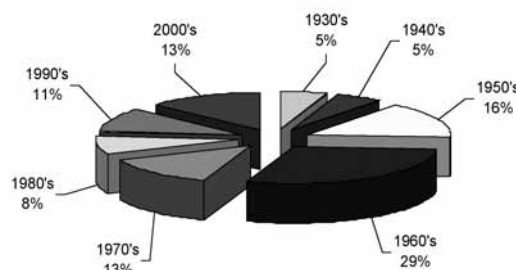
Interviewee Profile

When we averaged all of the responses together, here is the average profile of those interviewed:

- The average person has lived in Childress for 52 years;
- 100% of the interviewed people remember seeing Texas Horned Lizards in this hometown;
- Feelings were mixed with the majority saying either the countryside is the same now as it was when horned lizards were common, or it is drier now;
- 65.8% said they noticed horned lizards were becoming rarer;
- The average person thought the horned lizard became rarer in 1984;
- 26% of the people thought nothing was changing at this time, and 21% felt that the country was less populated;
- 29% thought Texas Horned Lizards became rarer as a result of chemicals;
- Most said the last time they saw a horned lizard was in 2003;
- 100% of the interviewed people said that they thought horned lizards still live in this hometown.

Although answers vary, 45% of those interviewed thought Texas Horned Lizards were most common in the 1950's and 1960's as illustrated in the chart.

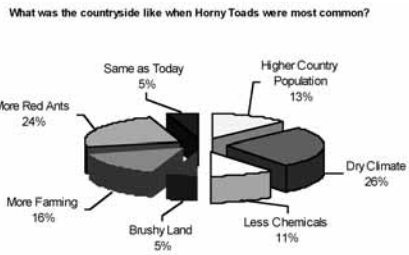
When do you think Texas Horned Lizards were most common?





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The next chart illustrates that the answers to the question vary, but about half of the interviewees thought the climate was drier. They also believed there were more red ants at the time Texas Horned Lizards were common.



In the last pie chart, a significant majority of the people believes the Texas Horned Lizard population has decreased, and the reptile is becoming rarer.



What does this all mean?

The majority of those interviewed agree the Texas Horned Lizard population has declined. However, 100% say they believe these reptiles are still residing in Childress County, and 63% reported seeing a Horned Lizard last summer.

In analyzing the research done in Childress County during 2001 and 2003, it seems the alleged decline was a result of a changing habitat, not the increased use of chemicals. This thesis is sustained by the evidence that there are now fewer and safer chemicals being used on present day crops. Still, it seems the Texas Horned Lizards has failed to recover. Therefore, due to the data collected, we eliminated the use of chemicals and pesticides from being a factor in their supposed decline. The horned toad research conducted in Childress, Texas, since 2001 shows that Childress County has undergone substantial changes from 1960 including:

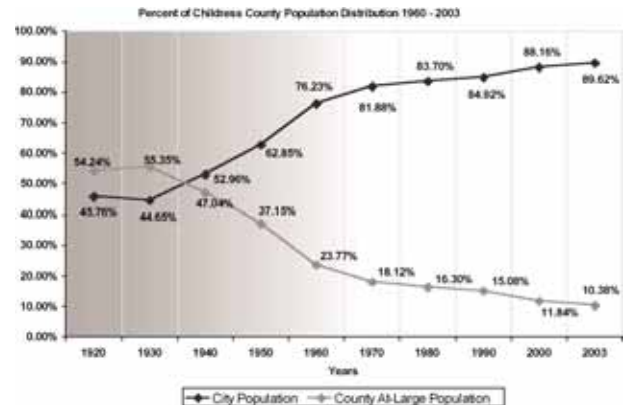
- A 15.5% increase in the county population;
- A 56% decrease in farmland county-wide;
- The introduction to Conservation Reserve Program land in the places where farmland once existed.

Since the increase of the Childress County population has occurred in the only town in the county, we feel the population increase has had an insignificant effect on the Texas Horned Lizard population. Although the size of the town has increased, the number of people living on farmsteads throughout the county has decreased by 86.76% since the 1920's.

Therefore, it seems the reports of the declining Texas Horned Lizard populations may be largely subjective. When the majority of the county population lived in the country, small farmsteads created bare ground areas around their premises that were advantageous to red ant colonization. As the amount of farms and farmland lessened, the number of red ants may have decreased, which resulted in the reduction of the Texas Horned Lizards in the Childress County area.

However, we do not believe the loss is as substantial as some may claim.

Considering that 89% of all the residents in Childress County live within the city limits of Childress and less people live in the country, the likelihood of incidental contact with the reptile is immensely reduced. From 1950, the county-at-large population has minimized from 37.15% to 10.38% of the total while the in-town percentage of the county-wide population has grown from 62.85% to 89.62% presently (see chart at the top of the next page). These time and population trends coincide with the ages of the people interviewed in this research.



As the likelihood of incidental contact is reduced, people may perceive there are fewer Texas Horned Lizards based solely on their personal observations.

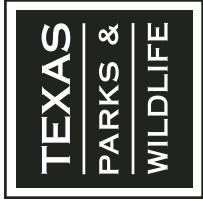
To arrive at a more accurate conclusion, we determined 76% of those interviewed lived in the country as children, compared to the 47% that still reside in the country. The fact that less people currently live in the country illustrates the possible reasoning as to why many people feel the Horned Lizard is becoming scarce. Therefore, less people may actually be in a position to encounter the reptile.

It is difficult to determine whether there are fewer Texas Horned Lizards in Childress County. The overall decline in Childress County may be the result of people assuming there are fewer horned lizards, because their busy lives in town keep them from having unintentional contact with the reptile. In reviewing the Texas Horned Lizard research conducted by three previous classes, we found their interviews revealed that most people's perception of when the reptiles began to decline coincides with the time they were growing older and moving away.

However, on the land belonging to the Childress Independent School District, horned lizards are seemingly plentiful, and sightings of the reptile are very common. Within the land owned by the Childress School System, ground covered in grass at least two inches tall with prickly pear makes up 43% land, while bare ground makes up 57% of the surveyed land. These bare ground areas are ideal for red ants to colonize and forage to grow. Consequently, where you find red ants in the Texas Rolling Plains, you typically find Texas Horned Lizards.

Conclusion

In conclusion, horned lizards have been seemingly prominent throughout the history of Childress County. However, it seems the reptile's numbers have declined lately. Nevertheless, stories of the Texas Horned Lizard's demise may be overblown. The reason horned lizards are not presumably as plentiful in Childress County as they once were may be more sociologically based than biologically based. Simply put, there has been an exodus in population movement as more people have moved to town and less live in the country. As people move away from the country, the smaller county-wide population means less people are amongst the Texas Horned Lizards and are not as likely to have incidental contact with them on a daily basis. If you couple the fact that people are not seeing as many Texas Horned Lizards with the media reports that discuss the disappearance of the reptile in Texas, people may come to the wrong conclusion that the Texas Horned Lizard is in danger of disappearing in Childress County. Therefore, to conclude that the Texas Horned Lizard is disappearing from the rangelands of Childress County with any degree of accuracy, we need long term population data, so we are not required to rely solely on anecdotal observations. At this time, there is no possible means of determining whether the Texas Horned Lizard is actually vanishing from Childress County.



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