We were finally under-
way. Lengthening kidney-
wood shadows spread
out across the harvester
ant mound at my feet as I
closed the front gate. With
no ants at the opening, I
surmised the intense heat
had the industrious little
creatures holed up in a
more tolerable environ-
ment deep in the dirt.

Meanwhile, drought-
induced fires were burn-
ing throughout Texas and
other residents tried to
ignore the afternoon’s
torridity by relaxing on the
Labor Day weekend.

This particular evening, Eva, and I were invited
to join a small group of dedicated conservation
minded folks converging in Karnes County. Eva
is a Master Naturalist who frequently works as
a volunteer for parks, natural areas and Texas
Parks and Wildlife research projects. As one of
the privileges for being her husband, I was to
escort her as she joined her fellow conserva-
tionists for the evening.

Our mission was to catch, measure, and collect
DNA samples from the threatened Texas horned
lizard. Since the majority of the lizard’s diet
consists of harvester ants, the absence of these
assiduous little insects above ground, presented
us with a dubious omen at the beginning of our
evening undertaking.

Our trip would have been uneventful, had it not
been punctuated by intermittent grass fires tend-
ed by diligent rural volunteer fire crews along our
route.

Our destination and rendezvous was the Karnes
City Dairy Queen. Upon our arrival, we were
introduced to Lee Ann Linam, Coordinator for the
Texas Parks and Wildlife Department’s Texas
Horned Lizard Watch and her husband, Gordon
Linam, a Texas Parks and Wildlife Inland Fisher-

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ies Biologist. Our group included Dr. Jill Heatley, a Wildlife Veterinarian for Texas A&M University who also serves as the Horned Lizard Conservation Society President. Our friend, Ryan Darr, the Texas Parks and Wildlife Biologist for Wilson and Karnes Counties soon joined us, as did Dr. Wade Phelps, Ann Lang, and Joline Wiley, members of the Kenedy Horned Toad Club. We were also joined by Lelynn Koch a member of the Alamo Chapter of Texas Master Naturalists. Later, we would link up with Pete Kotara from the Karnes City School District Maintenance Department.

Our group soon settled in around one of the larger tables at the Dairy Queen. Some of us enjoyed a bit of refreshment while Lee Ann Linam and Dr. Jill Heatley introduced the objectives of the Texas Horned Lizard Watch and explained the need for conservation and DNA sampling throughout areas where the horned lizards continue to thrive. Next, they distributed resources concerning the threatened little creatures and they outlined the evening expectations for our group.

Soon it was time for a short drive to the area selected for our evening adventure. Ryan Darr and Pete Kotara led us though several buildings and directed us to an open region of sand and sparse grass where they had previously observed lizards. Looking out across the expanse, one could see the ground was dotted with several bare spots along with tiny trails fingerling out through the sparse vegetation. These were the tell-tale signs of harvester ants. As the intense heat of the afternoon began to ease, our members spread out to begin a sweep. I was delighted to see a few ants moving along their tiny path at my feet. The evening held even more encouragement after one of our members spotted lizard scat, a tiny black capsule of neatly packed ant parts tipped with the typical white deposit of uric acid on one end.

Aided by Dr. Jill Heatley, Lee Ann Linam proceeded to examine the specimen before taking measurements and a DNA sample. Soon the little ant-eating organism was released in the edge of a sidewalk. One of our crew reached for the creature and was startled when the little crusty pancake exploded in a flurry. The little lizard ran one way and then another. It jumped up onto the sidewalk and nearly met its demise. As it zipped under foot and tumbled down a set of concrete steps, one of our crew (who shall remain nameless) was caught off guard and needed to step back to catch balance. Fortunately this person was fleet of foot and managed to adjust the step just in time to avoid accidentally stepping on that petite gray blur of unpredictability. All of us were very relieved when the little reptile was safely in hand.

Aided by Dr. Jill Heatley, Lee Ann Linam proceeded to examine the specimen before taking measurements and a DNA sample. Soon the little ant-eating organism was released in
Texas Horned Lizard Labor Day Weekend - continued from page 3

This horned lizard is getting measured by Lee Ann Linam. All lizards were weighed, measured, and had their DNA sampled before being released back to its original hiding place. GPS readings at sight locations were also taken. DNA samples are forwarded to Dr. Dean Williams at TCU who is conducting a study to assess whether genetic differences between populations of horned lizards exist and whether those differences should influence efforts to repatriate or restore horned lizards.

the same location where it was first spotted.

The hunt was on for another tiny horned reptilian. In short order, first one and then another specimen were carefully captured, examined, measured, weighed and sampled for DNA. Occasionally, our members had difficulty trying to determine the correct sex of a specimen, as gender characteristics, normally apparent in the spring breeding season, are often diminished by late summer. The data were recorded and the DNA swabs were labeled for transport to the lab. Each time, our members were very careful to return the little submissive bundle of camouflage to the same spot where it was first discovered.

Data were collected from a total of seventeen Texas horned lizards on that Saturday evening. The variation of size and weight among samples suggested three or more generations of Texas horned lizards were thriving within the territory of our survey. That evening, lizard sightings increased as the temperature dropped and harvester ants became more active. We continued our survey until the waning evening light gave in to darkness.

The following day, we agreed to meet Dr. Wade Phelps, Ann Lang and Joline Wiley of the Kenedy Horned Toad Club for breakfast. Kenedy, Texas is the Horned Lizard Capital of Texas (as proclaimed by the Texas Legislature in 2001). Ten years previous, club members conducted a door-to-door survey to assess horned lizard sightings by residents. Our breakfast group was divided into smaller crews and assigned to canvas specific residential areas of the city. We were to question the citizenry about recent Texas horned lizard sightings and distribute helpful information about the local club and proper conservation practices for the threatened reptiles.

After the exceptional success of the previous evening, most of our group found this experience very depressing. Time and again, residents told us that their last horned lizard sighting was at least two to ten
years ago. Most of the citizens seemed to share our concern for the lizards and the fact that they no longer seemed to be thriving in their community.

The City of Kenedy is not alone. In a conversation with Dr. Jill Heatley and Lee Ann Linam, I learned that many populations of the lizard have disappeared in east and central Texas, and are decreasing in north Texas as well. A decline and disappearance of them in Oklahoma, Kansas and New Mexico has also been noted. The primary cause for population decline is the loss of habitat by agricultural and urban conversion. Other causes have lead to declining populations including over harvesting for the pet trade and the invasion of exotic species, particularly exotic ants which the lizards cannot survive on and which compete with their preferred harvester ants.

Texas Parks and Wildlife Biologist Ryan Darr has suggested that the diminishing population of Texas horned lizards in Kenedy, Texas is probably the result of an assortment of changes, including a loss of habitat through urban development, an influx of red imported fire ant populations, dog and cat population increases in the community, the use of pesticides and over harvesting in the Horned Lizard Capital of Texas for use as pets or curiosities. Like many varieties of lizards, the Texas horned lizard appears to be very attached to its territory once it matures. This characteristic makes its relocation problematic. In other words, it is very difficult for the mature reptiles to successfully adapt and thrive in a new environment. That said, it is important that we be mindful of the plight of our Texas horned lizards and do all that we can to conserve their remaining habitats and populations.

[Editor’s note: For more information on the Kenedy Horned Toad Club contact Dr. Wade Phelps at 1-830-583-9891 and information on the Texas Horned Lizard Watch call 1-800-792-1112 ext. 8062 or go to www.tpwd.state.tx.us/tracker/ ]
History of Kenedy, Texas and the HLCS

By Bill Brooks

The Horned Lizard Conservation Society and Kenedy, TX have a long and storied history. I thought this would be a good time to remember these old times, but I must tell you in 2011 this story does not have a happy ending.

Our history begins back in May 31, 1997. Joe Lang, of Kenedy, contacted Carolyn Todd and asked what to do with all his horned lizards. He was repairing an old house and felt the need to use insecticides around the place to kill termites. He didn’t want to injure the lizards. Carolyn and Wendy Hodges visited this lot, right in downtown Kenedy. This legendary trip produced 33 adult male horned lizards, 28 females, and 15 juveniles. With our permit and the blessings of the TPWD, the lizards were moved just a few miles away to Susan’s (Joe’s sister) ranch.


Wendy made it back to Kenedy in October of 1999. Even though a cold front had just blown through, 10 juveniles were found.

In June 2 & 3, 2000 the word had gotten out about Kenedy. Carolyn Todd, Clare Freeman, Bill Brooks, Bill Davis and his daughter, Leigh Sanders, Nelson Guda and Tammy West went down to for a short meeting. Here we met Carter Snooks and discovered the mayor and city council had just proclaimed Kenedy the “Horned Lizard Capital of the World.” In the vacant lot next to city hall, our horned lizard count was 6 males, 3 females, 1 hatching and 2 dead. We also found 4 harvester ant nests, 22 termite mounds, and 10 scats. At 5th and Nicols Streets we found 2 male horned lizards, 2 spotted whiptail lizards, and 2 geckos. We also found 5 harvester ant nests, 3 termite mounds, and 9 scats. On a small lot with a trailer on it we found 10 female horned lizards showing a remarkable variation in colors. We went back to Sue’s ranch and didn’t find any of the lizards we released there. We spent the night at Anne’s Cottage and found “many” horned lizards in the back yard and adjoining yards.

January 24, 2001 was a red-letter day for horned lizards in Austin. The 77th Legislature proclaimed Kenedy the “Horned Lizard Capital of the World” and Eastland, “The Home of Old Rip, the most Famous Horned Lizard in Texas.”

On September 2, 2001, after an Austin HLCS Board Meeting, Wendy and Bill Brooks took Roger Repp, who was visiting from Arizona, to Kenedy and found “more than a dozen” horned lizards.

The HLCS had a booth at the Aug. 31, 2002 Horned Toad Fun Days. In attendance were John and Cheryl Franks, Carolyn, Clare, Ruthann Panipinto, Jana Morse, Bette and Jim Armstrong, and Bill Brooks. Here we first learned of the project to make a horned lizard mosaic out of buttons. (It ended up hanging in the post office.) We found 13 horned lizards at “4 different sites.” The stats were taken for the TPWD Horned Lizard Watch Program.

From 2003 until 2006, Wade Phelps walked his horned lizard...
trail, taking along tourists when they requested a trip.

On September 4th, 2004, Kenedy held its 3rd annual and last Horned Toad Fun Day. Shortly after this, we lost one of our great Kenedy/ Horned Lizard supporters in Carter Snooks.

I got the above information from our newsletters and as you can see, there are some holes and vagueness in these reports, which are suddenly very important. Wade reports that right around 2008 horned lizards became very hard to find in Kenedy. Some blame this population drop on the droughts Texas has been having. There are still horned lizards in the county, but the population drop in the “Horned Lizard Capital of the World” is very recent and comparatively well documented. This has caught the eye of several TPWD biologists. It looks like this population trend will soon be studied by TPWD and the HLCS. This is the reason that all our old Kenedy records are so very important. If anyone has these records or can fill in some of the blanks in my Kenedy history, I would appreciate getting the information. Keep good records, keep them safe and keep them in good order. You never know how valuable they may be someday.

Horned Lizard Research Grant 2012 Applications

The Horned Lizard Conservation Society is dedicated to protecting horned lizards by documenting and publicizing the values and conservation needs of horned lizards, promoting horned lizard conservation projects, and assisting with horned lizard management initiatives. Towards those ends, the HLCS periodically sponsors research that has direct conservation applications. To learn more about the society and past grants, go to http://www.hornedlizards.org/.

We have $1,000 in grant monies available in 2012; these are typically given as two $500 grants, depending on the number of sound proposals we receive. Preference in one will be given to people not associated with academic institutions; for the other, preference will be given to undergraduate or graduate students. For both, projects that have direct conservation implications, including public education, will receive a higher priority.

To apply, send a proposal detailing the goal of the study, the rationale for it including relevance to conservation of horned lizards, and how your work would benefit from this opportunity. The proposal may not exceed 1000 words, excluding literature references and budget. A preliminary budget should list any other funding sources available (e.g., in-kind contributions) or received. In addition, send a resume or short C.V. (up to 3 pages) for the P.I. and collaborators, and single letter of reference sent to Danny Martin. Submission by e-mail to dannym77@lamar.colostate.edu is greatly preferred. The deadline is March 9, 2012; the decision will be announced by March 26, 2012. Incomplete applications will not be reviewed.

Please renew your annual HLCS membership!!!

HLCS depends on its membership for its conservation and educational presence in the community.

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The HLCS welcomes contributions in any amount you wish to submit and is a 501(c)3 nonprofit organization.
By Alfonso Hernández Ríos and Sandra Fabiola Arias Balderas.
Laboratorio de Herpetología. Instituto de Biología. Universidad Nacional Autónoma de México.

On 2010, we were awarded a Horned Lizard Conservation Society research grant. This grant gave us the opportunity to start a project on a Mexican plateau horned lizard population (*Phrynosoma orbiculare*). This research allows us to expand our knowledge about the biology and status of this species, as well as generate more questions and new hypotheses around this population. We present a brief summary of the activities made and some of the results obtained.

*Phrynosoma orbiculare* is found from approximately 1,370 to 3,350 meters above sea level (masl) and occurs throughout the plateau and mountain ranges of central México and northward along the highland corridors of the Sierra Madre Occidental and Oriental (Sherbrooke, 2003). This species faces continuous habitat loss throughout its distribution, as well as collection for the illegal pet trade and traditional medicine market. Currently it is considered a threatened species by the Mexican government (NOM-ECOL-059-2001). But very little is known about the ecology of this lizard in its natural environment. So it is really important to generate data as a tool in the design and development of future conservation programs for this species, both in and ex situ. During 2010 we made observations on habitat selection, and thermo-regulation in a population in central México.

The study site is about one hour northwest of México City, named “El Vidrio”, in the municipality of Nicolas Romero, in the state of México. The study site is represented by a polygon with an area of about 15 hectares (ha), located along an altitudinal gradient of 2670-2700 masl. There is a rainy season from May to October, and a dry season from November to April. The dominant vegetation is Oak forest (*Quercus grandifolia*), with patches of grass and bushes.

We found a total of 57 individuals: 16 adults and 41 young (<50 mm snout to vent length). Individuals were found between June and October. Most of them were found during June (28 individuals) and July (10 individuals). The observed activity period was from 1000 h to 1800 h, with two activity peaks at 1000-1200 h and during 1800 h. The mean body temperature for all the encountered individuals was 32.43 °C (22.4 - 38.2 °C). The
mean air temperature for all the observations was 25.15 °C (18.2 - 32 °C) and the mean substrate temperature was 28.15 °C (18.47.1 °C). Body temperature was significantly related to substrate (r: 0.547, P < 0.001), but there was not a significant relationship between body temperature and air temperature. The mean body temperature of adults was 32.12 °C, and 32.56 °C for the young. These temperatures did not differ significantly (t test, P = 0.971).

Individuals were found 61.1% of the time in grassland-herba-
aceous areas, 26.1% in ecotone areas, 13% on bare sandy soil and none have been found inside the oak forest. The most frequent microhabitat where a horned lizard was observed was dry sandy soil (39.1%) followed by wet sandy soil (34.8%), and organic matter (21.7%). Just a few horned lizards were seen on organic matter (4.3%), and none on rocky soil.

Most individuals were predominantly found in the open. This pattern has been reported for other species (Hager and Brattstrom, 1997, Phrynosoma blainvillii; Burrow et al. 2001, Phrynosoma cornutum; Powell and Russell, 1985, Phrynosoma douglassi). Open areas offer a mosaic of temperature where horned lizards can regulate their temperature more efficiently than in shaded areas, such as inside oak forest, which is more thermally homogeneous. This is of vital importance because when a lizard is at its optimal body temperature, its ability to perform important functions (e.g. foraging, predator avoidance and reproduction) increases (Huey, 1991).

Areas of bare ground with little herbaceous canopy cover enable horned lizards to maximize sun exposure during the cooler parts of the day, specifically the morning and evening (Burrow et al. 2001). Areas with herbaceous cover, and the ecotone, enable horned lizards to retreat when looking for protection and cooler sites. We believe that the mosaic of bare and covered areas is needed, for this population of horned lizards. Nevertheless, cover could bias the lack of horned lizards detected in the oak forest. More studies incorporating detection probability are needed in order to clarify this hypothesis.

This study area displayed erosion and altered vegetation due to cattle grazing. These factors cause soil compaction and diminish bushes that could be used as refuge by P. orbiculare. Feral and domestic dogs in the area predate P. orbiculare and represent a potential threat to this population.

We thank the Horned Lizard Conservation Society for their support, Fausto Méndez de la Cruz who provided tools and advice, Robert Anthony Villa and Claudia A. Rivera Ríos for the help provided in the translation...
of the manuscript, and Johanna Alvarez and Ysau Munguía for the help provided in the field.

References


Member Highlight: Alfonso Hernández Ríos

By Alfonso Hernández Ríos

I have been fascinated with horned lizards since I was a teenager when Grandmother found an adult female “camaleón” (Phrynosoma orbiculare) in her city backyard and she gave her to me to take care of. I remember her reddish coloration, harsh skin, and dragon-like head—and at the same time she was a kind of cute creature.

It took a lot of effort for me to keep her alive; she did not eat for quite some time and I had no information about the biology of this, or any, Phrynosoma species. I wanted to contact an experienced person, but it seemed as though there weren’t any herpetologists around here that had studied this species. I kept searching and found some papers about Phrynosoma; one of them was written by Dr. Eric R. Pianka. I contacted Dr. Eric R. Pianka looking for some answers to my questions, of most importance, “What does it eat?” I received a fast, gentle and brief answer to my letter: “They eat small ants.” So I started gathering ants, and as the camaleón was growing, my curiosity was growing too.

During this time, I read Dr. Wade Sherbrooke’s Introduction to Horned Lizards of North America and I learned about some of their adaptations, like the rain harvesting behavior, their crypticism and their blood squirting defensive behavior.

Because of this behavior Mexican people call them “Llorasangre” or “Toritos de la virgen” (among other names). Then, I had the opportunity to see a P. orbiculare exhibit the blood squirting behavior in the field, and in time I observed other species squirting blood. This ability really fascinated me.

I also learned about the conservation issues of horned lizards and remember seeing people sell them on clandestine city markets as pets. Sometimes 15 individuals were confined to a 5 gallon terrarium. By this time I had the opportunity to enroll as a volunteer at the university herpetarium where I was studying. During the rainy season several P. orbiculare were brought to the university by people who had bought them as pets. These people didn’t want them anymore because horned lizards are difficult to maintain, or because they didn’t play with kids. During this time I had the opportunity to take care of some of them, a pretty rewarding activity.
I also remembered going to places that were supposed to be inhabited by horned lizards and asking the people if they had seen horned lizards recently and if so, how frequently. They told me that in the past they used to be found, but in recent years it has been hard to see even one horned lizard. This made me think about the conservation status of poorly known horned lizard species in México, which triggered me to do something about their conservation.

The first population I visited was that of *P. orbiculare* near México City which is located on the edge of an oak forest and grassland. I wanted to learn about the thermoregulation, habitat and microhabitat of these individuals so I wrote a grant, and luckily the Horned Lizard Conservation Society provided me with funding. Dr. Fausto Méndez de la Cruz, a researcher at Universidad Nacional Autónoma de México, aided me with some tools and advice.

Besides the tools I have acquired for the *P. orbiculare* project, the grant allowed me to travel that year to Itsmo de Tehuantepec to search for, and luckily find, some awesome *Phrynosoma asio*. While studying the population I observed nest construction and egg laying of two gravid females. I also observed them hydrating themselves by channeling water to their mouths through little furrows between their scales using capillary action, as other northern species do, and presenting different defensive behaviors and body positions.

Now I am working on a master degree at the Universidad National Autonoma de Mexico where my thesis project is about thermal ecology of *Phrynosoma braconnieri* on the highlands north of the state of Oaxaca. In Oaxaca we have been making other observations involving defensive behaviors. We have seen different responses to predators, confirmed blood-squirting behavior, and observed a similar hydration process as seen in *P. asio* and *P. orbiculare* (by capillary action through the scales).

One of the primary concerns about horned lizards is their conservation. The spread of knowledge about them could sensitize people that cohabit with them; most of the time the response of a man, kid, or woman that touches a horned lizard is really positive, despite their previous beliefs (like that they are venomous). So whether I go out alone or with friends I always try to talk with people about this beautiful species. During the past year we have had our very first workshops at elementary schools in the Sierra Juárez mountains of Oaxaca.

Hopefully, next year will be full of *Phrynosoma* encounters. I hope these amazing creatures keep letting us know about their nature.

I want to thank Stefanie Leigh Leland for the help provided in the translation of the manuscript.
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*Phrynosomatics* is now sent electronically.