

Our purpose is to document and publicize the values and conservation needs of horned lizards, to promote horned lizard conservation projects, and to assist with horned lizard management initiatives throughout their ranges.

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## Cloudy with a Chance of Horned Lizards — New Species *Phrynosoma sherbrookei*

by Jared Grummer

We left Seattle for México in June of 2012 with one plan in mind: to find three species of elusive horned lizards (genus *Phrynosoma*). Plans changed. We adapted. The trip evolved. Immediately after leaving the airport, a change in plans. We wanted to make a bee-line

to our hotel to avoid México City traffic, some of the worst for any major city in the world. The moment we left the rental car parking lot with our wheels for the week, a seven-seater minivan, the GPS unit malfunctioned: “Lost satellite reception...recalculating”, became its mantra. This was going to be an interesting trip... Forty kilometers and three hours later, along potholed alleys and horrific traffic on the second longest avenue in the world (Avenida de los Insurgentes), we were at our México City hotel. In the morning, we would meet up with professors and students from the Universidad Nacional Autónoma de México (UNAM) and go to the field to catch some lizards.

Horned lizards belong to the genus *Phrynosoma*,



Sherbrooke's horned lizard (*Phrynosoma sherbrookei*).

one of nine genera within the diverse lizard family Phrynosomatidae. Seventeen species of *Phrynosoma* are currently described (16 prior to this trip) and can be found from the Isthmus of Tehuantepec in the south to southern Canada in the north. Though their

general body plan is fairly conserved, a comparison of horn morphology, tail length, and scalation patterns reveals a high level of morphological diversity within this genus. These lizards are notorious for their incredibly odd anti-predation behavior of squirting blood from their eyes moments before the would-be predator is about to chomp down on our favorite scaled pancake. However, not all species perform this behavior, and this response is generally limited to canid predators. The goal of our trip was to collect genetic samples from horned lizards so that we could reconstruct the evolutionary history of this group using information coded in their DNA. This type of genetic information is crucial for understanding the biology of these enigmatic little beasts.

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108 Cactus Cove  
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512-581-0377  
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---

## Colorado Contact

Danny Martin  
Natural Resource Ecology Lab  
Colorado State University  
1499 Campus Delivery,  
Fort Collins, CO 80523  
dannym77@lamar.colostate.edu

## Texas Contact

Bill Brooks  
108 Cactus Cove  
Paige, Texas 78659  
512-581-0377  
b.brooks@utexas.edu

## Nevada Contact

Jared A. Fuller  
jfuller@unr.edu

## Mexico Contact

Wade Sherbrooke  
wcs@amnh.org

## New Mexico Contact

Tom McCain  
PO Box 53095  
Albuquerque, NM 87112  
tom@httom.com



## Phrynosomatics Copy Editor

Leslie Nossaman  
poppies14@comcast.net

## Phrynosomatics Design Editor

Fannie Messec  
fmessec@me.com

## California Contact

Bruce Edley  
bruceedley@msn.com

**Please Send Membership Applications or Requests for Information to:**

**HLCS  
P.O. Box 122  
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**[info@hornedlizards.org](mailto:info@hornedlizards.org)**

### **Horned lizard taxonomy**

The famous zoologist and taxonomist Carl Linnaeus described the first horned lizard in 1758 (*Phrynosoma orbiculare* = *Lacerta orbicularis* Linnaeus 1758), and if there was ever a “golden age” of horned lizard discovery it was during the 1800s when herpetologists described 14 additional species that are still recognized today. The total was raised to 16 species when Leonhard Stejneger described *Phrynosoma ditmarsii* in 1906. Just because no new horned lizards have been discovered in over a century doesn't mean that their taxonomy has remained stable. For example, the coast horned lizard (*P. corornatum*) has had an exceptionally turbulent taxonomic history since the late 1800s with upwards of 20 taxonomic reappraisals recommending anywhere from one to seven species. The discovery of *Phrynosoma sherbrookei* raises horned lizard diversity up to 17 species.

Fortunately for us, we are able to procure DNA for many most species through natural history museum collections, a resource that has helped countless numbers of scientists for decades. Fortunately for us, some species are not represented in museum collections, which means...fieldwork! For this trip, we had three target species, all endemic to southern México: *P. braconnieri* (short-tail horned lizard), *P. taurus* (bull horned lizard), and *P. asio* (giant horned lizard). Genetic resources for these three species are absent from museum collections for a simple reason: they are not easy to find. To increase our chances of success, Adam put in a lot of legwork before our trip, planning exact localities to visit and coordinating with United States and Mexican researchers alike who have worked on these lizards for many years.

When we left México City for the field, we were five: Dr. Adam Leaché, Dr. Wade

Sherbrooke, Dr. Adrián Nieto-Montes de Oca, Rafael Lara, and me (Jared Grummer). Wade was the director of the Southwestern Research Station of Arizona's Chiricahua Mountains (operated by the American Museum of Natural History) for over 20 years and has been passionate about studying and understanding the natural history of horned lizards since the 1960s. Wade also wrote the quintessential field guide to *Phrynosoma*, “Introduction to Horned Lizards of North America”. Adrián is a professor at UNAM who has worked throughout México on a variety of reptile and amphibian projects since the 1980s. And Rafael (Rafa) was a PhD student at UNAM studying the thermal physiology of many *Phrynosoma* species under Dr. Fausto Mendez de la Cruz. Needless to say, we had a top-notch field team with all the prerequisites for a successful trip. And oh yes, of course we'd stop for other lizards along the way! We are, after all, herpetologists.

Our first destination was Tepanco de Lopez, a small town in southeastern Puebla, where Wade had found five *P. braconnieri* eight years prior. We tested our luck in town with some locals, “Usted tiene tacos de cameleón?”. “No”, she said, no Phryno-tacos here, with an awkward chuckle. We made our way to the site via Wade's memory, passing cinderblock buildings, stray dogs, anthills, and active farms. We reached the site by 4 pm, and we all bounded from the car with cheerful optimism, walking excitedly on our toes, alert for any subtle movements on the ground. The habitat was characterized by white soil and rocks beneath a variety of cactus, *Agave*, and *Acacia* species, with the flora changing abruptly with the direction of the slope. After 2-3 hours roaming the hill, we returned to the car, disappointed and frustrated; no *Phrynosoma* today. We did, however, catch a little *Tantilla* (black-headed snake) and *Sceloporus jalapae* (Jalapa spiny lizard). Back at the hotel, we commenced our nightly routine of specimen preparation, note keeping, and relaxation.

Later that night I woke up to a regular Seattle sound: rain. “I hope this won't hamper tomorrow's herping”, I thought. After breakfast accompanied with fresh squeezed orange juice, we headed back to the same site under a grey sky. The sun never broke for more than three minutes, and the wind was moderate; the lizards were hunkered down. After roughly

three hours on the hill, we collected three *S. jalapae* and a *Salvadora* (patchnose snake) that Adam spotted on the ground. Still no *Phrynosoma*. It was time to try our luck elsewhere.

Our destination was El Jardín Botánico, a nature preserve known for its high cactus diversity, located about 18 miles due north of our previous site. Rafael had good word that *P. taurus* and *P. braconnieri* are “easy” to find here. Just the morale booster we needed! Within 50’ of the car, parked at the visitor center, we found our first *P. taurus*! Well, they were in tanks in the visitor center, three females and two males. Seeing them in this context did not make the site any less spectacular. Their swept back temporal horns as seen from above reminded me of the Star Trek symbol. Unfortunately, there was a misunderstanding and we were not allowed to collect in the preserve, which made sense and we of course abided. However, the habitat looked so spectacular that we couldn’t pass up the opportunity, so we tried our luck outside the Jardín at a nearby locality.

The hillside we scoured was full of a great diversity of plants, including great thick *Yucca* (approaching 4’ at the base) and a variety of other plants full of spines, thorns, and prickles; “Every plant is out to kill you”, Adam said. Goats traveled this hill frequently, and we followed their trails to avoid the incessant scrapes and cuts from the thorny outstretched branches. In addition to two *Sceloporus gadoviae* (Gadow’s spiny lizard) that we caught here, Adrián collected some *Agave* spines in his palm when diving after what he believed to be a *Phrynosoma*. After tallying up another zero point day for the herpetologists, we stopped at a local restaurant for some deep-fried caterpillars (cuchamá), micheladas (a beer added to lime juice and chili powder), and a Mexican Burt Reynolds look-alike singing on TV.

Day 3: we discover that we are in the midst of hurricane Carlotta. “Oh yeah, that would explain all the great weather we’ve been having!”, I thought. A decision had to be made: sit in the hotel room here in Tehuacán and wait out the weather (“The sky looks lighter grey now, or is it just me?”), or drive south to Guerrero and hope-

fully experience more friendly weather. We knew we had *P. asio* and *P. taurus* waiting for us in Chilpancingo, Guerrero, because a student was using them for thermal tolerance studies in the lab. Furthermore, Wade wisely pointed out that you never find anything when you sit still. The decision was made: to Chilpancingo!

The 4.5 hour drive on the cuota was pretty in a lot of spots, but rainy in most. Shortly after sunset, a small plague of large white moths descended upon the highway, perhaps drawn to the headlights. Once in Chilpancingo, the car needed fuel, and so did our bodies. We stopped at the first taco stand we saw and tried our luck with some tacos de cabeza, not to be confused with tacos de sesos...brains. Dos sopes, cuatro tacos, y una jamaica later, we were fueled up and ready to stretch our legs and do some late night herpin’!

With the wet weather, we were certain to find some amphibians, while also being hopeful to find *Anolis* (anoles) for a long-term project Adrián has been working on. Driving through the dripping rain, we saw well over 50 *Spea multiplicata* (Mexican spadefoot frogs) on the road. At our first roadside stop, we could hear the mellifluous sounds of *Spea* and *Syrrophus pipilans* (eleutherodactylid frog) choruses in the distance. We hiked a little trail into the forest, where we spotted the eyeshine of many moths, and watched male *S. pipilans* singing from the top of epiphytes, but no *Anolis*, so down the road we went.

Though we have the eyes of herpetologists, our search image is often triggered by arthropods, especially large arthropods. Adam found a big vinegaroon (order Thelyphonida) on a roadcut, an arachnid named for its ability to spray an acetic acid substance in defense. Even with a mission at hand, the naturalist has to stop and appreciate such beauty. Back to the *Anolis*. *Anolis* are most easily seen at night by spotting with a headlamp, as their light-colored bodies reflect the light and stick out against the dark foliage. Dead leaves, moths, and broken sticks can all be mis-identified as *Anolis* with a little bit of over-excitement. With no signs of *Anolis* after nearly two hours of searching, it was time to head back

to the hotel. But on the walk back to the van, the highlight of my night was crawling on the road-cut, *Coleonyx elegans* (Yucatán banded gecko)! I was not anticipating finding a gecko here, so this was a great way to end the night.

Today's weather report showed a change in weather, the clouds were breaking. We were hopeful, we felt a bit of luck in the air. Marcos, Diego, and Antonio, three students studying *Phrynosoma* at the UNAM in Chilpancingo, came to our hotel the following morning at 8:00am to take us to a known locality of *P. asio* and *P. taurus*: inside Marcos' house. In his apartment, he had 11 *P. asio* and 7 *P. taurus* that he had collected, performed tests on, and now needed to go back to the field. The first impression one gets of these animals is pure delight. They are so fascinating. You feel like you are looking back in time when examining their horns, scales, and eyes. While photographing these lizards outside of our hotel in the scattered sunlight, some local children told us they had just seen one up the hill. "Sí, sí, un cameleón!" If there is one thing I've learned from this trip, it is to befriend the locals, and listen to them. They will tell you where to go, what to do, and how to find what you are looking for. They might even give you a beer, too.

Up the hill we went, past pigs, turkeys, and cattle. There were a few cactuses and woody plants, but most of the hillside was grazed and beaten down from livestock. Within a couple minutes, "Tengo uno!" – Marcos had found a *P. asio* adult at the base of a cactus! Two minutes later, Antonio found three juveniles right next to each other. Three minutes after that, I found a nice male. While posing for a photo with a male in one hand and a female in the other, the male started bobbing his head, a sort of "How you doin'?" in the female's direction. We placed both on the ground, and the male ran over immediately to the female and mounted her. We watched the rarely witnessed act of *P. asio* copulation for the next 15 minutes. Following some impromptu *P. asio* post-copulatory behavioral observations that Wade was curious about, we headed across the road to try our luck with finding *P. taurus*.

The sky turned back to grey in the mid-afternoon, but the locals we were with remained



Giant horned lizard (*Phrynosoma asio*) in Guerrero.

hopeful. We searched the gravelly road under the telephone wires in the shrouded daylight. "Diego!" Antonio had found an impossibly cryptic juvenile *P. taurus* on the gravel near the road, and Diego was summoned to take the air temperature, substrate temperature, and cloaca temperature, of every *Phrynosoma* that was encountered. Amidst the grey weather (air temp ~74F), we found about six more *P. taurus* in this short, deciduous forest. The disruptive dorsal patterning of this species works incredibly well at camouflaging these lizards to the forest floor of dead leaves and dark soil. And they don't move, not even if you step near them, or on them. Did I mention that there aren't many in museum collections? Yes, they are hard to find. But, the sun had come out for a little while. The lizards were out. Two out of three target species were caught. Guerrero was good.



A cryptic juvenile bull-horned lizard (*Phrynosoma taurus*).

The next morning, we drove to a locality about 50 minutes outside of Chilpancingo to find a population of *P. taurus* that local herpetologists

*Continued on page 6*

told us looked distinctly different from other *P. taurus* populations. These individuals were smaller overall, with a different horn configuration, they told us. This locality of distinct *P. taurus* was a little higher in elevation, with oaks amidst farmland. The habitat was a grassy south-facing hillside with exposed orange soil and rocks from erosion. "Diego!" We had found our first "*P. taurus*" of the day. "Diegoooooo!!" Indeed, just as we were told, these "*P. taurus*" were noticeably different. Had we caught a juvenile? Eight more were found within the hour. No, they all looked very similar. The temporal horns were shorter and pointed outward versus longer and swept back. Noticeable quantitative differences were present as well, namely, a complete lack of enlarged postanal scales in males. The coloration of individuals in this population is highly variable and matches the predominant soil color very well at this locality. Needless to say, we were excited about the very real possibility that this population represented a new species of *Phrynosoma*! However, this population is sadly in jeopardy. With farms in all directions, it is conceivably only a matter of time until this habitat is converted into agricultural land. Many other populations in the area face the same tenuous future. Skip to the bottom of this article to find out the results of the morphological and molecular species delimitation analyses.

Despite the weather, we were having a successful trip. One out of three target species remained:

*P. braconnieri*. This species is arguably the most elusive and secretive *Phrynosoma*, along with the poorly-studied *P. ditmarsii* in northern Sonora. But we had learned how to find these lizards: talk with the locals. A student from UNAM in México City was studying the thermal biology of *P. braconnieri*, and he had some specimens back at his house. Alfonso has been successful at finding and capturing *P. braconnieri* in the field, he figured he'd found over 100 during a couple months of fieldwork. He showed us videos at his house that he had taken demonstrating the ability of *P. braconnieri* to move water from their dorsum to their mouth through some sort of capillary action or active transport. Though researchers know of this phenomenon, it is not well studied. Picking up horned lizards from peoples' houses is not how we envisioned our "field" collecting would go, but with such a short trip and real world collecting difficulties, we were happy to check off our third target species.

One final obstacle, potentially the biggest, lay in front of us: specimen export. Exporting specimens from any country is no small feat, but thankfully we had Adrián, who was determined to get these specimens out with Adam. After Adrián filled out paperwork for over two hours, we headed to the airport to get the green light from PROFEPA (Procuraduría Federal de Protección al Ambiente), the government agency that controls all environmental/natural exports.

The PROFEPA agent plugged away at the computer for nearly an hour, but it seemed that Adrián had filled out something incorrectly. There was no way around it, we had to re-fill out the paperwork. The agent was very nice to us, so he was rewarded with a Krispy Kreme sprinkled donut and Starbucks coffee, which he happily and quickly dispatched. We did not receive the okay we were looking for, we were frustrated; it was time to watch a UEFA cup fútbol game.

We returned to Adrián's house following the game (Portugal 1, Czech Republic 0) to re-prepare the specimen paperwork. On the second



Wade Sherbrooke at the type locality of *Phrynosoma sherbrookei* in Guerrero, Mexico. Adam Leaché is in the foreground holding three specimens of *P. sherbrookei*.

round, Adrián whizzed through the paperwork (the application is timed, one hour) while Adam and I wrapped and packed the specimens for the (hopeful) journey to their new home at the University of Washington's Burke Museum of Natural History and Culture. In the morning, the agent asked to see the new paperwork and a look at the specimens. "Bien, bien." All was good, Adam had the green light! Sorry, but no more donuts today. At 6:35am, Adrián and I left the airport. Everything was in place, Adam was on his way to Seattle with three species of horned lizards.



Field crew in Guerrero at the type locality of *Phrynosoma sherbrookei*.

After the trip, students in the Leaché Lab collected molecular data (three mitochondrial genes and six nuclear loci), while researchers in the Nieto-Montes de Oca Lab in Mexico collected morphological data of the new species. Thorough analyses on both datasets revealed that "*P. taurus*" individuals we collected outside of Chilpancingo, Guerrero in fact deserved recognition as a new species! The discovery of this species, recently published in the journal *Herpetologica* (Nieto-Montes de Oca et al., 2014) is particularly exciting because it doesn't simply represent a "splitting" of a previously recognized species into two. Rather, it represents a previously unknown-to-science lizard population. The new species, *P. sherbrookei*, owes its specific epithet to the

*Phrynosoma* enthusiast Wade Sherbrooke, who has devoted much of his life to furthering our scientific understanding and natural history knowledge of horned lizards.

References:

Nieto-Montes de Oca, A., D. Arenas-Moreno, E. Beltrán-Sánchez, and A. D. Leaché. 2014. A new species of horned lizard (Genus *Phrynosoma*) from Guerrero, México, with an updated multilocus phylogeny. *Herpetologica*, 70:241-257.

Jared, the author, is with the Department of Biology and Burke Museum of Natural History and Culture, University of Washington, Seattle, Washington, USA



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The HLCS welcomes contributions in any amount you wish to submit and is a 501(c)3 nonprofit organization.

# HLCS Booth Sitting Reports

By Bill Brooks

I sat for a couple of HLCS booths in April. I pulled double and triple duty at these events. On April 12th I was at the new San Marcos, TX Wild Rice Festival. A friend who used worked with me at McKinney Roughs LCRA Park invited me to the festival and I worked the booth with friends from the park.

Beside my HLCS exhibits and handouts, I brought a couple of my pet nonvenomous snakes. They were great hits. I also took a kid's fish casting game called Back Yard Bass that I use in my TPWD lean to fish classes. Another volunteer manned that station.

It was a lovely day on the banks of the San Marcos River where wild rice was growing. I got a \$5- donation for the society, but then my Ball Python crawled into our donation jar and refused to come out. That put an end to the donations for the day. I met a number of lovely people.

On April 26 I was at the Wildlife Extravaganza in Smithville, TX.



*A young girl showing off the horned lizard mask she obtained at the Smithville Extravaganza. Photo by Brad Phair.*

I brought our HLCS displays and handouts and a fishing buddy manned my Back Yard Bass station. Again it was a lovely spring day and I met lots of fine people. The society made \$14 in donations.

I was surprised and pleased to run into one time HLCS member, Marcia Jenkins. In the early days of the HLCS Marcia drew the black and white horned lizard graphic on the top of our newsletter. It now graces our caps, a t-shirt, and our bumper stickers. As much as anything, this graphic is the

logo for the society. What fun it was talking to Marcia after all these years. It just goes to show that you never know who you will run into at a booth-sitting event.

I encourage all members to take some time out of their summer and represent the Horned Lizard Conservation Society at a nature festival near you. It is a fun way to pass the time, meet new people, and spread the word about the shrinking populations of horned lizards.



## Old Rip is Calling...

By Bill Brooks

I'd like to remind everyone that Saturday October 4th is the Old Rip Festival in Eastland, Texas. Anyone who cares about horned lizards should be fa-

miliar with Old Rip. If you don't know the legend you should look it up.

This festival is the largest outreach and sales event of the year for the HLCS. Bette & Jim

Armstrong and Bill Brooks will be working the booth but we could use some more help. The more people we have, the more people we can reach. If you can help, please contact Bill Brooks [b.brooks@utexas.edu](mailto:b.brooks@utexas.edu).





# Horned Lizard Research Grant 2015 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 annually sponsors research that has direct conservation applications. To learn more about the society and past grants, go to <http://www.hornedlizards.org/>.

We will be offering grants again in 2015. In the past, priority has been given to projects that have direct conservation implications, including public education.

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 up to ten references. Also include a preliminary budget with any other funding sources available or received for your project. In addition, send a short resume or CV (up to 3 pages) for the lead applicant and have a single letter of reference sent to Megan Lahti: [megan.lahti@gmail.com](mailto:megan.lahti@gmail.com). The deadline is January 1, 2015. The decision will be announced by January 31, 2015.



## Texas HL License Plates Support Conservation

By Carly Drees

The Horned Lizard vehicle license plate, the first of the Texas Parks and Wildlife Department's four conservation license plates, was introduced in 1999 and quickly became one of most popular specialty license plates in Texas. In 2006, it was the #3 best selling specialty plate in Texas.

You can show your support for wildlife by putting a Horned Lizard license plate on your Texas vehicle. Each plate costs just \$30, with \$22 of that fee going directly to benefit wildlife diversity and to help protect native non-game species such as the Horned Lizard. The license plates can also

be personalized with up to five characters for an additional fee of \$40. All of Texas Parks and Wildlife's four conservation license plates can now be purchased online or at your county tax assessor-collectors office. To order your plate today or for answers to frequently asked questions, visit [www.conservation-plate.org](http://www.conservation-plate.org).

The other Texas Parks and Wildlife Department conservation license plates include the Bluebonnet plate which benefits state parks, the Large-mouth Bass Plate which benefits bass fishing, and the White-tailed Deer plate that benefits big game hunting.



## President's Message

By Bill Brooks

New and exciting information broke in June. I had heard the rumors but the 70(2) June edition of *Herpetologica* published a description of a new horned lizard species. Adrian Nieto-Montes DE Oca, Diego Arenas-Moreno, Elizabeth Beltran-Sanchez, and Adam D. Leache authored the physical and genetic account of this new species found in Guerrero, Mexico.

Author, Dr. Adam Leache is an HLCS lifetime member.

That is the first half of the exciting news. The second half is that this new species has been named *Phrynosoma sherbrookei*. Yes. The new horned lizard is named after my friend and longtime HLCS member and supporter, Wade Sherbrooke. Many of you have met Wade and I'm sure we all agree that this honor could not be bestowed on a more deserving person.

For the original paper see: <http://hljournals.org/doi/full/10.1655/HERPETOLOGICA-D-13-00077>



# Horned Lizard Survey near Terlingua, Texas

By Kristen Munson

Over Memorial Day weekend, eleven members of the Horned Lizard Conservation Society drove to Terlingua Ranch, a swath of more than 200,000 acres of Chihuahuan high desert laced with 1,200 miles of unimproved road. For reference, the area is larger than the state of Connecticut and dotted with about 5,000 private residences. Much of the region is unsettled and property lines stretch across dry riverbeds, bentonite flats and mountain peaks. In other words, there is plenty of room for horned lizards to thrive.

Most homes there, including that of Tanya Phillips and Chuck Reburn, hosts of this year's horned lizard count, operate off the grid. They use a catchment system to collect water and solar panels keep the lights running and showers warm. (Not that you need one after an afternoon scouring the desert in search of tiny dinosaurs.) For some conservation society members, the 2014 count would be the first time they saw a horned lizard in the wild.

The first morning of the count, the group assembled on the porch for coffee. Some folks climbed a rocky slope on the edge of the property with steaming mugs to watch the sunrise over Mexico. Buoyed by a breakfast of scrambled eggs, bacon, potatoes, Brie and honey combs from Tanya's



Roundtail horned lizard. Photo by Tanya Phillips.

beehives in Austin, the team fanned out across the brush. They ambled slowly past patches of skeleton-leaf goldeneye and guayacan, hoping to spook a lizard into motion.

It finally happened after about 90 minutes in the field. Bruce Edley was the first to spot a roundtail horned lizard resting amidst the rocks. The male lizard measured 11.5 cm from tail to nose and weighed 9.08 grams. He was found at an elevation of 1,195 meters with a ground temperature reading of 114.5 degrees.

Twenty minutes later, Perry Bartholow located a second roundtail a scant 20 feet away. She was 8 cm long and weighed just over 9 grams. The ground temperature reading was a balmy 116.7 degrees.

While the pair would be the only horned lizards spotted this

trip, the sightings kicked off a successful weekend of herping.

Later in the afternoon, Tanya led a tour of her relatives' homes in the area. One of her aunts built a sanctuary where birders from across the country come to see what they can see. During the group's visit to the site, garter snakes swam in the wetlands and whiptails raced into the brush. Just in time for lunch, a 5-inch centipede dropped from the patio umbrella onto Bruce, who handled the incident with mere amusement and grace. Some other folks present may or may not have screamed.

After sunset, Bruce coaxed several members to don headlamps and head out to scan the hillsides for snakes. This would become a nightly ritual over the course of the long weekend. Fourteen species of frogs, lizards and snakes were ob-



Survey group is out surveying. Photo by Dayton Crites.

formations. The hike wound past a small spring where pond frogs swam undisturbed and was dotted with Turk's head cacti. Whiptails ran underfoot. Afterward the team stopped for a tour of the Terlingua mine and popsicles. One could call it a successful round of fieldwork.

Participants included: night herping crusaders Bruce Edley and Futha Al Al-Abdulrazzag; long-time members Gary and Clair Freeman; newlyweds Perry Bartholow and Saadia Mai; hosts Tanya Phillips and Chuck Reburn; newcomers Dayton Crites and Kristen Munson; and president and fearless leader Bill Brooks. Hope y'all can join us at the next survey.

served altogether, including red-spotted and Great Plains toads, Texas Banded and Reticulated Geckos, and snakes such as the Trans-Pecos rat snake, western ground snake and western diamondback rattlesnake, and Texas lyre snake.

In between counts, Tanya and Chuck kept the crew well fed and much entertained. They led a hike to Indian Canyon and into a fringe portion of Big Bend National Park. The route was once traveled by native populations hundreds of years ago and evidenced by pictographs and petroglyphs they left in shaded portions of rock



Survey group from left to right: Chuck Reburn, Tanya Phillips, Dayton Crites, Kristen Munson, Bill Brooks, Gary Freeman, Clare Freeman, Saadia Mai, Perry Bartholow, Bruce Edley, and Futha Al-Abdulrazzag. Photo by Dayton Crites.



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