



## **Crown of the Sonoran Desert – the Regal Horned Lizard (*Phrynosoma solare*)**

By Thomas R. Van Devender and Ana Lilia Reina-Guererro.  
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We were making a list of the plants in Sonoran desertscrub west of Santa Ana, Sonora, Mexico. Underneath a desert ironwood tree (*Olneya tesota*), Ana Lilia saw what looked like an earthstar fungus (*Geaster*). It was a bleached skull of the Regal Horned Lizard (*Phrynosoma solare*) with its full crown of thorns! This species is found from central Arizona and extreme southwestern New Mexico south through Sonora to northern Sinaloa. It lives in Sonoran and Chihuahuan desertscrub, desert grassland, foothills thornscrub, and tropical deciduous forest.

When Regal Horned Lizards are encountered, they usually retreat under a shrub, where their cryptic coloration makes them very hard to see. Their ground color can be light gray, dark gray, tan, brownish, or reddish, matching soils in different habitats. They can be uniform or have several different patterns. Sometimes there is a white mid-dorsal stripe on the back. Often the center of the back has a broad oval whitish area. This area can be unmarked or crossed by two or three rows of dark spots or bands. There are usually dark nuchal blotches on the sides of the neck. The horns can be a contrasting pink, and the parietal eye is usually in a white spot.

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## **GOT NEWS?**


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Different color patterns and skin details of Regal Horned Lizards,

Like many horned lizards, *P. solare* occasionally squirt blood from the eyes. This ‘blood’ is full of chemicals including formic acids from ants. Squirted into the mouths of lizard-eating kit foxes (*Vulpes macrotis*) and coyotes (*Canis latrans*), it is a very effective deterrent. The predators shake their heads, spit out the horned lizard, and never touch one again.

In Phrynosoma, mountain species like the Greater Short-horned Lizard (*P. hernandesi*) and the Rock Horned Lizard (*P. ditmarsii*) have more generalized diets, eating beetles and grasshoppers as well as ants. They have deeper jaws and multi-cusped teeth like *Sceloporus*. The Regal and Flat-tailed (*P. mcallii*) horned lizards specialize in eating ants. Their jaws are slender with reduced peg-like teeth. Regal horned lizards at harvester ant (*Pogonomyrmex spp.*) nests are like sumo wrestlers whirling in all directions to eat approaching ants. It is always a treat to occasionally see these coronas del desierto (editor’s note: crowns of the desert), but the presence of ant-filled feces tells us that they are more common but hidden. 



Bloody eye. Red harvester ants (*Pogonomyrmex barbatus*), Note the slender mandibles.

Photos by Wayne and Tom Van Devender and Stephen L. Minter.

# Emerging Technology: Using Harmonic Radar to Track Hatchlings in the Field

By Jennie Mook,

Cooperative Wildlife Research Laboratory, Southern Illinois University Carbondale



“Old diode” - A Texas horned lizard hatchling with the initial reflector design that included copper wire and a diode (lizard is sitting on a quarter coin)



“New diode” - A juvenile horned lizard with the most current reflector design that allows for detection distances up to 5m away.




“New diode collar” - Different reflector placements have been and continue to be tested like this collar to improve the efficacy of this tracking method.

Understanding habitat use, movement patterns, and survival rates of a species often requires the ability to remotely track individuals in the field. This is particularly crucial for imperiled species such as the Texas horned lizard (*Phrynosoma cornutum*), which has suffered significant declines and local extirpations throughout its range. Texas horned lizards are frequently monitored with radio telemetry; however, only older juveniles and adults can be tracked given the size constraints of battery operated radio transmitters. Thus, because hatchling horned lizards weigh less than a gram upon emergence, little is known about the movements and survival of this life stage. This is concerning given previous research has found enhancing survival, particularly for hatchlings, is vital for increasing population growth rates (Wolf et al. 2014). Fortunately, harmonic radar has emerged as a way for researchers to track tiny organisms and our study hopes to employ this method to track horned lizard hatchlings, better informing our understanding of this life stage.

While harmonic radar has been used successfully in a variety of taxa including frogs, salamanders, and insects, it has not been previously used for horned lizards. Harmonic radar works through the use of a hand-held instrument that serves as a transmitter and a detector. The transmitter emits a signal which is then reflected by a nonlinear conductor, such as a diode, which is attached to the organism. The detector transforms the signal into a sound that allows the researcher to find the animal. The small size of the reflectors (>0.05g) makes them ideal for working with very tiny organisms, such as freshly emerged hatchlings (>1.0g). Preliminary results suggest detection distances of up to 15m, and the current project seeks to improve these numbers.

Spanning the last decade, several research projects on Tinker Air Force Base in Oklahoma have provided background data and examined approaches to maintaining a viable population of Texas horned lizards. This study extends that research by employing a novel, low-tech tracking method to monitor an understudied, but crucial, life stage of a species that is in danger of continued population declines. Specifically, I will use harmonic radar to quantify hatchling survival rates and mortality-specific details, as well as estimate daily movements and home range sizes.

This research will allow us to fill in the gaps in knowledge regarding the hatchling life stage, which will ultimately inform better conservation and management decisions both on Tinker Air Force Base as well as throughout their range. This work also aims to improve the efficacy of using harmonic radar as a method to track other small herpetofauna. Thanks to the generous support of the Horned Lizard Conservation Society, I am able to purchase the reflectors needed to track hatchlings and gather data about their movements, survival, and the efficacy of using harmonic radar to monitor hatchling horned lizards. 

## 2016 Grant Recipient Research Summary

In 2016 HLCS awarded a grant to support conservation-based research to Jennie Mook. The following article describes the plans for her interesting research. We look forward to hearing the final results of this worthwhile project by this researcher!

# HLCS Educational Booths 2016

By Bill Brooks

It's that time of the year again. Spring and Summer are great times for nature festivals. If you would like to sponsor a booth for the HLCS, please do. We will be able to supply you with some handouts, a banner, and perhaps, depending upon where you are located, some exhibits.

The HLCS had a booth at the Lone Star Rattlesnake Days festival April 30- May 1, 2016. It was held at the Travis County Expo Center in Austin, Texas. Rattlesnake Days are sponsored by the Rattlesnake Preservation Trust, a 501(c)(3). It was an educational festival and NOT a rattlesnake round-up!

The HLCS always has a booth at the Old Rip Festival in Eastland, Texas. It will be held on Saturday October 1, 2016. Here are some pictures of Bette Armstrong and Bill Brooks at our 2015 booth at this event. (Photos by Jim Armstrong.) Note the Horny Toad Hats Bette made. Her newest creations are horned toad puppets. They are wonderful!



If you would like to help with these booth sitting events please contact Bill Brooks, [b.brooks@utexas.edu](mailto:b.brooks@utexas.edu), 512-581-0377, or just drop by anytime to say howdy. 🦎

# Horned Lizard Research Grant 2017 Applications

By Leslie Nossaman

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 2017. 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 Tim Tristan [exoticvet@yahoo.com](mailto:exoticvet@yahoo.com). The deadline is January 1, 2017. The decision will be announced by January 31, 2017. 🦎

# HLCS Horned Lizard Survey Opportunity Near Big Bend National Park

By Tanya Phillips



Photo by: Devin Erleben


This survey is planned for May 27-30, 2016 at the private ranch of Chuck Reburn & Tanya Phillips - <http://tresagavesranch.com/tres-agaves-ranch/>

Limited shared lodging will be available free on a first to reserve basis with no private rooms or baths. There are two cabins with multiple beds in each room, one indoor bathroom with shower and one outdoor shower. Home runs on solar energy with rain water collection with gas water heater, heat, cooking, and fridge. There is no air conditioning.

Six meals are available with three breakfasts and three dinners. There is a fee of \$75 pre-paid to Tanya Phillips. There are no partial meal deals or lunches. Meals begin Friday night and end Monday morning.

You can also camp or bring a self-contained RV, with NO HOOKUPS, NO ELECTRIC or WATER available. The 2 nearest motels are 1) Terlingua Ranch Lodge or 2) Longhorn Ranch Motel. The nearest town is Study Butte which is 15-20 miles away (45 minute drive).

High clearance vehicles are recommended to get to the ranch and on the surrounding roads.


The survey is for HLCS members only, so you will need to either join first or already be a member to attend. Check the HLCS website for membership details: 

## June Mason Mountain WMA Horned Lizard Survey

By Carolyn Todd

Currently there is one remaining survey scheduled for 2016 year. It will be held at the Mason Mountain Wildlife Management Area in mason, TX. Texas Parks and Wildlife Department will be leading it on June 25 as this survey will assist TPWD in collecting data regarding their horned lizard release sites on the property.

There is a possibility of additional surveys being scheduled. Check the next newsletter for possible added survey locations and dates.

We will need a final list of participants one week before the planned excursions to arrange carpooling and the caravan meeting location. We ask that all participants sign the liability form available at the survey site for signature. Please note that landowners have requested that children under the age of 12 years are not included due to possible safety concerns. Look for future notices for possible additional surveys. 

# About horned lizard surveys with the HLCS

*By Carolyn Todd*

The HLCS mission is to study, document and publicize the value and conservation needs of horned lizards and to promote horned lizard conservation projects and assist with horned lizard management initiatives throughout their ranges.

In terms of promoting this mission and providing educational opportunities in the field, HLCS volunteer survey coordinators conduct surveys on private property, state, and national parks periodically when requested and scheduled. Locations, times, caravan meeting spots and phone number contact will be sent to members who email the survey coordinator no later than one week before the scheduled survey (see article titled Horned Lizard Surveys Planned for 2016).

Depending on the site selected, a short discussion will be presented by the survey coordinator regarding the objectives, safety concerns (if any) and methods of the survey. Each lizard will be weighed and measured for survey data and promptly released where they were found. No collection of any reptile or amphibian will be allowed in alignment with park and private property rules and policies. Venomous snakes may be present; caution will be encouraged to all who participate.

## Requirements:

1. The surveys are only open to current and life members. Proof of membership will be checked via HLCS or member records.
2. No children under the age of 12 are allowed for safety reasons.
3. All participants will arrive and leave as a group. Make plans to stay the entire length of the survey. People exiting at different times are not acceptable or considered safe by private property owners and most parks unless previously arranged with the survey coordinators.

## Highly Recommended:

1. Participants must be prepared for heat and cactus environments by wearing appropriate protective clothing (hats, long sleeves, and long pants), we highly recommend that each participant will have enough water for one day in the heat, snacks might be helpful.
2. Bring bug spray if desired, for fleas, ticks, and mosquitoes.
3. Sun tan lotion may be needed.
4. Binoculars and cameras are also recommended. Each survey will be documented in the HLCS newsletter; contributions in text/photos are welcomed.

Most sites are conducted in a natural site that can be rocky, unstable, and rapidly changing elevations. Smooth and flattened trails are rarely available.

# Board of Directors seeking a new Director-at-Large

*By Leslie Nossaman*

The following is the position description: The Director-at-Large shall be responsible for development of special projects as assigned by the Board, particularly related to integration of scientific knowledge and conservation issues – this position has been filled by a professional biologist/ecologist in the past. One special project is to head the grant committee. Whenever possible, nominees for this position should be drawn from states not otherwise represented on the BOD. Contact Tim Tristan [exoticvet@yahoo.com](mailto:exoticvet@yahoo.com) for more information or if you are interested.



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