HORNED LIZARD CONSERVATION SOCIETY
Post Office Box 122, Austin, Texas 78767

Phrynosomatics

The Newsletter of the Horned Lizard Conservation Society

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.

Volume 14, Issue No. 1 **FEBRUARY 2009**

Translocation of Texas Horned Lizard: A Viable Conservation Option

by Vic Bogosian III

Texas horned lizards are well-known for their interesting behavioral traits, such as puffing up and squirting blood from their eyes to deter predators. Unfortunately, they are also well-known for their conservation status across much of their range, having experienced population declines in many areas. Possible causes for these losses include population declines of their main prey (harvester ants) through either direct competition with imported red fire ants or indirect mortality from pesticide application, habitat loss and fragmentation, and over-collection for the pet trade. These pressures are not constant throughout their range, and in some areas may be countered with effective legislation and protective measures. However, some pressures (i.e., habitat loss) may be unavoidable, and in those cases other conservation measures may be necessary.

Female Texas horned lizard excavating nest chamber. Dirt is being thrown backwards. Photo was taken June 13, 2008 by Vic Bogosian III.

In recent decades, an increasingly common response to habitat loss for reptiles has been to translocate individuals from at-risk locations to areas where there are no immediate risks. While these efforts are often accepted by the public as appropriate responses to threats of population losses, research indicates that the chance of translocated individuals establishing new populations are low, and translocations often fail within the first decade of movement. The causes for these failures are not entirely understood, but may be related to improper human selection of translocation sites.

Researchers at Tinker Air Force Base (TAFB) and Southern Illinois University Carbondale are faced with a scenario where a stable population of Texas horned lizards will be impacted by new housing construction. While environmental impact analysis by Natural Resources personnel on TAFB succeeded in limiting habitat loss away from areas of high lizard use, portions of the lizards' range will still be affected. In the face of certain loss of some portion of that population, TAFB Natural Resources personnel decided to translocate lizards onto the best available habitat where no developments were planned.

We are employing a method of habitat modeling to attempt to place lizards in the most favorable

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Translocation of Texas Horned Lizard—*continued from page 1*

habitat at our translocation site, and are monitoring their movement, behavior and survival through the use of radio telemetry and geographic information system (GIS) technology. During 2008, 17 lizards were translocated and monitored, and will continue to be monitored in 2009 to determine overwinter survival and reproductive success. While the loss of habitat is unfortunate and sometimes unavoidable, these research efforts will help researchers and conservation authorities in determining the best options available for mitigating habitat loss and conserving horned lizard populations.

Use of Ground Penetrating Radar in Wildlife Research: a novel, non-invasive technique for estimating the depth of hibernating horned lizards beneath the ground surface

By Daniel J. Martin, T. A. Scott Newbold, and Brianne Hamm

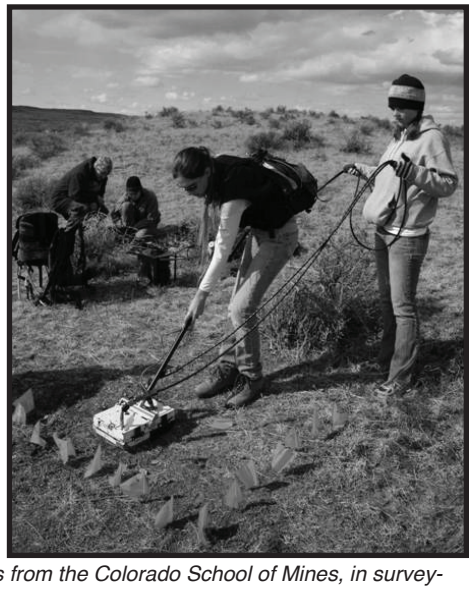
Project Update, December 2008
We examined the efficacy of using ground penetrating shortwave radar (GPR) to estimate the depth of hibernating horned lizards that have been tagged with radio-transmitters. GPR is a non-invasive technique widely used for subsurface exploration and imaging with centimeter-scale resolution (Olhoeft 2000).

Our research was conducted at the USDA Central Plains Experimental Range / Shortgrass Steppe LTER site in Weld County, Colorado at a site where previous short-horned lizard (*Phrynosoma hernandesi*) studies have been conducted (e.g., Mathies and Martin 2008).

In the first part of our study, we explored the general efficacy of using GPR to detect the antennae of buried, unattached radio transmitters (Holohil Systems, Ltd.) positioned at known depths below the ground surface. We completed 64 GPR measurements (depth estimates) of 18 test transmitters in the blustery conditions of northern Colorado in February 2008. Post-processing of the GPR data and preliminary analyses comparing known and estimated depths will be completed in January 2009.

In the second part of the study, we tested this technique under natural field conditions using 8 radio-tagged short-horned lizards. Unfortunately, one tagged lizard was found dead above ground late in the season and we were unable to find a replacement. The remaining 7 lizards were radio-tracked to their overwintering sites following the methods of Mathies and Martin (2008).

Above ground vegetation was carefully removed from these sites to allow



Undergraduate students assist Brianne Hamm, a graduate student in geophysics from the Colorado School of Mines, in surveying a short-horned lizard hibernation site with shortwave ground-penetrating radar, northeastern Colorado. Photo was taken February 2008 by Danny Martin.

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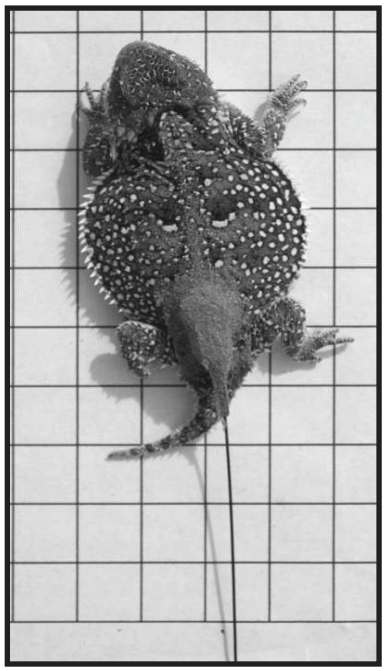
the GPR to be pulled over the overwintering sites while remaining in contact with the soil surface at all times. With the help of volunteers, we surveyed hibernation sites using GPR in February 2008. In March, we excavated sites with extreme care in an attempt to confirm depths of tagged lizards.

Digging was SLOW, but it paid off! We located all seven lizards! We then carefully backfilled each site and then monitored all sites for evidence of lizard emergence in the spring. Once many of the sites displayed evidence of emergence, we re-excavated each site to confirm emergence. The GPR measurements will be post-processed in January 2009 and estimated depths will then be compared to confirmed depths. We expect to complete analyses, synthesis, and preparation of a draft manuscript by spring 2009.

Acknowledgements
This study was made possible with funding from the Horned Lizard Conservation Society and the authors. The study was conducted on the SGS LTER, a partnership between Colorado State University (CSU), USDA ARS, and the U.S. Forest Service Pawnee National Grassland.



*Short-horned lizard (*Phrynosoma hernandesi*) with radio transmitter attached, northeastern Colorado. The grid cells are 0.5 inches on a side. Photo was taken September 2007 by Danny Martin.*

Several undergraduate student volunteers assisted with field work, including individuals from CSU Department of Biology and the Colorado School of Mines. The study was conducted under Colorado Division of Wildlife permits 07HP927A1 and 08HP942, CDOW ACUC approved file 12-2007, and USDA ARS project 228.

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Editor's note

The two articles on pages 1, 3, & 4 represent work to date from the two 2007 grant recipients, Victor Bogosian and Scott Newbold. Thank you, Victor and Scott for letting us know about your interesting work!

Please renew your annual HLCS membership!!!

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

Categories for *annual* memberships include:

Regular $25
Student or Senior $10
Family ..... $25 Each additional family member $10
Contributing $50
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The HLCS welcomes contributions in any amount you wish to submit and is a 501(c)3 nonprofit organization.

Kid's Page

Authors and Articles

The words for this word find can be found in the articles printed in this issue. The words can be forwards and backwards and are displayed horizontally, vertically, and diagonally. (*Answer on page 11*.)

ARIZONA
AUSTRALIA
BOGOSIAN
COLORADO
CONSERVATION
CORNUTUM
FRAGMENTATION
HERNANDESI
HIBERNATION
MEXICO
NEWBOLD
PHRYNOSOMA
POGONOMYRMEX
PREDATION
RADAR
SHERBROOKE
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TELEMETRY
THERMOREGULATION
THORNY DEVIL
TRANSLOCATION
TRANSMITTER

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Member Spotlight: Wade C. Sherbrooke

Wade is shown in the field with radio-telemetry equipment, pen top (not cigarette) in his mouth. Photo was taken July 22, 2007 on the King Anvil Ranch, Altar Valley, Cochise Co., Arizona by Harry Greene, Cornell University.

My first real contact with the HLCS was during the 1st Symposium in Austin, Texas, May 27, 1993. It was about then that I became a member and subsequently participated in the 2nd (San Diego; June 1, 1994), 4th (Portal; October 20-21, 2000), and 5th (Portal; June 21-23, 2002) symposia. My invitation to the 1st Symposium as keynote speaker probably was due to my 1981 publication, *Horned Lizards: Unique Reptiles of Western North America*, aimed at the general public.

More than any details about the talk, I can remember putting together an unnarrated slide show of images — Native American artifacts, modern artwork, etc., that ran before the talks. In those days horned lizard representations in art were scarce compared to today. Several of us were interviewed for National Public Radio; not a bad start for the HLCS!

I've continued my membership and have tried to serve the community as a contributing scientist, through research and publications (see pages 8 & 9). I delve into the lives of horned lizards in ways that I hope deepen our appreciation of their complexities as fellow life forms that share our planet.

Growing up on Staten Island, in New York City, I didn't play with horned lizards as a child. That's a western ritual. But reptiles became an interest when I was a high school volunteer at the local zoo (Kawata, K. 2003. *New York's Biggest Little Zoo: A History of the Staten Island Zoo*). Later, after four years of biological training at Cornell University (BS, 1963), I moved to Tucson to work on an MS degree in herpetology at the University of Arizona (1966). That's when I met some horned lizards.

Over those first few years in horned lizard country(1963-65) I was to meet *Phrynosoma solare* (regal), *P. platyrhinos* (desert), *P. mcallii* (flat-tailed), *P. douglassi* (now *hernandesi*, short-horned), *P. modestum* (round-tailed), and *P. cornutum* (Texas)—about 30 individuals, in places stretched between the Pinacate lava fields of Sonora (Mexico) up to the heights of the Santa Catalina Mountains and back down to the surrounding Sonoran Desert of southern Arizona, and north to the Arizona Strip country of the Grand Canyon region.

In spite of these early experiences, I left horned lizards (they still not being cemented into my life) as I journeyed as a Peace Corps Volunteer to the Peruvian Amazon. There I taught for two years at the Universidad Agraria de la Selva in Tingo Maria, and followed rainforest streamside lizards. After returning to the southwest, it wasn't until 1976 (while working on a desert plant, jojoba), that I stepped onto the "Horned Lizard Way" path that would dominate my subsequent years.

Looking for a return to lizard studies, I focused on a poorly studied group, difficult to encounter in the field, but of charismatic charm—*Phrynosoma*. My first and only grant, $200, was from the Arizona-Sonora Desert Museum. My ensuing enthusiasm, interests and activities led me to enter a Ph.D. program (4 years later) at the University of Arizona. This widened the diversity of my interests as I studied social behaviors, predation by grasshopper mice, catching rain for drinking, hormonal regulation of changes in skin color (for thermoregulation), the arrangement of pigment

continued on next page

(color) cells in the skin, mechanoreceptors (for touch) in the skin, defensive use of horns, and body-form/color mimicry of stones.

Subsequently, my employment as director of the American Museum of Natural History's Southwestern Research Station in the remote Chiricahua Mountains of southeastern Arizona put me at a geographical focal point of horned lizard biodiversity and into a social setting of a diverse community of visiting scientists. One of my first, and most rewarding, research collaborations has been with George Middendorf III (Howard University)—figuring out why (and which) horned lizards squirt blood from their eyes. Other fruitful collaborations continue, still engaging me at the Station today.

My interest in how horned lizards reduce the likelihood of being eaten by predators with different skills in locating, capturing, and figuring out how to eat a spiny meal (*Phrynosoma*) has led to studies in Mexico (with Fernando Mendoza Quijano and Elizabeth Beltrán-Sánchez) and back in Tucson (with Clayton J. May).

Looking at aspects of how these lizards eat venomous ants has led to blood factor studies with Justin Schmidt (Tucson), eye-tongue focus/coordination studies with Matthias Ott (Germany), and throat mucus-secretion studies with Kurt Schwenk (U. Connecticut).

In 2003 I retired from administrating the Southwestern Research Station in Portal and spent the next year with my wife and sons in Queensland, Australia. Here at James Cook University I continued my fascination with a subject I had discovered in 1976, "rain-harvesting," a form of drinking in Texas horned lizards and Australian thorny devils. (See article below.)

Now we live in Tucson with two teenagers — a busy time of life. I continue active field study of horned lizards, a never-ending pursuit, lecture on horned lizards, and read widely in science, anthropology, and philosophy.

In trying to bring horned lizards as ambassadors of nature to the public I have worked with TV film crews in recent years —Environmental Media ("The Lost World of the Flat-tailed Horned Lizard", 2005; Becker Entertainment /Discovery Channel ("One Step Beyond: Series 2, Ep. 2,"'Stayin' Alive [Horned Lizards]" 2005); Icon Films/Channel 5 (U.K.) ("Nick Baker's Weird Creatures: Blood Squirting Lizards," 2006); BBC ("Life in Cold Blood," 2008; "Life," 2009).

My summer days are often spent in horned lizard habitat thinking about how their lives unfold and how their surroundings — now and throughout the Pleistocene, and those of their ancestors before — have made them and us into who we are today— and what that means to us.

Amateur Photography

By Fannie Messec

Here I was on my long awaited trip to Australia. I had been told about the thorny devil, the Australian equivalent to the horned lizard. Wow, I thought, "Wouldn't be great to see one!" However, I did not expect to actually see one in this man-made oasis in the Australian Outback. If I got to see one, surely it would be on the walking tour of Uluru or the Olgas.

What a wonderful surprise I had as I walked with my family across the middle of this complex. There it was! My husband spotted it! How cooperative it was as it posed for us as we took pictures. If we got too close, it did a little dance. So colorful too–white, yellow, and a rust color that matched the sand it lives on.

Photos taken at the Ayers Rock Resort in Australia in October 2008 by Fannie Messec.

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Horned Lizard Research Grant 2009 Applications

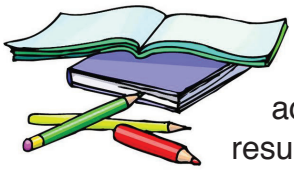
By Gad Perry

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 will be offering two $500 grants in 2009. These are intended to encourage the participation of non-academics in conservation. 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.

Two examples of grant funding in action can be found in this newsletter.

To apply, send a proposal detailing the goal of the study, the rationale for it, and how your work would benefit from this opportunity. The proposal may not exceed 1000 words, excluding up to ten references. In addition, send a resume or CV and have a single letter of reference sent to: Dr. Gad Perry, Department of Natural Resource Management, Texas Tech University, Box 42125, Lubbock, Texas 79409-2125, USA. Submission by e-mail (to Gad.Perry@TTU.edu) is greatly preferred.



The deadline is 1 March 2009. The decision will be announced by April 30.

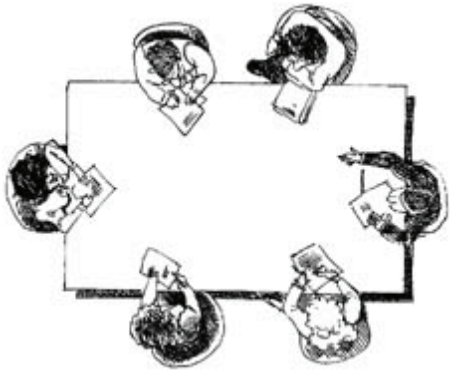
New Board Unanimously Approved

By Wendy Hodges

All ballots received by December 08, 2008, unanimously approved our slate of officers for the HLCS National Board of Directors. We'd like to thank everyone who sent in ballots and their votes of confidence.

Officers, who take their posts on January 1, 2009, include:

- President - Joyce Roach, Fort Worth, TX
- President-elect - vacant
- Secretary - Tanya Phillips, Austin, TX
- Treasurer - Rollo Newsom, Austin, TX
- Director-at-Large - Danny Martin, Fort Collins, CO
- Membership Chair (appointed position) - Lenee Weldon, Fort Worth, TX



Fannie Messec is stepping down from her position as Membership Chair (while remaining the *Phrynosomatics* Design Editor), and the Board of Directors will be appointing Lenee Weldon in her place. We thank Fannie very much for having filled this post and Lenee for taking it on!

The Board is planning to meet early in 2009 and one of their first orders of business will be appointing a President-Elect. *If you are interested in filling this Board position, please contact any of the new Board Members so you can attend the meeting.* In addition to this important task, the Board will be discussing upcoming events for 2009 including public education, field trips and an annual gathering for the membership.

Welcome to the new Board!

Guidelines on Submitting Articles and Photos

By Fannie Messec and Leslie Nossaman

If you are planning on submitting articles or photos, the editors for *Phrynosomatics* would like to recommend the following to help with our newsletter editing.

For articles:

- Header at the top of the file in Helvetica font, size 12, and Bold
- Your name "By *your name*" below the heading in Helvetica font, size 12, and not Bold
- Line space below your name and before the article text
- Use Helvetica font for text body and font size 12

- Single line spacing
- Hard paragraph ending only at the end of a paragraph with another hard paragraph ending between paragraphs
- For bulleted items, use a single tab space between the bullet and the text
- No paragraph indention
- No tabs at the beginning of paragraphs
- One-half page to two pages in length
- Word formatted document is best
- Spell-checked and grammar-checked

For photos:

- Send the highest possible resolution image possible unless the file size is too large to email
- Send the photo at least 300 DPI - for pixel dimensions = an image that is 5000 X 3000 pixels is great for many purposes, print, reproduction, etc.
- Crop to what you think is the best view of the photographed subject if you can
- If it's an original color photo, then keep it that way (for pictures or images) and we can convert it to black and white for the newsletter - we might be able to use color pictures for other purposes
- Transferring the color pictures to black and white for the newsletter sometimes takes out detail, try to use photos that have more lighting which transfer better to black and white in the newsletter

- Permission statement for HLCS use
- JPEG files are preferable
- Photo file sizes up to 1.2 MB - if more than 1.2 MB, please send a CD or DVD through the post mail.
- We need to know who took the photo, when and where it was taken, and write a description of the subject. If possible, we also like to have short stories about the photo such as why was it taken, what was going on when it was taken, and anything else the photographer would like to share about the photo.

Calling All Horned Lizard Survey Ideas!

By Lee Ann Linam

HLCS is starting our planning for the survey season now. Gives us something to do while the horned lizards are sleeping during the winter.

We've had a proposal to visit Terlingua in West Texas but this might be planned for 2010 instead. How about somewhere in Arizona or Colorado? California? Washington???

Does anyone have any friends or relatives with large ranches with horned lizards? Are there any parks, nature reserves, backyards, empty lots ... we can visit?

Any ideas can be sent to Lee Ann Linam at lalinam@txwinet.com who is currently coordinating 2009 surveys. But do it quietly, we don't want to wake the lizards.

Wordfind Answer Key

D P Y ~~L I V E D Y N R O H T~~ X R N E R
F L L M U S W N Q Y V G O R V E O G F
Q U E G X X ~~T R A N S L O C A T I O N~~
B V S N ~~C O R N U T U M~~ N M T T T P X
~~P R E D A T I O N~~ U N F E S G I A T W
N C L N M H T I U N N R N K L M L W F
P E T F M X C T M O Q A A T H S U N H
C V W M P R C A G I P G U D D N G I G
B M C B C G B V F T K M F Y A A E G X
~~A R I Z O N A~~ R A A H E P T L R R B C
H M F F D L W E U N P N C T K T O Y R
E O B E J Y D S W R H T Y T U F M R R
R I O P O L T N D E R A R O Y T R T A
N D G M D R E O F B Y T S Y Q U E E F
A M O Z A S S C G I N I I T W G H M L
N Z S L R A S E M H O O Q A C L T E R
D X I H O I E E H N S N Z L G H L L F
E A A P L L X ~~P O G O N O M Y R M E X~~
S M N K O I V V Q B M A S V R A L T Z
I X R Y C K J W B T A M K L X X J G F
~~E K O G R B R E H S Y M P O S I U M~~ E

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