

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.

The *Phrynosoma coronatum* of Table Mountain (Part II)

By Jackson Shedd

In a previous article I submitted to *Phrynosomatics* (August 2005, pg. 7), I declared that I would find the Coast Horned Lizard (*Phrynosoma coronatum*) on Table Mountain, Butte County, California and promised a follow-up submission once that event had occurred.

On the morning of May 20, 2007 I headed up to Table Mountain once again. This time I had coordinated a group survey with seven friends and we arrived in the cool morning at a location atop the expansive mesa where a horned lizard was observed by an undergraduate biology student in April, 2005. I had searched this area three or four times since that sighting (one of those times with a group) unsuccessfully.

The venture in late May this year, however, proved to be very successful! After searching for about an hour and a half, three individual males were found

at a single locality at approximately 10:30 as it began to warm up a little. At another locality two more males were found at 11:50. After that temperatures had begun to get into the low 80's and we started directing our last search efforts in the direction of where our cars were parked.



An adult in a kangaroo rat burrow.



The first three found during the survey.

At 1:00 a kangaroo rat burrow was noticed by a member of the group to have something blocking the entrance. It was a sixth horned lizard exhibiting behavior I had suggested previously in my preceding article! The lizard was sleeping in the mouth of the burrow just out of reach from sunlight, most likely digesting its morning meal of harvester ants. That burrow and some others in its immediate vicinity were the only sources of shade around, and the lizard's only means of regulating body temperature other than burying itself in

continued on page 3

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Table Mountain (Part II) — continued from page 1

the loose soil produced by the burrow's creator at the entrance.

Because the areas where horned lizards occur on Table Mountain are associated with exposed basaltic bedrock within an open grassland devoid of shrubs or other woody plants, and there is a lack of loose soil other than that produced by California Kangaroo Rats (*Dipodomys californicus*) and Botta's Pocket Gophers (*Thomomys bottae*), it seems reasonable to presume that the presence of these rodents is required in order for horned lizards to exist in this region.



Habitat on Table Mountain near exposed basaltic bedrock.

All three localities where horned lizards were observed during this survey included three components: exposed bedrock, open kangaroo rat burrows

about the edges of the bedrock, and gopher mounds within adjacently growing grasses. These rodent-made retreats appear to be very important for the survival of many species on the open, sun-exposed plateau.

I have observed Pacific Treefrog (*Pseudacris regilla*), Western Fence Lizard (*Sceloporus occidentalis*), and Western Rattlesnake (*Crotalus oreganus*) using the burrow entrances of kangaroo rats as retreats on the open plateau. Each individual burrow appears to also have its own resident wolf spider lurking at the entrance. The resting horned lizard was left unmolested in its burrow and therefore sex was undetermined.

All horned lizards were left at the exact location where they were found and I returned home that day with many photographs and lingering adrenalin; I had finally observed not one, but six, Coast Horned Lizards in my home county.

On June 3, 2007 I returned to Table Mountain with my wife

and a friend (neither of whom were present for the excitement two weeks prior) and more observations were made, including a few horned lizard feces at various, scattered localities; the shed skin from the belly of an adult horned lizard; and a juvenile female individual with a damaged occipital spine. Fecal



A juvenile female with a damaged horn.

pellets from this population are mostly comprised of harvester ants, with a small percentage of a few beetle species.

This population of Coast Horned Lizards appears to be doing very well and after the many searches in the last few years, I am very happy to know that this species is holding on within this unique community on Table Mountain!



A young adult male.

Coast Horned Lizards (*Phrynosoma coronatum*). All photos in this article were taken by Jackson Shedd in May and June 2007, Table Mountain, Butte County, California.



An adult male.

The Australian Thorny Devil

By Wade Sherbrooke

The abstract is from the cited article which just came out in *Zoomorphology*.

(Sherbrooke, W.C., A.J. Scardino, R. de Nys, and L. Schwarzkopf). 2007. Functional morphology of scale hinges used to transport water: convergent drinking adaptations in desert lizards (*Moloch horridus* and *Phrynosoma cornutum*). *Zoology* 126:89-102.



Editor supplied picture showing extent of the Thorny Devil in Australia.

Abstract:

The Australian thorny devil, *Moloch horridus* Gray, 1841, and the Texas horned lizard, *Phrynosoma cornutum* Harlan, 1825, have the remarkable ability to rapidly move water through interscalar spaces on their skin's surface to their mouth for drinking. The morphology of these scale hinges has not been

studied. We used histological and SEM techniques to examine and compare the scale hinges of both species. Additional taxa in their respective lineages were examined in order to evaluate the potential that convergent evolution has occurred. In the two species that transport water, each scale hinge has a basally expanded and semi-enclosed channel formed by the hinge joint that is interconnected with all scale hinges on the body. We hypothesize that it is within this semi-tubular channel system of hinge joints, where the b-layer keratin of the integument is very thin, that water is transported. Hinge joint walls are covered by a complex topography of fractured surfaces that greatly expand the channel's surface area and probably enhance capillary transport of water.

In addition, we note differing morphology of scale surfaces at

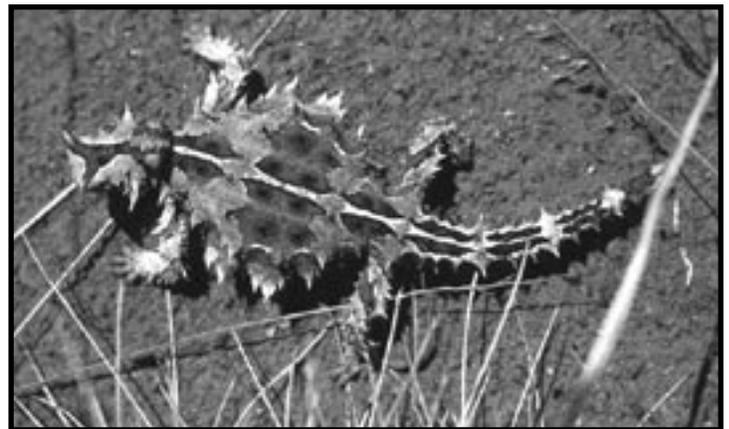


An Australian Thorny Devil Lizard (*Moloch horridus*). Photo taken by Wade Sherbrooke in Alice Springs, Australia. This lizard is drinking with jaws slightly open during a rain storm.

the rear of the jaws of both species. We hypothesize that capillary forces fill the scale-hinge system, and additional forces, generated within the mouth by observed motions during drinking, depress local water-pressure to pull water through the channels of the hinge-joint system. We conclude that the combined features in the two species, semi-tubular hinge-joint channels with convoluted walls and a jaw-buccal cavity pumping-mechanism, have convergently evolved for capture, transport, and drinking of water from sporadic rainfall.



An adult Texas Horned Lizard (*Phrynosoma douglasii*) in New Mexico. Photo taken by Wade Sherbrooke.



An adult Australian Thorny Devil Lizard (*Moloch horridus*). Photo taken by Wade Sherbrooke at Ayres Rock (Uluru), in the center of Australia.

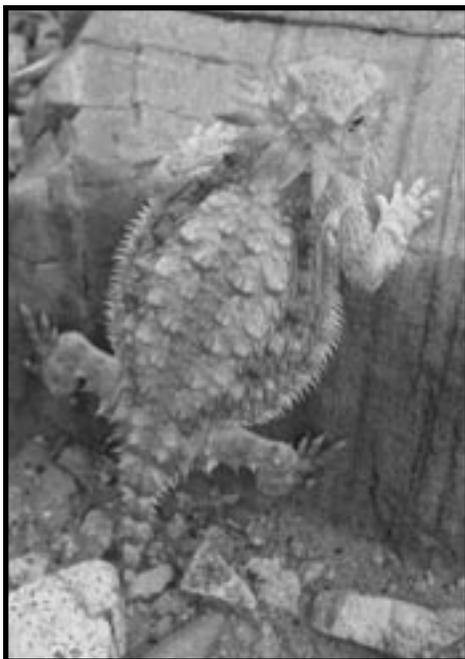
Amateur Photography



Take a good look at the Regal Horned Lizard (*Phrynosoma solare*) on the left and see if you can find it in the picture on the right. Photos taken by Roger Repp in Arizona on September 2, 2007. (Answer on page 9.)



"Discovering the Horned Lizard for the First Time." Texas Horned Lizard. Photos taken by Diana Fitzgibbon July, 2007. From Diana "...my grandkids had found a horny toad and asked me what I wanted to do. I hurried out there with my camera. The kids had found it but had not idea what it was. They ran to show their grandpa they had found an "animal". Photos taken outside Del Rio city limits in Val Verde County.



A Regal Horned Lizard (*Phrynosoma solare*). Photo taken August 23, 2007 on the trails of the Arizona-Sonora Desert Museum near Tucson, Arizona. Photo taken by Lee Ann Linam.



A Pygmy Short-horned Lizard (*Phrynosoma douglasii*). Note from Irene Arango a geologist who took the photo in Summer 2003: "I found this little guy on a hiking trail in the mountains surrounding Warner Valley (S-Central Oregon) on September 13, 2003. It stayed very relaxed in the palm of my hand while taking the photograph." Note from Wendy Hodges who provided additional information: "'Pygmy' is part of the species' officially recognized common name. It does refer to the small size of the species - adults average 2.5 inches snout to vent length. The one in the photo is probably a hatchling from last year."



HLCS Reaches Out at TPWD Wildlife Expo

By Lee Ann Linam

There are a lot of ways to measure Texas Wildlife Expo. This year's free outdoor family weekend in Austin drew over 42,000 people, including a one-day record of 26, 247 on Saturday, October 6. Of those 42,000 people, nearly 16,000 passed through the Wildlife Viewing tent, where, in my unbiased opinion, our Horned Lizard Conservation Society booth seemed to be the biggest draw! The stats say that half those visitors were kids, which is I guess why over 1,000 horned lizard masks were colored and donned. Adults took home their own horned lizard memorabilia as well, as the Society racked up nearly \$1500 in sales.

This was the 16th annual Wildlife Expo, and HLCS has done their part to share the great outdoors with the public at this venue for many years. (We're not sure if HLCS has been there each year, but Bill Brooks



Map at the TPWD Expo in Austin showing locations where people last saw a horned lizard. Photo taken by Lee Ann Linam on October 7, 2007.

counts 15 Expos under his belt, so there's probably a pretty close correlation with that statistic...). It really is a wonderful opportunity to share information about horned lizards and the conservation challenges they face with the public. This year HLCS provided four primary stations. The first was simply

an information table where the public could view some of Larry Wisdom's wonderful sculptures and learn information about horned lizards. The second was a table where participants could place a pin on a map to depict where they had last seen a horned lizard, both inside and outside Texas. We took the opportunity there to provide some education about horned lizard versus spiny lizard identification. The third was a kids' table, complete with masks, coloring pages, and stamps of horned lizards and ants, and the fourth was our merchandise table.

Expo seems to bring out the best in people. The public is always smiling as they head out the gate, weary from a day of sampling fishing, boating, shooting, climbing, camping, and



The HLCS booth at the TPWD Expo. Photo taken by Julia Osgood on October 7, 2007.



Kids coloring at TPWD Expo in Austin. Photo taken by Lee Ann Linam on October 7, 2007.



Kids coloring at TPWD Expo in Austin. Photo taken by Julia Osgood on October 7, 2007.

nature activities, but it requires a lot of work from many people. It's a logistical giant for TPWD and its employees (we have learned to never schedule any personal activities for the first week of October!), and it requires much energy from HLCS. This year our volunteer heroes included Bill Brooks, Rollo and Sylvia Newsom, Leo Reed, Helena Reed, Lisa Lanier, Amy Trost, Bill Davis, Julia Osgood, Brad Taylor, Abby and Frank Linam, and several other Texas Master Naturalists who spotted the crowds in our booth and stepped in to help! Mark your calendar for the first weekend of October next year—we can use your help, and I guarantee you'll enjoy Expo!

But, how would I measure Expo? I think it would be in the story of the lady out in the crowded Expo grounds who spotted a youngster proudly wearing his horned lizard mask who became determined to find our booth so that she could purchase a membership because she's always wanted to be



Horned lizards found at TPWD Expo. Photo taken by Julia Osgood on October 7, 2007.

able to do something to help horned lizards. Now that's effective outreach! Welcome aboard!



JOIN US and Help Protect the Texas State Reptile



HORNED LIZARD CONSERVATION SOCIETY

www.hornedlizards.org

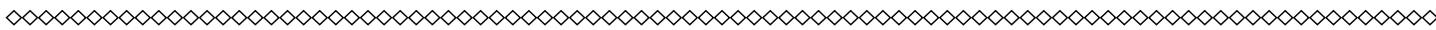
Kids' Page

By Eva Thomas

MATCH THE HORNED LIZARDS

Draw a line between the common name for the horned lizard (on the left) and the Latin name (on the right). (HINT - All lizards listed are found in the newsletter.)

- | | |
|------------------------------|-------------------------|
| 1. Pygmy short-horned Lizard | A. Phrynosoma solare |
| 2. Coast Horned Lizard | B. Phrynosoma cornutum |
| 3. Thorny Devil | C. Phrynosoma coronatum |
| 4. Texas Horned Lizard | D. Moloch horridus |
| 5. Regal Horned Lizard | E. Phrynosoma douglasii |



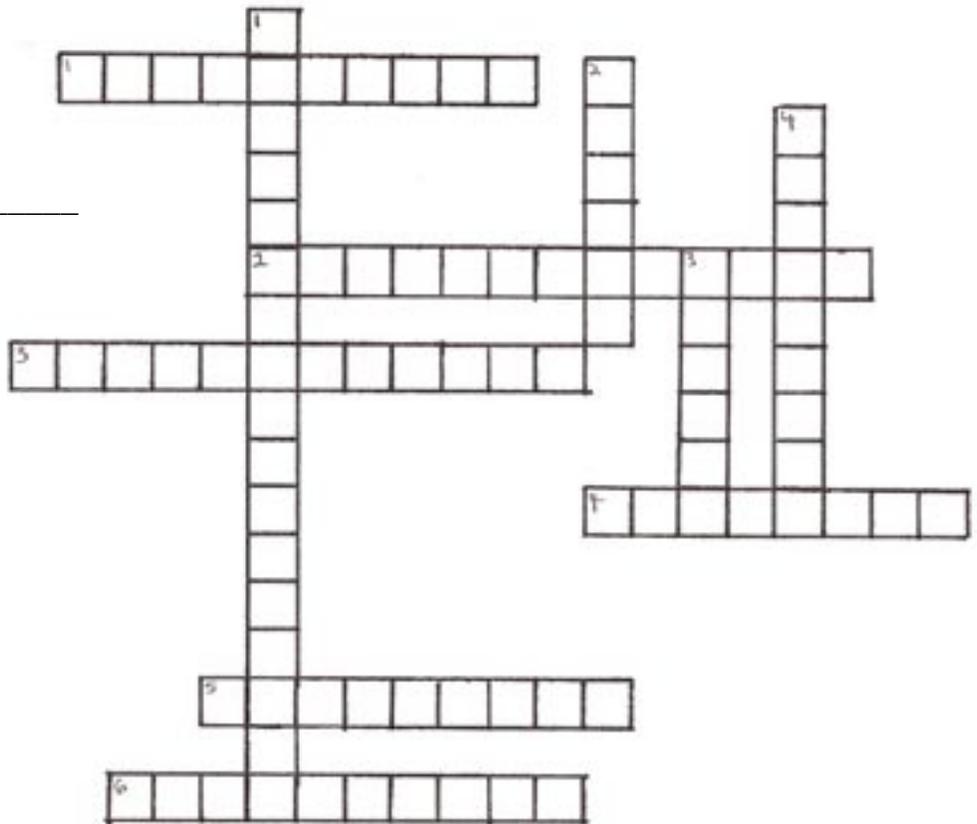
CROSSWORD PUZZLE

Across

1. HLCS President-Elect name
2. The main diet for the horned lizard
3. Horned Lizard _____ Society
4. California _____ Rats
5. One kind of force that fills the scale-hinge system for the Thorny Devil
6. A search engine that can donate to charities

Down

1. Best selling conservation car license plate for Texas
2. Botta's Pocket _____
3. City where the Texas Parks and Wildlife Expo occurs
4. Country where the Thorny Devil lives



(HINT – Except for 2 Across, all answers are found in this newsletter)

GOODSEARCH: A Search Engine that Raises Money for Us!

By Wendy Hodges

GoodSearch.com is a search engine that donates half of its revenue, about a penny per search, to charities that users designate. The HLCS has been set up as a charity through their web site. You use it just as you would any search engine, and it's powered by Yahoo!, so you get great results. Rather than Googling to find out something, use GoodSearch.

What to do:

Go to www.goodsearch.com and enter the Horned Lizard Conservation Society as the charity you want to support. You will earn us money doing a normal web search every time you use it! You can see how much money we earn at any time. Please use it as often as you can! Set it as your home page or bookmark it or put it on your web browser's tool bar. We could earn thousands of dollars a year just by having our mem-

bers designate us whenever they do an internet search.

GoodSearch has now added GoodShop. By following the links from the GoodSearch page to stores you already purchase from, a percentage will go to your charity of choice – designate HLCS! Examples of stores that donate are ebay, Barnes & Noble, Alibris books, and REI.

Thanks for contributing - and SPREAD THE WORD!!!



Where to find the lizard from page 5. The lizard's head is just to the left of the rock. The body of the lizard is behind the rock. The tail ends behind the clump of grass on the far right.

Get Involved – Serve on Your Board of Directors for 2008 - 2010!

By Wendy Hodges

It's that time again – HLCS Elections! In 2008, the torch will be passed from President Lee Ann Linam to President-elect Joyce Roach. We need to fill several National Board of Directors positions as Joyce assumes the Presidency. The positions are: President-Elect, Secretary, Treasurer, and At-large Director.



If you would like to participate in a bigger capacity or would like to nominate someone for a position, please notify Wendy Hodg-

es with full contact information. Please include the nominee's name, mailing address, phone number(s), and email address. Send the information to: Wendy Hodges, wendy@hornedlizards.org, Texas Natural Science Center, 10100 N. Burnet Road, PRC 176/R4000, Austin, TX, 78758. (For additional information about the positions, please send Wendy an email.)

HLCS National News

By Lee Ann Linam

Officer nominations - Time flies when you're having fun, so I guess that explains where the last two years went! My term as national president is winding down, so you'll notice that this edition of the newsletter contains a preliminary call for nominations for national officers for HLCS. I'd like to encourage you to consider stepping forward if you're willing to serve. I'll be truthful—like all organizations, it takes a bit of work to serve on the executive board. On the other hand, HLCS provides some of the most rewarding opportunities you'll ever have—from field trips to lovely places, to reaching kids who've never heard of horned lizards, to working with some of the most devoted, enthusiastic people you've ever met—I think you'd enjoy your service with HLCS.

By-laws changes - The list of officer positions that is being

offered this year looks a little different than in years past, which is a reflection of some ongoing discussions regarding the structure of HLCS. Those discussions are going to be presented to the membership in the form of some by-laws revisions to be voted upon in a separate mailing. Most changes have to do with simplifying the state chapter structure of HLCS. While there is interest in horned lizard conservation in many states, over time we have found that managing separate slates of officers, treasuries, etc., in each state is challenging for a small organization. The changes that will be proposed will try to both encourage and streamline activities at the state level, perhaps through the use of working groups or state councils, while focusing the administrative burden of the organization at the national level. If you have any thoughts or recommendations regarding this matter, please let me know. My door is always open!

Horned lizard funding - Finally, I just wanted to share some good news regarding horned lizard funding in Texas. Several years ago Texas began to offer a series of conservation license plates. The first plate offered, and the best-selling one to date, features a Texas horned lizard, with the intention that proceeds from the sales of the plates would go to support nongame wildlife conservation, including horned lizards. However, for several years, funds from the sales were not appropriated to Texas Parks and Wildlife Department, so they were unavailable for projects. This year the Texas Legislature once again made those funds available. TPWD is now developing the process for accepting proposals and indicates that horned lizard conservation funding could be a high priority. Let us know if you have any similar good news from your state!



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		
	Corporate	\$250		
	<i>Lifetime</i> membership	\$300		

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

Horned Lizard Items Make Great Holiday Gifts!

You can accomplish two goals while shopping this coming holiday season: buying gifts for friends and family AND give money towards horned lizard conservation. The horny toad lovers on your gift list will appreciate having an item to remind them of their cherished animal and be pleased also that the proceeds from the sale of these items help preserve this fascinating little animal.



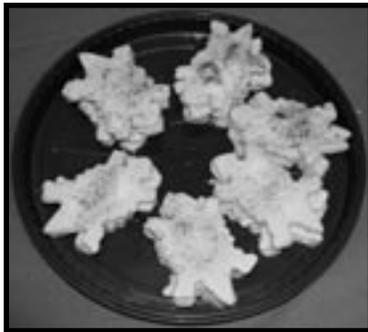
The Horned Lizard Conservation Society has over 20 items for sale? The Society has a fantastic inventory of useful and whimsical horned lizard items that are appropriate for kids of all ages.

The prices range from \$1.00 for the magnets up to \$32.50 for a limited edition print. The majority of the items are \$6 - \$12. Here is a general listing of what you can find:

- T-shirts – 5 different designs
- Pins
- Tie Tacks
- Earrings
- Necklace

- Key Ring
- Guardian Angel
- Hood Ornament
- Prints
- Blank note Cards
- Christmas Cards
- Magnet
- Bumper Sticker
- Copper horned lizard cookie cutter
- Books – 3 different titles including two for children

While these items make wonderful holiday gifts for family members or friends, the proceeds from the sale go to benefit horned lizard conservation. For complete list of items and prices see the enclosed order form.



Use the horned lizard cookie cutter to make cookies to serve Santa. Santa will appreciate your thoughtfulness as he leaves your horned lizard items.



Allison Gottschalk is wearing the official HLCS cap.



Horned lizard keychain



Figurine



Two of the five T-shirt designs



Don't forget to tell Santa which of these HLCS items you want.



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PLEASE JOIN US! Students/Seniors: \$10; Regular: \$25; Contributing: \$50; Corporate: \$250; Lifetime: \$300
Families: \$25 for the first person and \$10 for each additional member
HLCS is a 501(c)(3) non-profit organization. Contributions are deductible to the extent allowable by law.

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Table of Contents

The <i>Phrynosoma coronatum</i> of Table Mountain (Part II).....	page 1, 3
Jackson Shedd	
The Australian Thorny Devil□	page 4
Wade Sherbrooke	
Amateur Photography□	page 5
various photographers	
HLCS Reaches Out at TPWD Wildlife Expo.....	page 6-7
Lee Ann Linam	
Kids' Page.□	page 8
Eva Thomas	
GOODSEARCH: A Search Engine that Raises Money for Us!	page 9
Wendy Hodges	
Get Involved – Serve on Your Board of Directors for 2008 - 2010	page 9
Wendy Hodges	
HLCS National News.....□	page 10
Lee Ann Linam	
Horned Lizard Items Make Great Holiday Gifts!.....	page 11