



Phrynosomatics

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.

August/September 1993

The Newsletter of the Horned Lizard Conservation Society

K - 3rd Grade Horned Lizard Curriculum for Texas!

by Lee Stone

The Kindergarten through 3rd Grade Horned Lizard Curriculum for Texas is ready to be printed. It includes the following: a glossary of words for discussion, a compilation of books on horned lizards, slides and a narrative, art projects, songs, and games.

For example, there is a maze drawing with an ant and a horny toad and an original recipe for horned lizard-shaped sugar cookies. The teacher's guide includes half-tone copies of the slides.

The curriculum covers identification of the various species of horned lizards, unique physical and behavioral characteristics, misconceptions

about horny toads, range maps for Texas, and some reasons why they are declining. It is 15 - 45 minutes long, depending on the age group.

Our new curriculum meets Texas Education Agency criteria and can be used for lessons in science, Texas history, fine arts, geography, language arts, and multi-cultural studies.

Member Karl Richter has generously offered to put the already completed Kindergarten through 3rd grade curriculum slides onto a master video tape with narrative. The storybooks, slides and narratives are being prepared to be sent on to him.

We want to have 300 copies of this curriculum available for our

presentation to the Texas Conference of Science Teachers early November.

Committee Chair Carolyn Todd, Committee member and teacher Glenda Bell, and all the other regular committee members, Steve Austin, Joyce Snodgrass, and others deserve a great round of applause. This is wonderful work they are doing on behalf of horned toads and children, and both their futures. The committee under the leadership of Carolyn Todd have met a high standard of professional quality. ▲

HLCS Chair of Research and Recovery Takes Arizona Job

by Lee Stone

Wendy Donaldson, Chair of our Research and Recovery Committee has accepted a short-term position with the Arizona Fish and Game Department.

She will be surveying for horned lizards indigenous to Arizona. The position ends in December and Wendy will return to Austin at that time.

This is an exciting opportunity for her to expand her professional experiences and contacts, as well as to strengthen the Horned Lizard Society in Arizona.

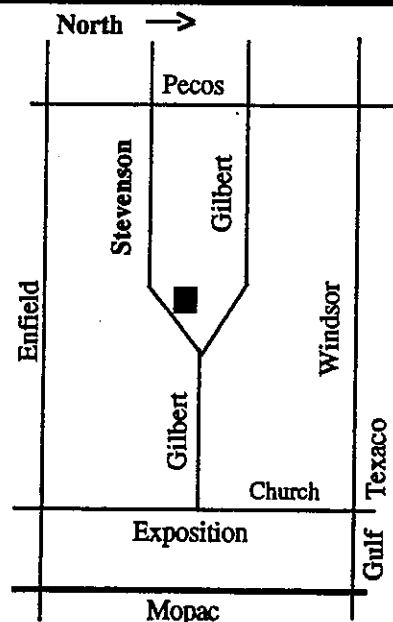
Best of luck, Wendy! We look forward to your return and the many great stories of your exploits! ▲

Upcoming Events

GENERAL MEETING
At the home of Carol and Landon Lockett
3210 Stevenson in
Austin, Texas. 512/
476-1951

Usual time: 7:00PM
on Tuesday, September 14, 1993

EDUCATION COMMITTEE
September 23, 1993 to
work on the 4-6th
Grade kits. Time and
location will be an-
nounced later. If
interested, call
Carolyn Todd at 512/
255-6770



Requirements for Long-Term Persistence of the Texas Horned Lizard

*Presented at the First Annual Conference on Horned Lizards on May 27, 1993 by E.J. Allen, Department of Mathematics at Texas Tech University.
Edited for "Phrynosomatics" by Lee Stone*

This paper examines what requirements are needed for the long-term persistence of the Texas Horned Lizard. Mathematical models for persistence-time are used to obtain estimations. Here are some facts to keep in mind.

Population size and persistence through time are random processes; and populations, whether they be animal or plant experience **random fluctuations**. These are due to fluctuations in birth and death rates and to environmental variations. In addition, populations are limited by resources, habitat size, and loss of individuals by emigration.

This persistence-over-time models used by mathematicians take into account the inherently random behavior of the birth-death process. They also incorporate environmental variations and emigration losses. And they've been tested against persistence data for mountain animals in the southwestern U. S. (E. J. Allen, et al., *J. Theor. Biol.*(1992)

Here's an example of a mathematically simulated population: with a birth rate of .5 (or 50%), and death rate of .5, and a maximum population size of 200, the mean [average] persistence time T of that population would be 338 years. Then that population would be gone.

The basic results of persistence-time models are very useful. For example, persistence-time is proportional to maximum population size, and therefore to habitat area. Persistence-time decreases rapidly as the ratio of death rate to birth rate increases. Hypothetically, if a population of 10,000 horned lizards has a birth rate of .35 and a death

rate of .385, they could only persist for 210 years.

There are several benefits and limitations of persistence-time modeling. Models help us understand how changes in population parameters can affect persistence-time. **They can also assist in assessing management strategies for long-term persistence.**

However, due to a lack of actual field data on persistence, accurate estimates of persistence-time are difficult to make for a particular species. One must also assume is that there are no irreversible or systematic changes in the environment, such as a climatic shift or the introduction of a new species.

The effectiveness of management strategies can be evaluated in terms of persistence-time.

Take, for example, the simple management strategy of removing individuals from the population when the population exceeds a maximum level (to prevent deterioration of the habitat). Or a researcher might simply notice the habitat is improved because the population has fallen below a critical level (that is, the death ratio is greater than the birth rate). If the population level is less than 10,000 individuals, and the birth rate is .28, with a death rate of .42, then the persistence of the population over time would theoretically be 62.1 years. If management techniques decreased the death rate to .335, the persistence-time would be 14,300 years.

The long-term persistence of the Texas Horned Lizard is influenced by many factors.

Here are some requirements for the long-term persistence of the Texas Horned Lizard:

1 a viable harvester ant population, which is about 60% of the Texas horned lizard diet according to E. R. Pianka and W. S. Parker [*Copeia*(1975)];
2 a large land area [persistence time is proportional to the maximum

population size, which in turn is proportional to habitat area]
3 no irreversible changes in the environment that may increase the ratio of death rate to birth rate

Unfortunately, irreversible changes in the environment may occur that could decrease the persistence time of the Texas Horned Lizard.

For example, increased agricultural expansion in semi-arid regions can reduce horned lizard habitat. There are new or improved drought-resistant plants may affect land usage in West Texas. Also, invading species, such as fire ants, can negatively affect harvester ant and horned lizard populations. And research shows that fire ants appear to be adapting to the drier climate of West Texas." Sherman Phillips, Texas Tech University(1993).

However, an appropriate management strategy can significantly increase persistence time. Recall that persistence-time can increase dramatically — if the management strategy successfully decreases the ratio of death rate to birth rate. (In earlier example, persistence time increased from 62 years to 14,300 years.)

This model shows that there are some simple strategies which therefore deserve examination:

1 relocation of individuals from a population if the population exceeds a maximum level to prevent deterioration of the habitat. The flip side of this action is noticing that when the population falls below a critical level, that the habitat is improved, which theoretically decreases the ratio of death rate to birth rate.
2 protection or rearing of young horned lizards: the death rate for juvenile horned lizards is about 70%, but it is only about 35% for adult horned lizards. (E.R... Pianka and W. S. Parker, in *Copeia*(1975), the *Journal for Herpetologists and Ichthyologists*)

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Hell and Texas

Editor's note:

This article appeared in the Williamson County Sun on May 12, 1993 in Don Scarbrough's column Passing Glance. Since I am now constantly looking for anything that has the word horny toad in it or any reference to one; I am passing this along. I hope that you enjoy it. And many thanks to the Williamson County Sun for allowing me to reprint it.

About a month ago I published in this widely read (ha!) column a fragment of the old poem, *Hell in Texas*, written about a century ago. I heard it from my father in 1923, as we drove to our future home at McAllen. Recently I tried to contact my neighbor Herman Kelly, who with his wife Dorothy, were vacationing. So, I called his office and dealt with one of Herman's secretaries, Centhia Carter. She got busy and rounded up a lot of material involving the Devel and the Texas Valley, bless her.

Hell and Texas have long been associated. Back in the 1820s and '30s, if a man from Virginia or Tennessee left home between sundown and sunup, staid citizens would wag their heads and say, "He's goin' to hell or Texas." After David Crockett was defeated for Congress, he told the Tennessee voters that they could go to hell and he would go to Texas.

General Sherman is credited with saying that if he owned hell and Texas, he would rent out Texas and live in hell. "That's right," retorted a Texas, "every man for his own country."

But far from resenting this association of their state with hell, Texans, by a process of reverse boasting which Californians cannot understand, have far more than outsiders, publicized the connection. And one of the chief means of doing this has been by singing, reciting, and printing widely a poem titled "Hell in Texas."

A version of the poem, together with some evidence of its wide circulation, was published in *Southwestern Lore*, annual publication of the Texas Folk-Lore Society for 1931. This article has brought to light the authorship of the poem. The author was not a Texan by birth. He was E.U. Cook, a lawyer, who came to Texas from Iowa in the early 1880s to manage the interests of the Keystone Land and Cattle Company, which he had helped to organize and which had acquired holdings near Pearsall. Mr. Mason Maney, who was attorney for the company for 25 years, remembers him well. Cook probably wrote the poem during the great drought and die-up of 1885-86, when it was said that every cattleman in the state went broke, some of them twice.

This was not Cook's only venture into poetry. He rewrote parts of the Bible in verse and published a volume titled *The First Mortgage*, in which appeared "Hell in Texas."

Perhaps he gave the poem also to the Pearsall News, for it has been preserved in a slipping in the scrapbook of Mrs. Ruby Saunders of that city. Thousands of copies of the poem were distributed by the Buckhorn Saloon (later the Buckhorn Curio Store) of San Antonio, and a livestock company printed it on the back of their business cards.

Versions from oral source vary considerably, and since I have not been able to find *The First Mortgage*, I am reprinting the text (kindly supplied by Mr. Maney) from Mrs. Saunders' scrapbook as the most authoritative text available.

New Publication

A new book has been written about the Eastland County Courthouse horned toad Old Rip.

Entitled *O Ye Legendary Texas Horned Frog!* by June Rayfield Welch. It sell for \$10.95. Add 8.25% sales tax and \$2.00 for postage.

Hell in Texas

The Devil in Hell we're told was chained,
And a Thousand years he there remained.
He did not complain and he did not groan,
But determined he'd mart a Hell of his own,

Where he could torment the souls of men
Without being chained in a prison pen.
So he asked the Lord if He had on hand
Anything left when He made this land.

The Lord said "Yes, I had plenty on hand
But I left in down on the Rio Grande.
The fact is 'old boy' — The stuff is so poor
You cannot use it in Hell any more."

But the Devil went down and looked at the truck,
Said even as a clean gift he was stuck,
And after examining carefully well
Pronounced it even too dry for a Hell—

So, in order to get it off his hand,
Lord promised the Devil to water the lands,
For He had some water that was of no use—
Was plumb cathartic and smelt like the deuce.

So the trade was closed, the deed was given
And the Lord went back to His home in Heaven—
And the Devil had everything he needed
To make a good Hell, and sure succeeded.

He fixed up thorns all over the trees,
And mixed the sand with millions of fleas;
Tarantulas scattered along the roads,
Put needles on cactus, horns on toads.

The rattlesnake bites and the scorpion stings,
The mosquito delights with its buzzing wings;
The sand burs prevail and so do the ants.
And those who sit down need soles on their pants.

The summer heat is a hundred and ten—
Too hot for the Devil, too hot for men;
The wild boar roams thru the black chaparral—
'Tis a Hell of a place is the Texas Hell.

Publisher is:
Yell Rose Press
Dept. Q
P.O. Box 140221
Irving Texas 75014.

The Society is mentioned and our founder Bart Cox and member Bill Davis are quoted.

The State of Texas

House of Representatives

HOUSE CONCURRENT RESOLUTION NO. 141

WHEREAS, The State of Texas traditionally has recognized certain natural life forms commonly found within the state as tangible representations of both the state's proud spirit and its vast and diverse natural heritage by proclaiming them official state symbols; and

WHEREAS, The Texas horned lizard, *Phrynosoma cornutum*, is well known and much loved by its human neighbors in the hot, arid regions where it makes its home; and

WHEREAS, Known variously as a horned toad, horny toad, and horned frog, this fascinating creature nevertheless is a true lizard, a member of the reptile suborder Lacertilia, with a lineage that has been traced back to the days of the dinosaur; and

WHEREAS, The horned lizard possesses numerous attributes that qualify it for designation as an official representative of our state; despite a spiny exterior that presents a forbidding appearance, it is at heart a docile and peaceful creature; and

WHEREAS, A skilled hunter, the horned lizard helps to diminish the population of a variety of insect pests; although it prefers a diet of ants, it also will eat grasshoppers, crickets, beetles, pill bugs, and spiders; and

WHEREAS, its protective coloration and resourcefulness enable it to escape detection by predators, but when threatened it is able to inflate its body to frighten its adversaries; and

WHEREAS, Although these characteristics distinguish the horned lizard as a fitting embodiment of our state and its heritage, it is perhaps most appropriate for designation as an official state symbol because, like many other things truly Texas, it is a threatened species; now, therefore, be it

RESOLVED, That the 73rd Legislature of the State of Texas hereby recognize the Texas horned lizard as an appropriate representative of our state; and be it further

RESOLVED, That the Texas horned lizard be officially designated the State Reptile of Texas.

Since most of our members don't get the chance to read official House documents; we thought it nice to print the resolution proclaiming the horned lizard our state reptile. Many thanks to Abraham Holland for this hard work. We understand he and his brother Noah are now working on more plans to help the horned lizard. So stay tuned.

continued from page 2

3 Improve the habitat for harvester ants - perhaps by providing desirable colony sites.

In conclusion, continuing environmental and agricultural changes can significantly reduce the persistence time of the Texas Horned Lizard in Texas.

But management strategies may be used to increase the persistence time. For example, one might improve harvester ant habitat. Or promote harvester ants as beneficial to range land. Harvester ants improve the tilth, fertility, and aeration of the soil and also are useful as scavengers and predators of insects. (G. C. Wheeler and J. N. Wheeler, *The Ants of Nevada* (1986)). Or one might raise or protect young horned lizards to reduce the population death rate. ▲

Horned Lizards are Good Luck!

by Lee Stone

The Board of Directors received an entertaining and forthcoming letter from Mr. Tim McClure, partner in the Austin advertising firm that made the Southwest Airline television commercial that was so controversial.

[Note: For those of you who didn't hear about it: the airline commercial showed someone holding a horny toad. Since the Texas Horned Lizard is on the state threatened list, this is a no-no without a state permit. The commercial has been updated.] Mr. McClure has offered to work with us for the benefit of our favorite critter. President Lee Stone called and wrote to accept his offer. We see a great need for public service ads on television across the many states that have horned lizards.

These PSAs could educate people about the threatened status of some species of horny toads, teach them about the laws, and reintroduce these gentle creatures to a new generation of children. ▲

Research and Recovery Committee Drafting Release Criteria

The Research and Recovery Committee is working on criteria for evaluating potential sites for experimental release of horned lizards.

Initial discussion focused on requirements for:

- 1 sites with a minimum of 100 acres, in stable ownership, preferably a public or non-profit entity
- 2 a one acre release enclosure near the center of the 100 acres
- 3 historical occurrence of horned lizard on the site, but no lizards currently

Videos Needed

Lester G. Milroy III is compiling a videotape library on each horned lizard species for educational purposes.

Specifications: VHS or Hi 8, up to 30 minutes long.

The following should be included:

- front and side views
- adults and young,
- information on incubation times, if known,
- hatching/ birth
- typical habitat
- status
- adult behaviors, including feeding, and
- information on your research efforts.

Send to:

Lester G. Milroy III
HLCS of Southern California,
[a newly forming chapter of HLCS]
16377 Rancherias Road
Apple Valley, CA 92307
(619) 242-3370

Thanks for your contributions.

Kool Tees

Our Favorite graphic artist Steve Austin has had his art work, a four-color "horned lizard at sunset," selected for the t-shirt design for the Austin restaurant Waterloo Ice House. Congratulations Steve!

4 absence of fire ants on the site or in the greater area, or perhaps a suitable fire ant management program already in place

5 no previous use of most kinds of pesticides

6 an arthropod survey to prove suitable food resources for horned lizards

7 follow-up monitoring of the released lizards.

Further refinement is expected over the next several weeks. LS ▲

Thinking of Forming a New Chapter

Requirements for New Chapter requirements include submitting a petition to the National Board of Directors.

The petition must identify the proposed chapter boundaries, list a proposed slate of officers, and be signed by 10 active dues paying members of the HLCS.

After the petition is granted, monthly membership reports and biannual financial reports are needed. LS ▲

Goin' to the Fair

Carol Lockett of Austin has suggested a display location for the Society at the University of Texas at Austin's Undergraduate Library. HLCS will also participate in the Texas Parks and Wildlife Department's Wildlife Expo on October 2 and 3. And at the Austin, Texas Science Fun Fair at a large Austin mall.

Those members who are willing to organize displays and booths throughout horned lizard country are urged to contact Lee Stone or Carolyn Todd. Their numbers are given on the list of board of directors. LS ▲

What's Up?

Notes from the President

Want to know what the Board of Directors talks about? Here are some samples from the August 10, 1993 Board minutes and the July meeting at the Austin Nature Center in Austin, Texas.

Board member John Smith presented a summary report on requirements which proposed new chapters must fulfill. This will be forwarded to Lester Milroy III who is establishing a Southern California Chapter of HLCS.

We viewed the video of Peter Jennings and ABC News interview of our Chair of Research and Recovery Wendy Donaldson and Texas Parks and Wildlife Department's Dr. Andrew Price.

Education Committee Chair Carolyn Todd read a letter from Dr. Wade Sherbrooke — featured speaker at our First Annual Horned Lizard Conference in Austin, Texas, and director of the American Museum of Natural History's Southwestern Field Station. He has generously offered to make some of

his fantastic slides available for our school curricula projects. We then reviewed the raw video tape of Wade's presentation to select the slides we'd like to use.

We had news of a Dallas person with an illegally taken horned lizard to turn over to the Society. Wendy will contact him.

The board discussed various requests from Sandra Holland of Pleasanton, Texas, whose son initiated the naming of the Texas Horned Lizard as the State of Texas Official Reptile.

By the way, those of you in other states may want to pursue such a designation from your legislature, for the horned lizard most common in your state. Here's a helpful hint: let a child show them the way.

Our favorite graphic artist Steve Austin has had his art work, a 4-color "horned lizard at sunset" selected for the t-shirt design for the Austin restaurant Waterloo ice House. So go have a burger and pick up a t-shirt on the way out.

President

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PLEASE JOIN US NOW! | Students: \$10, Subscribing: \$10 (newsletter only), Regular: \$25, Contributing: \$50.

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