

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.

Some Observations on Surveying Horned Lizards in Dickens County, Texas from 1997 to 2017

By Edward Allen, Linda Allen, and Anna Van Fleet

1. SITE INFORMATION, SURVEY RESULTS, AND OBSERVATIONS

For 21 years, from 1997 to 2017, the authors participated in the Texas Horned Lizard Watch Program started in 1997 by the Texas Parks and Wildlife Department. (See, e.g., [5].) The authors' survey area consists of County Road 2565 in Dickens County, a paved road about four miles long. The nearest town is Spur, Texas which is about six miles southeast of CR 2565. The land along the road is about 50% mixed grass/mesquite and 50% agriculture. The soil is loamy and sandy. Red imported fire ants have not been seen in the area. Traffic along the road has generally been light from 1997 to 2017. The population of Dickens County has changed little over the survey period. The 2000 census of Dickens County gives a total popula-

tion of 2762 while by the census of 2010 the total population decreased to 2444 [1]. As Dickens County has an area of about 900 square miles, there is about 3 people per square mile although most of the people live in the towns of Spur and Dickens.

Each survey was performed by driving slowly, generally from the west end of the road to the east end, which took about 15 minutes. The horned lizards sighted on the road were counted during this time. As Texas horned lizard droppings (scat) were difficult to see from the vehicle, scat sightings were not recorded. Surveys were conducted from 4 to 13 times each year. Most of the surveys were conducted in the morning from about 9:30AM to 11:30AM CT to correspond with lizards sunning on the road.

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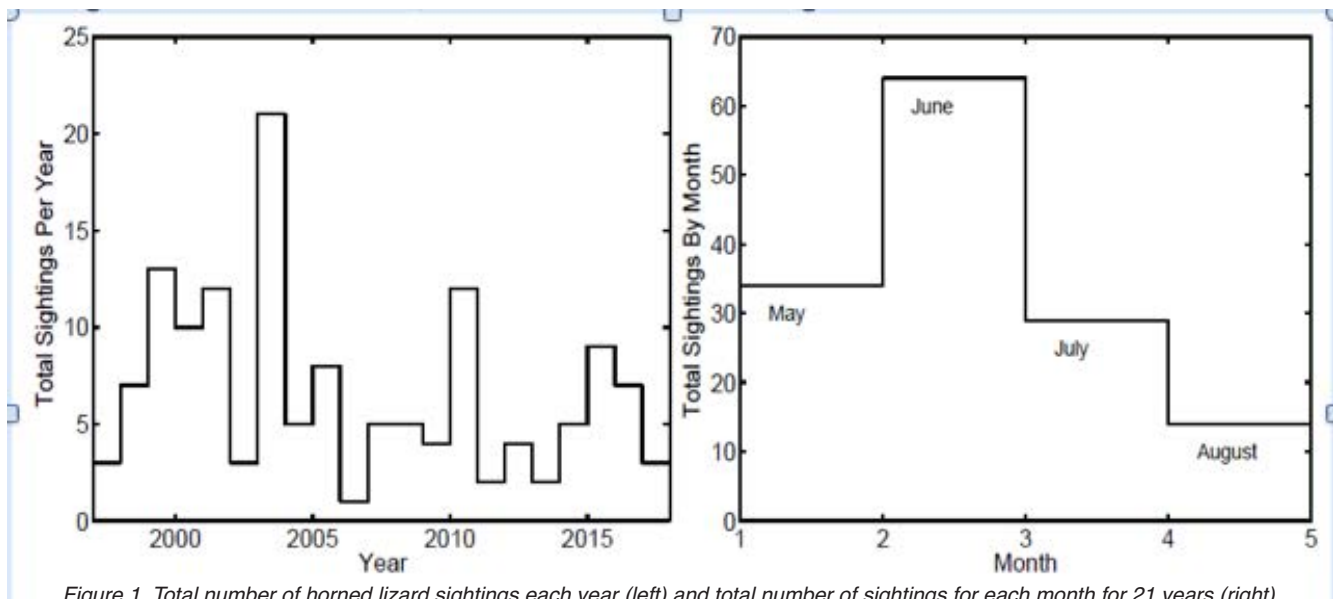


Figure 1. Total number of horned lizard sightings each year (left) and total number of sightings for each month for 21 years (right).

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Except for the four months May, June, July, and August, very few horned lizards were seen. Therefore, almost all of the survey days were restricted to these four months. For these four months, a total of 141 Texas horned lizards were sighted over the 21 year period. Of these, 64 were sighted in June which accounts for 45% of the total. Graphs of the total number of horned lizards sighted each year and the number sighted each month are given in Figure 1.

From the graphs in Figure 1, it appears that sightings of horned lizards on CR 2565 are decreasing. In particular, there appears to be a change in the number of sightings beginning about 2011. Indeed, from 1997-2010, the total number of horned lizards sighted per year was 7.8 while from 2011 to 2017 the total number sighted per year was 4.6. To see this more clearly, as June was the month of greatest frequency of horned lizard sightings, the results for the month of June are analyzed in greater detail. For the month of June, the two periods of 1999-2010 and 2011-2017 are carefully compared. The aver-

age number of horned lizards sighted per survey day in June was 1.65 for 1999-2010. This value declined to 0.62 for 2011-2017. (This difference is statistically significant at the 0.02 level by Welch's t-test [6].) In addition, the fraction of survey days in June, for which at least one horned lizard was sighted, decreased from an average of 0.79 in 1999-2010 to an average of 0.44 in 2011-2017. This is shown in Figure 2 which displays the fraction of survey days in June where at least one lizard was sighted. Also displayed is the average number of horned lizards sighted on survey days in June from 1999 to 2017.

The decline in horned lizards at the survey site may be due to the weather or to changes in habitat. In 2011, there was a severe drought with total rainfall of 6.2 inches, whereas the average yearly rainfall in Spur is 21.4 inches. Since 2003, the yearly rainfall has ranged from 6.2 inches to 40.1 inches [4]. A table of yearly rainfall for Spur is given in Table 1 [4]. For Dickens County, plant and animal populations are dependent on the timing and the amount of rainfall. For ex-

ample, populations of wild flowers, butterflies, grasshoppers, rodents, wild pigs, quail, and roadrunners strongly depend on weather, especially, rainfall. Undoubtedly, horned lizards are also influenced by the weather, perhaps indirectly through vegetation growth as well as harvester ant and roadrunner populations.

Another factor that may help explain the apparent change in horned lizard sightings on CR 2565 between the intervals 1997-2010 and 2011-2017 is the change in the mowing schedule by the Texas Department of Transportation (TxDOT). In 2010, TxDOT made changes in its mowing schedule along Texas highways, decreasing the frequency of mowing to reduce expenses. Instead of mowing when roadside vegetation appears long or overgrown, the mowing frequency was reduced to twice per year [3]. This change significantly affected the appearance of the roadside of CR 2565. Before 2010, the grass and weeds were kept fairly short throughout the year along CR 2565.

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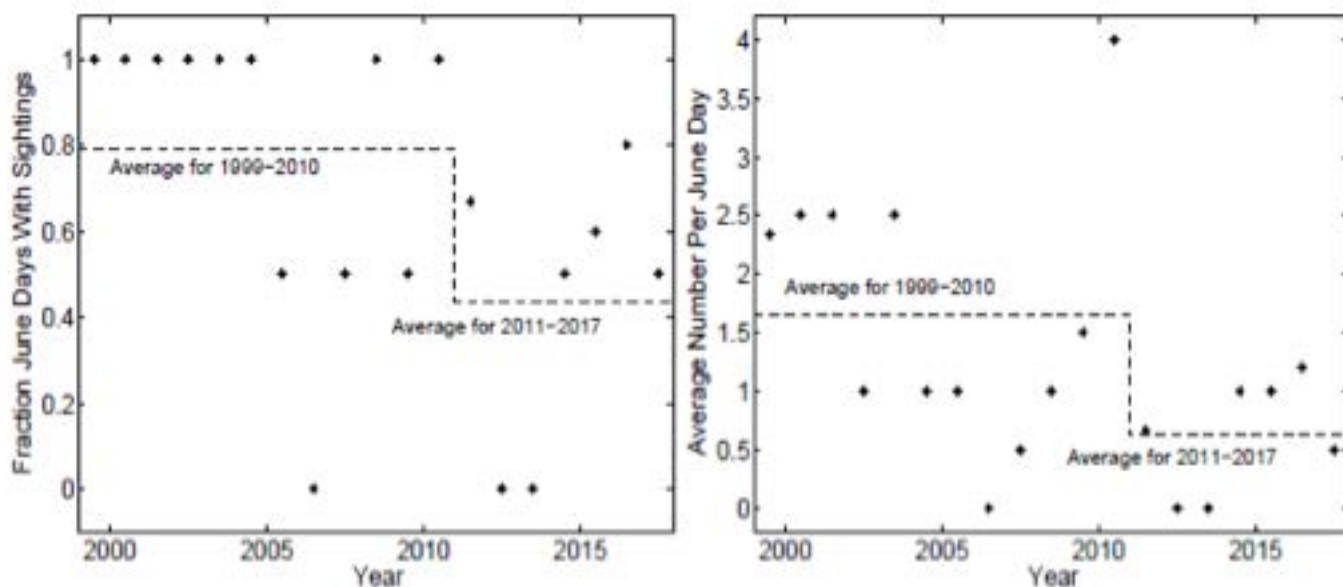


Figure 2. Fraction of survey days in June of each year from 1999 to 2017, for which at least one horned lizard was sighted (left) and average number of horned lizards sighted per day in June (right).

Harvester ant nests were abundant and easily spotted along the road. (The diet of Texas Horned Lizards consists of over 65% harvester ants [2].) After 2010, for much of the survey months, walls of vegetation of heights from one to four feet line both sides of CR 2565. It is now difficult to spot harvester ant nests. It is clear that the populations of harvester ants have been significantly impacted, which in turn has affected horned lizard populations as well.

2. SUMMARY

In summary, our data indicates a decline in the Texas Horned Lizard population density along CR 2565 in Dickens County after 2010. However, the decrease in sighting frequency may be due to changes in the habitat of the survey site. The change in mowing frequency of TxDOT along the roadside may be partly responsible for the sighting decrease. In addition, the horned lizard population experiences swings in population levels from year to year. These variations may

be due to changes in the timing and amount of rainfall which affect the prey and predators of the Texas Horned Lizard.

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Year	Total Rainfall (inches)	Year	Total Rainfall (inches)
2003	12.9	2010	27.7
2004	40.1	2011	6.2
2005	19.6	2012	14.7
2006	22.7	2013	14.9
2007	28.5	2104	18.8
2008	26.6	2015	29.0
2009	17.2	2016	20.3

Table 1. Total Annual Rainfall in Spur, Texas From 2003 to 2016. (Data from West Texas Mesonet)



Horned Lizard Research Grant 2019 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 2019. 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. 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 Monty Criswell: mcrisw1@gmail.com. The deadline is January 1, 2019. The decision will be announced by January 31, 2019.

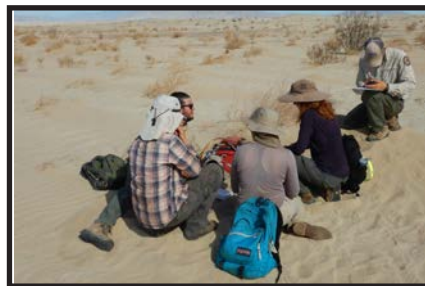


Calling All Horned Lizard Survey Ideas!

By Leslie Nossaman

In terms of promoting the HLCS mission and providing research and educational opportunities in the field, HLCS volunteers conduct surveys on private property, state parks, wildlife management areas, and state and national refuges periodically when requested and scheduled. Surveys are only open to current members and no one under the age of 12 is allowed for safety reasons.

Surveys are important to track the horned lizard numbers and their health. In the past we have done surveys with other organizations such as Texas Parks and Wildlife, Dallas Zoo, and the Wildlife Biological Diversity Team.



Some of the past surveys have been located at the boundary of the horned lizard habitat in central and some east Texas in an effort to find any evidence they may still exist and to locate areas where there might be good reintroduction opportunities.

We're currently looking for horned lizard survey ideas for 2018. Please send ideas to HLCS, President Jared Fuller (jaredansley@gmail.com).



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Eastland's Old Rip Festival

By Bill Brooks

Friday night October 6th, Bette & Jim Armstrong and I met at our booth spot on the road next to the Eastland county courthouse. As we usually do, we set up our HLCS pop-up shelter and tables. This saves us a little time on set-up for tomorrow's Old Rip Festival.


Every member of the HLCS should attend this small town festival at least once in their life. This fest is dedicated to the memory of Old Rip, the most famous horned toad in the world (as proclaimed by the Texas legislature.) This Rip Van

Winkle toad was shut away in the courthouse cornerstone for 31 years. It is said that after his un-entombment he visited President Calvin Coolidge. Not long after, the toad nicknamed "Old Rip" caught a cold and died, but fear not! You can still see the dried body of this luminary. He is resting in a coffin which can be viewed through a window in Eastland's courthouse.

Saturday morning we laid out our sales goods, handouts, and displays and readied for the endless crowds. Bette, Jim, and I were joined by our new membership chair Lynn Seman.

What a delightful lady and a fellow Texas Master Naturalist. We hit it off immediately.

As the sun began to set, we ended another wonderful day at the Old Rip Festival. We stuffed my van with our booth supplies and then went off to eat Chinese food and have a few margaritas. This was a great way to end the largest HLCS outreach event of the year.

Perhaps you may want to join us next year. The Old Rip Festival is always held in Eastland, TX the first Saturday in October. Put it on your calendar now. See you on the road. 



Jim Armstrong wearing one of Bette's HL puppet hats at the HLCS Eastland Old Rip Festival booth.



Kids at the Old Rip Festival. The HLCS masks are a hit everywhere we go

Upcoming Grant Award Announcement

By Leslie Nossaman

The Horned Lizard Conservation Society grant committee is currently reviewing the candidates for our grant awards for 2018. We are very excited that we have received so many ap-

plications this year. Supporting horned lizard research and education is the most important task for the Horned Lizard Conservation Society.

Look for the final results in the May 2018 *Phrynosomatics*

newsletter issue which will include a summary of their proposal and on the HLCS website starting in February.



HLCS Volunteer Appreciation

By Leslie Nossaman

There are lots of people who assist in volunteer efforts for the HLCS who are mostly behind the scenes that we would like to acknowledge.

Newsletter Print and Mailing

Manager – Taylor Dee (Biologist with ECORP Consulting, Inc.)

Horned Lizard Die-Cut Machine and making horned lizard bookmarks – Fannie Messec

Sales Merchandise – Bill Brooks

Webmaster – Tanya Phillips

Post mail coordinator - Amy Trost

Thank you, volunteers. It takes time to do these roles and responsibilities and we appreciate you!



Support Horned Lizard Conservation by Purchasing Texas Horned Lizards License Plates

By Leslie Nossaman

The horned lizard vehicle license plate, the first of the Texas Parks and Wildlife Department's conservation license plates was introduced in 1999. The horned lizard plate quickly became one of most popular specialty license plates in Texas. In 2006, it was the #3 best selling specialty plate in Texas. There are now eight conservation license plates offered through Texas Parks and Wildlife.

The Horned Lizard license plate is part of the Wild for Texas Collection. There is also a category for State Parks, Texas Rivers, and Hunting and Fishing.

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 eight 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.



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www.hornedlizards.org

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Phrynosomatics is now sent electronically.