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 19, Issue No. 4 **NOVEMBER 2014**

A Trip to Encounter the Short-horned Lizard *Phrynosoma braconneiri* in Oaxaca, Mexico

by Ríos, Hernández, Santillán, Hildalgo, Aparicio, and Sherbrooke

Departing from Mexico City in the middle of October, 2012, we began our last expedition of the year to study Mexican horned lizards in the field. We would travel south to the state of Oaxaca to further investigate the little known and mythic short-horned horned lizard, *Phrynosoma braconnieri*. Its restricted distribution is limited to the states of Oaxaca and Puebla.

Short-horned lizard with color-and-pattern camouflage. Photo by Wade Sherbrooke.

The team consisted of Alfonso, whose interest in horned lizards since childhood has lead to his current master's degree research (our major focus) at Universidad Nacional Autónoma de México (UNAM), Esmeralda (biology graduate at UNAM, in marine studies; but also fascinated by horned lizards and their blood-squirting defense), Jong-Yeol Moon (an ornithology graduate student, Seoul National University; who had meet Wade and Alfonso earlier in the year in South Korea and at the Southwestern Research Station [SWRS], respectively), and Wade (who had earlier in the spring spent *Phrynosoma*-time in Guerrero and Puebla, México, with Alfonso and others). Following that trip Alfonso had visited Tucson and the SWRS in Portal, Arizona, to work on thermoregulation in *Phrynosoma solare, P. cornutum*, and *P. modestum*. Alfonso's friendship with Jong-Yeol developed at the SWRS and resulted in Jong-Yeol's interest in joining us in Mexico. The linguistic limitations of mixing three languages, Korean, Spanish, and English, sometimes resulted in our use of universal gestures to communicate, but always it was lots of fun.

The six-hour drive in the UNAM pickup truck to Oaxaca City ended with a late-lunch visit to the city's central market for delicious regional foods, including pollo con mole, chicken with a sauce made from several types of chili, various seeds, and chocolate, and horchata, a drink made from ground rice in water, flavored with cinnamon,

Continued on page 3

National Board of Directors

***on the web at* — www.hornedlizards.org**

Colorado Contact

Texas Contact

Nevada Contact

Mexico Contact

New Mexico Contact

Phrynosomatics Copy Editor

California Contact

Phrynosomatics Design Editor

Please Send Membership Applications or Requests for Information to:

HLCS
P.O. Box 122
Austin, TX 78767

info@hornedlizards.org

milk, and sugar. Other great market, restaurant, and home-prepared meals would follow.

From here we departed north for two hours of driving into the mountains to our destination, the Universidad de la Sierra Juárez. Here we meet other project collaborators, Victor and his student Miriam, both of whom had also been involved with Alfonso's earlier work here. They settled the out-of-town folks in university accommodations, an apartment, which would serve as a base of research activities during the following 10 days. Before beginning looking for horned lizards Alfonso attended to contacting the local authorities about our planned activities to again get their permission to enter the areas. Fortunately the local people are very protective of their region, careful of who enters and leaves and of what they are doing; happily this enhances local conservation and security.

The dominant vegetation of this mountainous zone is oak and pine forest, with nearby high-rainfall cloud forests where rains fall one in every three days of the year (Fig. 1). Daily, day-night temperatures often fluctuate as much as 30° C, but when clouds cover the landscape and rains fall the temperature may not reach 15° C. These differences in climatic factors greatly affect ones chances of encountering horned lizards (camaleones).

Alfonso's previous work in the area enhanced our chances as populations of *Phrynosoma braconnieri* had been located and aspects of their thermal ecology were studied. But now we returned with radio-telemetry equipment, transmitters to fit on lizards and antennas and receivers to relocate released short-tailed horned lizards. Our goals were (1) to expand and complement earlier work on thermal ecology of the species, and (2), with the help and knowledge of the local indigenous people, initiate a study of their beliefs about camaleones, an ethnobiological study in which we were guided by Tania. But there was no assurance of finding short-tailed horned lizards as they use their color-and-pattern camouflage to escape notice and remain motionless until nearly stepped on (Fig. 2). This cryptic horned lizard species has been known in Mexico for well over a century, but to date is known only from about 20 locations – lots fewer than many other species.

Our first impression on arriving at our known location for these lizards was shock. Many small trees and shrubs had recently been cut down by locals in an attempt to reduce the presence of noxious or harmful animals, like snakes. Nevertheless, on the first day we found several horned lizards and we subsequently found a good number (Fig. 3). Searching we became aware of their persistence among the dead branches and foliage lying on the soil. Once seen and captured the next steps involved attaching the radio-transmitter to the lizard's back, releasing each at the spot where it was encountered (Fig. 4), and later returning to the site

Continued on page 4

Fig. 1. Landscape of the Sierra Juárez, Oaxaca, México, where Phrynosoma braconnieri *(short-tailed horned lizard) was studied in 2012.*

Fig. 2. A cryptic short-tailed horned lizard is seen.

Fig. 3. A large female short-tailed horned lizard.

to relocate it (Fig. 5). During the study we were able to follow three males and three females.

On subsequent days all these lizards were relocated twice daily at selected times, when body and ambient temperatures were taken (Fig 6). These data give us an idea of the temperatures needed by short-tailed horned lizards in this population to maintain activity. Also we were able to observe the sites where and when they found nocturnal refuge, ceasing activity, and note conditions when activity was subsequently resumed.

When not in the field with the lizards we were able to focus on our other horned lizard project. Our ethno-biologist, Tania, had prepared a questionnaire for our use with residence of the Sierra Norte. Victor was instrumental in enlisting his

Fig. 5. Alfonso Hernández Ríos uses radio-telemetry receiver and antenna to relocate each short-tailed horned lizard.

Fig. 4. The signal from the radio-transmitter leads us back to every lizard no matter time-of-day or night, obscuring vegetation, or weather conditions.

enthusiastic university students who visited with dozens of locals to record their beliefs about camaleones. We also visited another Sierra town, and later one in the central valleys (see below), to expand our coverage.

One of the most popular beliefs we found was that when a person has a headache or is suf-

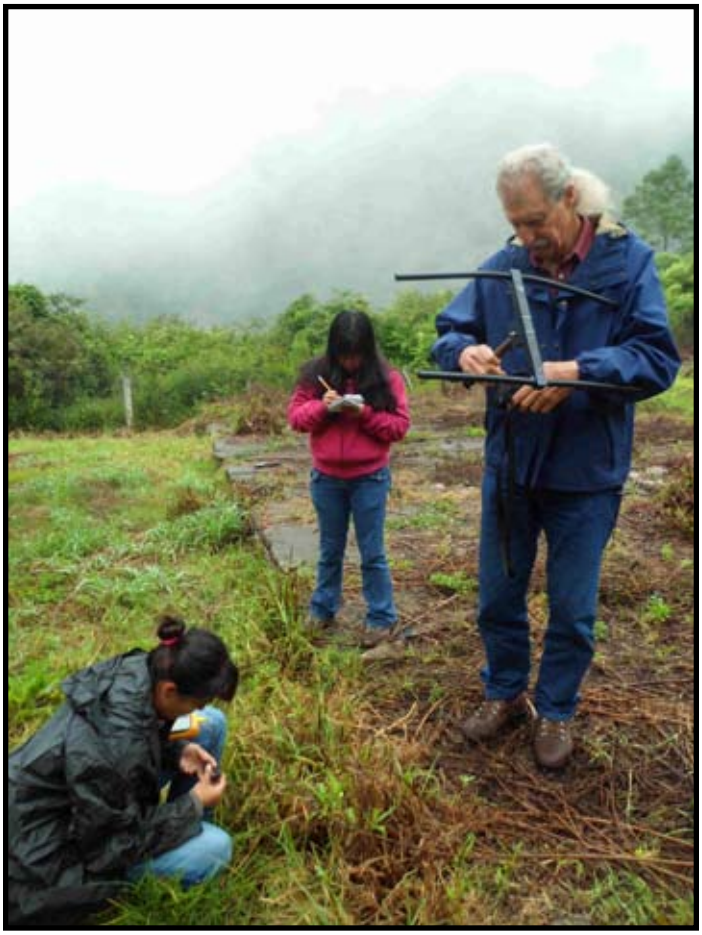

Fig. 6. Once a lizard is located data are recorded. (Left to right, Esmeralda Bravo Hernández, Miriam Illescas Aparicio, and Wade C. Sherbrooke.)

Fig. 7. Alfonso Hernández Ríos interviews a local resident concerning her beliefs about short-horned horned lizards.

Fig. 8. A university student tried the cure for mal aire or mal del ojo. The lizard inflates.

fering bad feelings that are the result of "el aire" (bad air) or "el mal de ojo" (evil eye) it can be treated with a horned lizard (Fig 7). These sicknesses are caused by negative energy directed at the recipient by other people. The treatment consists of placing a horned lizard on the head of the "patient," like putting on a hat, and as it inflates its body the lizard has the ability to suck-out or take-away the bad air or evil from the person's head thus effecting a cure. Usually a hat is placed over the lizard during the head-top treatment. The time needed to have the horned lizard on the person's head varies depending on the intensity of the headache, or the type of bad air or evil causing the sickness. Generally, one places the horned lizard on the head for two to five minutes, but only for a minute if the lizard is stressed. This can be repeated and even continued until the patient feels better and the bad air or evil has been removed (Fig. 8). This sickness is considered to be of cultural origin as no evidence of physiological basis has been identified and it is a common belief among indigenous and mestizo (mixed Native American and European) peoples of Mexico. The apparent origin of the belief is derived from horned lizards' defensive behavior of inflating their body, visually increasing apparent size and spiny defenses, when threatened by some predators.

Another species in the state of Hidalgo, *Phrynosoma orbiculare*, is viewed in a similar fashion (Gutiérrez-Santillán 2010). Here the Nahua people believe that this horned lizard can remove bad air or evil from a person when it inflates or even when it squirts blood from the eyes. Therefore these people protect them as part of the environment so that they may thrive and thus are able to cure more people over time. The result is a cultural effort at conservation of the species.

On the other hand local opinions in Oaxaca may differ concerning horned lizards, being mixed either good or bad. Some people believe they are venomous and dangerous, but others do not share this belief. This mixed cultural view is the case with other species of horned lizards as well, such as *Phrynosoma orbiculare*. For example, some groups of Nahua speakers in Hidalgo believe *P. orbiculare* plays a duel role at a cultural level. They can be seen as bad or good, but generally are considered to be good omens and helpful. They are said to be "amigos del hombre" (friend of man) and the one that "cuida a los niños" (takes care of children). This all leads to a conclusion that since ancient times in Mexico lizards of the genus *Phrynosoma* have had a strong relationship with humans and have played an important role in the cultures of indigenous Mexico (Gutiérrez-Santillán and Sherbrooke 2014).

At the end of ten days we prepared to leave, removing radio-transmitters from the lizards. The females appeared gravid (this species gives live birth), with higher weights than at other times of the year. We decided to try to confirm the presence inside the females of developing embryos by using ultrasonic gynecological equipment to detect heart-beats of embryos with the aid of two local doctors, but our efforts failed. (This tech-

Continued on page 6

Fig. 9. Two horned lizard alebrijes from San Martín Tilcajete, Oaxaca, México. (collection of Wade C. Sherbrooke)

nique was invented and explored by our friend Marcos Garcia Pareja in Guerrero with Phrynosoma asio; Garcia-Pareja 2012). Transporting females back to Mexico City subsequently resulted in the birth of two groups of young, confirming our suspicions and providing new reproductive data.

Departing the Sierra, and leaving behind our friends Victor and Miriam, we proceeded south for a stop in San Martín Tilcajete, where many of the artistic residents make their living constructing brightly-colored real or fantasy animals from wood that are called “alebrijes” (Fig. 9). These unique items are sold around the world. Many of these indigenous people were acquainted with camaleones and offered responses to our questionnaires (Fig. 10). Some seemed to believe horned lizards to be venomous, perhaps due (suggested one family) to having eaten coral snakes. This is difficult for us to understand, but perhaps is worth further ethnobiological investigation?

Then returning to central Mexico we visited with Tania in Pachuca, Hidalgo, to share our delightful memories and ethnographic surveys. All of us are looking forward to other great adventures with Mexico’s wonderful diversity of horned lizards.

Acknowledgements: We thank Jong Yeol Moon and the students of Victor Aguirre Hidalgo Ríos at the Universidad de la Sierra Juárez for field and survey assistance. Dr. Fausto Roberto Méndez de la Cruz (UNAM), the Universidad Nacional Autónoma de México, and the Universidad de la Sierra Juárez provided logistical support. The Comisariado Ejidal de Ixtlán de Juárez granted permission of access and study. Alfonso Hernández-Ríos received support from the Consejo Nacional de Ciencia y Tecnología and the Consejo Mexiquense de Ciencia y Tecnología.

Fig. 10. Esmeralda Bravo Hernández records information from the ethnobiology survey in San Martín Tilcajete, Oaxaca, México. Note HLCS hat.

Literature Cited:

García-Pareja, M. 2012. Biología reproductora de Phrynosoma asio (Phrynosomatidae) en el cerro Tepetlayo, Zumpango de Neri, Municipio de Eduardo Neri. Bachelor Thesis. Universidad Autónoma de Guerrero. Chilpancingo, Guerrero, México. 46 p.

Gutiérrez-Santillán, T.V., A. Moreno-Fuentes, and I.G. Mayer-Goyeneches. 2010. Cosmos, corpus y praxis: estudio comparativo entre Nahuas y Otomíes del estado de Hidalgo, México: El caso del “camaleón.” Pp. 81-94, In, Sistemas Biocognitivos Tradicionales: Paradigmas en la Conservación Biológica y el Fortalecimiento Cultural, Edited by A. Morenos Fuentes, M. T. Pulido Silva, R. Mariaca Méndez, R. Valadez Azùa, P. Mejia Correa, and T. V. Gutiérrez Santillán. pp. 486.

Gutiérrez-Santillán, T.V. and W.C. Sherbrooke. 2014. Visiting the Mexican Plateau Horned Lizard (Phrynosoma orbiculare) at El Parque Ecoturistico “El Camaleón,” Hidalgo, México: with Historical and Ethnobiological Commentary. Phrynosomatics 19(1):4-9.

(Photographs by Alfonso Hernández Ríos and

Esmeralda Bravo Hernández, and Fig. 10 by Skylar W. Sherbrooke)

Authors:
Alfonso Hernández Ríos, Biól. Laboratorio de Herpetología, Instituto de Biología, Universidad Nacional Autónoma de México, DF, México.

Esmeralda Bravo Hernández, Biól. Instituto de Biología, Universidad Nacional Autónoma de México, DF, México.

Tania Vianney Gutiérrez Santillán, M.S., Centro de Investigaciones Biológicas, Universidad Autónoma de Hidalgo, Pachuca, México.

Victor Aguirre Hidalgo, Ph.D., Laboratorio de Ecología y Biodiversidad, Universidad de la Sierra Juárez, Oaxaca, México.

Miriam Illescas Aparicio, Biól. Laboratorio de Ecología y Biodiversidad, Universidad de la Sierra Juárez, Oaxaca, México.

Wade C. Sherbrooke, Ph.D., Southwestern Research Station, American Museum of Natural History, Portal, Arizona, USA.

Horned Lizard Research Grant 2015 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 two $800- grants in 2015. One grant will be awarded for research and another grant will be awarded for 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 Megan Lahti: megan.lahti@gmail.com. The deadline is January 1, 2015. The decision will be announced by January 31, 2015.

The Old Rip Festival 2014

By Bill Brooks

One more year, one more fantastic time. Jim and Bette Armstrong and I had a delightful day in the shadow of the Eastland county court house, the final resting place of Old Rip.

The HLCS has had a booth at this small town festival for so many years that we have developed friendships with a great number of people. Thanks once again go out to Bill Brock who has reserved and paid for our booth for many years.

If you don't know Old Rip, the most famous horned lizard in the world who visited the president of the U.S.—you should. It's a great story. Check it out.

Leslie Nossaman, Fannie Messec, Lucy Coward, and Celia Escamilla and others all do outreach for the society. If you would like to have a HLCS booth at your local nature festival, please let us know. We will supply you with handouts and support if possible.

Member Highlight—Megan Lahti

By Megan Lahti

When I mention to my students that I am a herpetologist, they always ask why I chose this field. While I have many answers for this, I will share with you my first reason, which is that reptiles and amphibians chose me. I took about a week to author my first book while I was in kindergarten (in between recess, reading, and nap time): *Mother May I Keep Him?* I eagerly scribbled words with my atrocious penmanship, and filled in my sketches with crayons with the perfection of a 5 year old. I am admittedly still proud of my first book, mostly because it's my only book. I was elated to read my book to the class, and tell what in retrospect is a fairly dark-humored story for my then age. In the story, a girl (myself) finds a snake while playing in the yard and ecstatically carries it inside to her mother in the kitchen. As my mother turns around to look, I shove the snake into her hands, hoping for her to share my excitement. The snake sheds its skin, my mother screams, and I ask with sincere hope, "mother may I keep him?"

The end of this story, it turns out, was just the beginning for my career as a herpetologist, and the dismay of my parents. Fortunately for my parents (as much fortune they are spared from my childhood), my interests shifted towards lizards. I was a freshman in high school when I realized I could make a living chasing lizards—and so began my path to becoming a Ph.D., or as my students like to say, "a lizard doctor." Now, as a Professor of Biology at Northern Arizona University – Yuma and an adjunct professor at Arizona Western College (Yuma, AZ), I have the opportunity to educate others about my passions through teaching courses in biology and environmental science.

My passion is to study the ecology and conservation of horned lizards. My interests include investigating thermal tolerance and body size evolution of lizards in cooler climates, such as the pygmy short horned lizard (*Phrynosoma douglasii*) in the Pacific Northwest and dwarfed populations of the short horned lizard (*P. hernandesi*) in the San Luis Valley, Colorado.

I have experienced such amazing opportunities throughout my career: driving down roads in Mexico that are only inches wider than the wheels in search of Mexican beaded lizards, walking on high elevation sand dune formations in Colorado in search of horned lizards surrounded by 14,000 ft mountains, having my rubber boots get stuck with each step in a muddy stream in search of salamanders, slipping clumsily in rocky rivers covered with algal film in search of red-legged frogs, and of course countless nights of road cruising in search of creatures seeking warmth from the road. It is through these adventures that I have traveled to new places, seen incredible wildlife, made new friends, and observed first-hand what I had learned in school. For me, this is what makes fieldwork so addictive, and the desire to share my passion with others.

In Yuma, most students consider the landscape to be desolate, inhospitable, and generally unpleasant. To an extent, they are right. Films such as *Star Wars, Space Balls, 3:10 to Yuma*, and countless wartime movies portray precisely these qualities. But, when they become part of the science program at NAU and AWC, they learn the exact opposite. For me, this is the greatest benefit to being a professor. Engaging students into a world in which they are surrounded but never knew about.

Last year, a colleague and I were recipients of the HLCS grant in education. Through this, we hosted a training to educate people about flat-tailed horned lizard (*P. mcallii*) conservation and basic field survey methods. A handful of the participants had never walked beyond pavement, and were awestricken at the experience.

As a herpetologist, Yuma is a hot spot in terms of reptile and amphibian diversity; in the area, there are over 50 species, some of which are endemic. And, the overall biodi-

Two years ago, my Environmental Science students conducted research to increase rush milkweed germination and growth in an effort to improve native habitat restoration for the monarch butterfly. These students presented their research at a local conference, and were awarded best student poster.

versity is equally amazing, especially in a good rain year. With most people spending over 90% of their lives indoors, exposing students to their living surroundings, and watching them gain a similar passion, is truly rewarding.

As Director-at-Large for the HLCS, I am proud to see the support of the Society and the educational component that is so desperately needed for horned lizards, especially those on the cusp of becoming endangered or extinct. My goal is to bring an increased awareness to horned lizards and gain protection for them through education, awareness, and research. Lizards are an evolutionary oddity, with their less than athletic body forms, ornate horns, unique behaviors, and calm demeanors. It's no wonder that horned lizards are such curious creatures that capture our attention and bring out our inner children.

Two summers ago I had the opportunity to travel to the Galapagos Islands, and soon realized that I had found my second home among the marine iguanas that littered the islands, abruptly snorting salt and carelessly walking over one another while basking on shore.

*A large male short-horned lizard (*P. hernandesi*) from Mosca Pass in Colorado. As part of my dissertation work, I collected life-history, morphological, diet, and genetic data on this population to compare against the dwarfed populations of short-horned lizards in the San Luis Valley.*

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

Lifetime membership $300

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

Attwater's Prairie-Chicken Brood Survival— The invertebrate and red imported fire ant connection

By Dr. Mike Morrow, the Attwater Prairie Chicken National Wildlife Refuge Biologist

Fire ants were accidentally introduced to the U.S. in the 1930's from South America on board a ship at the Port of Mobile, Alabama. Eventually occupying the entire southeastern U.S., red imported fire ants (RIFA) first showed up in Attwater Prairie-chicken (APC) habitats around 1970 (http://www.extension.org/pages/14911/texas-quarantine-map).

While there are numerous studies that point to adverse impacts of RIFA on wildlife, the prevailing expert opinion until recently was that habitat loss and fragmentation in concert with adverse weather (extremes at both ends of the spectrum) and possibly genetic bottle-necking were the most important factors limiting APC populations.

Others speculated that the captive stock, which has without question saved the APC from certain extinction, was incapable of survival and reproduction in the wild. Intensive observations on eight APC broods at the APC National Wildlife Refuge in 2003 revealed that no chicks survived past 11 days post-hatch. Several dead or dying chicks were found with brood hens at night roosts, indicating that predation was not the sole cause of chick mortality. Necropsy of these chicks attributed cause of death to inanition (i.e., exhaustion, as from lack of nourishment) and dehydration.

Prairie-chickens, like most gallinaceous species (e.g., quail, pheasants, turkeys, grouse), are primarily insectivorous during their first few weeks of life. Therefore, based on the chick necropsy results and the fact that we were not seeing many invertebrates (insects, spiders, etc.) during the time that APC chicks were on the ground, we began what has become a long journey to determine if invertebrate abundance was indeed limiting APC chick survival, and if so, why?

But first, we had to find out what level of invertebrate abundance was necessary to support a prairie-chicken brood. Since there were no viable populations of wild APC remaining, we did the next best thing and compared invertebrates available to APC broods with those available to healthy greater prairie-chicken (GPC) (*Tympanuchus cupido pinnatus*) broods in Minnesota. Dr. John Toepfer and his colleague, Aaron Pratt, collected invertebrate samples in Minnesota, and refuge staff collected samples in APC range. This comparison revealed that samples from APC brood habitat contained 70% fewer insects than GPC brood habitat.

A review of the literature found that researchers at the Brackenridge Field Laboratory near Austin had observed a 75% reduction in non-ant arthropod numbers where RIFA were present compared to areas not yet invaded by RIFA. So we began our multi-year investigation of RIFA impacts on invertebrates available to APC broods.

To make a long story short, the aforementioned study funded by NFWF represents the culmination of several years of study which has included partners like Central Life Sciences, Texas Parks and Wildlife Department, The Nature Conservancy of Texas, and private ranchers, in addition to those mentioned above. In the NFWF study, which was conducted during 2011–2012, we (1) continued the evaluation of whether invertebrates were more abundant at successful brood sites compared to broods that failed during the first two weeks post-hatch; (2) evaluated various hen characteristics like hen source (wild-hatched versus captive), hen age, previous nesting experience, and time since release to determine whether any of these had significant impacts on brood survival; and (3) expanded the evaluation of RIFA on invertebrate abundance during May – mid-June (i.e., the APC's brooding period).

To assess the impact of RIFA

on APC brood habitat quality as indicated by invertebrate abundance, five areas ranging from 440–725 acres in Colorado (APCNWR), Galveston (Texas City Prairie Preserve), Goliad (2 private ranches), and Refugio (private ranch) counties received applications of Extinguish® Plus brand fire ant bait to reduce RIFA abundance. Extinguish® Plus was applied at the recommended label rate of 1.5 lbs/acre by helicopter during early November 2010 and again in late September 2011 during weather conditions appropriate for application. Invertebrate samples were collected from untreated and treated areas beginning the last week in April following treatment and continued for 3 consecutive bi-weekly periods through early-June each year.

Brood survival data were collected from 44 broods from 2009–2012. Of these, 21 (48%) were successful (i.e., still had chicks at two weeks post-hatch). Overall, median invertebrate numbers were 2.1 times higher at successful brood sites compared to unsuccessful sites (128 versus 60, respectively). No other attributes of hens (age, released from captivity or wild-hatched, years since release for captive-reared hens, or previous nesting experience or success with fledging chicks) hypothesized to affect brood success were significant. Median total invertebrates/sample was 1.4 times higher for treated sites compared to untreated controls. Median dry weight of invertebrates/sample was 1.6 times higher for treated sites compared to untreated controls.

Data collected in this study clearly demonstrate that availability of invertebrates during the first two weeks post-hatch is a major factor limiting survival of young APCs. This study also clearly demonstrated that the invasive RIFA has significantly reduced invertebrate abundance within historic and extant APC habitats. APC populations consistently declined during the 25-year period following invasion of APC habitat by RIFA circa 1970 (Figure 1). Therefore, it is likely that the introduction of RIFA played a significant role in the APC's plunge toward the precipice of extinction, and has frustrated recovery efforts in recent years.

The full report of this research is posted at www.attwater.org and at www.prairiegrouse.org.

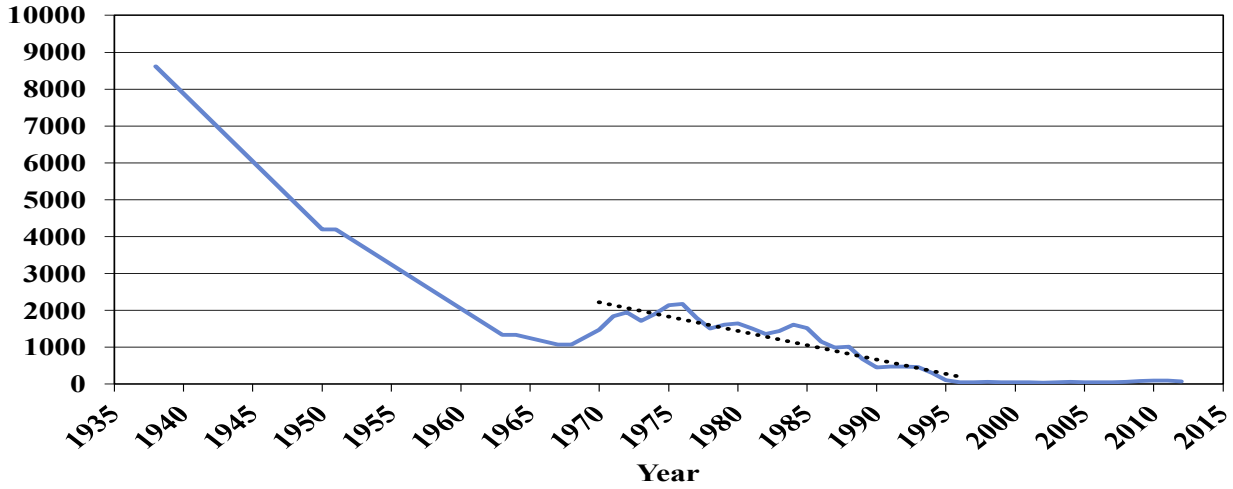

Figure 1. Attwater's prairie-chicken (APC) population trends 1937–2012. The dotted line indicates the 25-year average population trend following invasion of APC range by red imported fire ants circa 1970.

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

Return Service Requested

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. Contibutions are deductible to the extent allowable by law.

Printed on Recycled Paper

Table of Contents

***Phrynosomatics* is now sent electronically.**
To receive the electronic copy and be taken off the newsletter print list, please contact Katie Talbott at kmtalbott@mail.fhsu.edu.