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ABOUT SWCHR

Originally founded by Gerald Keown in 2007, SWCHR is a 501(c)(3) non-profit association, governed by a board of directors and dedicated to promoting education of the Association’s members and the general public relating to the natural history, biology, taxonomy, conservation and preservation needs, field studies, and captive propagation of the herpetofauna indigenous to the American Southwest.

THE SWCHR LOGO

There are several versions of the SWCHR logo, all featuring the Gray-Banded Kingsnake (*Lampropeltis alterna*), a widely-recognized reptile native to the Trans-Pecos region of Texas as well as adjacent Mexico and New Mexico.

ON THE COVER: Speckled Kingsnake, *Lampropeltis getula holbrooki*, Brazoria County, TX (Matt Hollanders). This photograph was voted the winner of the 2011 SWCHR Award for Excellence in Herpetological Photography.

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For information on becoming a member please visit the membership page of the SWCHR web site at http://www.southwesternherp.com/join.html.

BACKGROUND IMAGE: Elephant Tusk, Big Bend National Park, TX (Chris McMartin)
A CALL FOR PAPERS

Are you a field herpetologist or a herpetoculturist working with species native to the American Southwest? Do you have a paper or an article you have written for which you would like to find a permanent repository? Want to be assured you will always be able to share it with the world? Submit it to the SWCHR Bulletin for possible publication. Submitted manuscripts from SWCHR members, as well as non-members, will be considered.

To be accepted for publication, submissions must deal with herpetological species native to the American Southwest. Such topics as field notes, county checklists, range extensions, taxonomy, reproduction and breeding, diseases, snake bite and venom research, captive breeding and maintenance, conservation issues, legal issues, etc. are all acceptable. For assistance with formatting manuscripts, search ‘scientific journal article format’ on the internet and tailor the resultant guidance to suit.

Previously published articles or papers are acceptable, provided you still hold the copyright to the work and have the right to re-publish it. If we accept your paper or article for publication, you will still continue to be the copyright holder. If your submission has been previously published, please provide the name of the publication in which it appeared along with the date of publication. All submissions should be manually proofed in addition to being spell checked and should be submitted by email as either Microsoft Word or text documents.

Send submissions to swchrbulletin@swchr.org.
A Message from the President

With this second volume of the SWCHR Bulletin we are incorporating some editorial alterations that have been suggested by various members. Most significantly, the Bulletin will be devoted more to the publication of original herp-related articles, papers, natural history and breeding notes, range extensions, new county records, field trip reports, and such. This means there will be less of the nuts-and-bolts (but necessary) details of SWCHR’s operations and governance included in the Bulletin. This function will instead be shifted to a new circular, SWCHR News. You should have already received your first issue of the SWCHR News via email, but if you haven’t, contact the Executive Director at admin@swchr.org.

These changes have been instituted in the hopes of making the Bulletin into a more professional journal-like publication. Of course, in order for this goal to be accomplished, we will have to continue to receive submissions from you, the membership.

In this issue Toby Brock offers up some additional insights into his remarkable success in maintaining and breeding the sometimes difficult Northern Green Ratsnake (Senticolis triaspis intermedia). Saunders Drukker provides us with a note on his observations of the effects of the current drought on the Eastern Hognose Snake (Heterodon platirhinos) on the south-central Edwards Plateau. Editor Chris McMartin has undertaken a review of a relatively new book, Lizards of the American Southwest: A Photographic Guide, edited by Lawrence Jones and Robert Lovich, which promises to finally eclipse Hobart M. Smith’s iconic but very outdated 1946 Handbook of Lizards in the venerable Comstock natural history series, at least as far as southwestern species are concerned. And finally, I have put together some observations on the explosively invasive Rio Grande Chirping Frog (Eleutherodactylus cystignathoides campi) gathered during my forty-plus years of fascination with it (even though I am not really a frog guy!).

So far this year in south Texas rainfall has been at or slightly above long-term averages, the wildflower bloom has once again been spectacular as it marches northward, and it seems we could be enjoying a return to the stellar springtime herping that our region is justly famous for. Carpe herpetum!

Happy Herping,
Breeding and Incubation in Captive Northern Green Rat Snakes, *Senticolis triaspis intermedia* (Serpentes: Colubridae)

by Toby Brock

Introduction

The Northern Green Rat Snake (*Senticolis triaspis intermedia*) has a reputation for being an animal which can be quite difficult to successfully maintain and breed in captivity (Cranston, 1989 and 1990; Schulz, 1996). Based on my observations and results and those of others working with the species, this reputation seems to be well founded and deserved. Particularly challenging aspects of keeping *S. t. intermedia* are the successful breeding of adults, incubation of the eggs, and production of healthy offspring.

This article will discuss my results from breeding a pair of adult animals collected in the Santa Rita Mountains of southeastern Arizona, incubating the eggs, health of the resulting offspring, and deformities and other problems I have seen. I will also compare my results and observations with those of others who have successfully bred and reproduced the species.

Prebreeding Conditioning

For the purposes of this article, I will only briefly discuss the general husbandry techniques I have used to maintain this species, except where it is pertinent to breeding and reproduction. For more information on husbandry methods see Cranston, 1989 and 1990; Merker, 1999; Schulz, 1996; and Rhoads, 2008.

My adult pair has been in my care since January 2009, and as of this writing in February 2012 both snakes continue to thrive. They were given to me by Diego Ortiz, who had them treated for parasites by a veterinarian soon after their capture, which greatly influenced their excellent health and improved their quick acclimation to captive conditions. This pair has mostly been maintained in 41 quart plastic tubs in a rack with a temperature gradient (cool end in the 70s, warm end in the low/mid 80s Fahrenheit), water bowl, dry and moist hides, shredded aspen substrate, and numerous ventilation holes (Brock, 2011). In March 2011, the female was moved into a plastic cage roughly 35” wide x 23” deep x 12” high, also furnished with the above stated amenities. Food for this pair has mostly been live common mice of various sizes, up to large adults. Occasionally, the pair will take freshly killed or stunned mice.

This pair was brumated during the winter, in 2010 and 2011, to condition them for breeding the following spring and summer. The 2010 brumation was sporadic and interspersed with warm periods during which they were fed. After feeding, they were allowed to clear their guts and then cooled down again. Brumation in 2011 was constant, with no warming or feeding, although temperatures fluctuated between the upper 50s to the low 70s Fahrenheit. The snakes were brumated from the beginning of January through the end of February – about two months. Cooler temperatures were maintained by the use of a window unit air conditioner, due to the warm south Texas weather where the snakes are maintained. During brumation in both 2010 and 2011, the snakes’ heat tape was left on in order to prevent ataxia problems (Cranston, 1990). I have only witnessed them seeking warmth during brumation when temperatures drop into the low 50s Fahrenheit. When kept in temperatures of 60 – 70 degrees Fahrenheit, they seem to mostly sit inside hides positioned about halfway between the warm and cool ends of their tubs. During the two month period of brumation, the window is kept completely covered, and the room is kept dark – in keeping with making the snakes think they are in a dark winter hibernaculum (Love, 2000).

Breeding

At the end of brumation, the room the snakes are kept in was warmed up to active season temperatures (low – high 70s Fahrenheit). After several warm days small prey items were offered, gradually working up to normal active season sized meals over a period of a few weeks. Once the snakes had good post brumation sloughs, they were paired for breeding for a few days at a time. Between pairings/mating they were separated, fed and allowed to digest, and then reintroduced.

The purpose for brumating snakes in captivity as it relates to breeding is to give them a metabolic break and to cause the animals’ biological impulses to switch to the production of sex cells (Rhoads, 2008). Some herpetoculturists believe brumation is more important in males (of at least some species), and that sperm cells need to cool down in order to become viable (John Lassiter, pers. comm.). Due to these theories, I was very surprised when the snakes not only mated, but the female also went on to produce not only one but two clutches of fertile eggs in 2010. In the 2011 breeding season, they also mated (possibly several times) and the female again produced two clutches of fertile eggs. Cranston (1989) had difficulty getting fertilized eggs from *S. t intermedia* collected from the Chiricahua Mountains because his males would only mate with a female once per season—although his males would mate with other females during the same season.

Although most of the eggs laid by my adult female have appeared fertile at laying, not all of them have hatched. Some were obviously infertile or otherwise compromised, while others went full term and at or just prior to hatching, the baby snake(s) died in the egg. Some of the offspring from these clutches had minor deformities in the form of slightly kinked tails, tails which were shorter than normal, or a combination of the two. It is the common occurrence of these deformities plus the dead in egg offspring I have seen which has caused me to consider this species as a rather difficult species to successfully reproduce. There are many questions surrounding the issue of problematic reproduction in this species.

Incubation

I incubated the eggs of both 2010 clutches in shoebox sized plastic tubs which were kept inside 32 quart plastic tubs, in a snake rack with heat from heat tape running down the outside of the pegboard back of the rack. In the first clutch, temperatures ranged from the mid 70s to low 80s Fahrenheit, but most often were between 78 degrees and 80 degrees Fahrenheit. The second clutch was...
incubated in the same manner, but may have been subjected to temperature drops into the 60s Fahrenheit during cold weather during December. Both of these clutches were incubated on top of a section of fluorescent light diffuser which sat on top of wet perlite. The incubation tub had no ventilation holes but was opened once a week for air exchange and the tub lid sat loosely on the tub. Both of the 2011 clutches were incubated in smaller food storage tubs using a product called Hatch Rite as the medium, which has yielded excellent results for me with several other species of colubrids, including Pantherophis guttatus guttatus, Pantherophis guttatus mabillorum, Elaphe dione, and Orthriophis taeniurus taeniurus. (Brock, 2011).

Because one theory about deformities in snakes has to do with temperature fluctuations, for the second year of breeding these snakes, I bought an Exo Terra brand incubator, which has both heating and cooling capabilities – in order to hopefully keep temperatures as constant as possible. The incubator has a small fan which automatically kicks on when the unit begins to either cool down or warm up past a few degrees of what it is programmed for, and has both a regular and a quiet setting. For the first clutch of 2011, I chose to use the regular fan setting, and calibrated the incubator to 80 degrees Fahrenheit. There was very little fluctuation in temperature during this clutch’s incubation. I kept the second 2011 clutch in the same incubator, but a little cooler at about 77 degrees Fahrenheit, and used the incubator fan on quiet mode. This temperature difference was implemented due to the previous clutch hatching a bit smaller and thinner than the previous year’s offspring; and due to the theory that a longer, cooler incubation may allow the baby snakes to take a bit longer to develop and improve absorption of nutrients from the yolk, thus hatching larger and healthier (Terrence Cox, pers. comm.). Also, there seems to be a fairly wide temperature range which this species will tolerate, as Paul Lynum hatched a clutch at room temperatures which ranged into the mid 80s Fahrenheit. This seems to have sped hatching larger and healthier snakes, I have thought quite a lot about this idea due to developing babies. I have had issues with incubating Chinese Beauty Snake (O. t. taeniurus) eggs, and was not overly full of fluid. I discussed a theory in my 2011 SWCHR article that perhaps too much moisture may have played a role in any of my S. t. intermedia eggs, as the only dead-in-egg neonate I have seen was in an egg which had dented slightly in-egg neonate I have seen was in an egg which had dented in a bit, which is too wet. Authors state this problem in different ways, but it amounts to the same end result. An egg which is too full of fluid at hatching will sometimes cause the baby snake to suffocate, due to too much pressure (Kohler, 2005). The snake “drowns” from not having access to an air bubble which should form when the baby makes a hole in the egg, after the egg has dented in a bit, which should happen prior to hatching time (Rhoads, 2008). This has not been an issue in any of my S. t. intermedia eggs, as the only dead-in-egg neonate I have seen was in an egg which had dented slightly and was not overly full of fluid. I discussed a theory in my 2011 SWCHR article that perhaps too much moisture may have played a part in deformities of offspring— mainly due to work I had done with incubating Chinese Beauty Snake (O. t. taeniurus) eggs, and much conjecture about the results (Brock, 2011). However, I have largely discarded this idea in favor of others. One reason I have abandoned the theory is that to date, my healthiest clutch (the first) of intermedia eggs was also possibly the wettest as well.

Another common cause of neonates dying in the egg at hatching time is the egg being too full of fluid from incubation medium which is too wet. Authors state this problem in different ways, but it amounts to the same end result. An egg which is too full of fluid at hatching will sometimes cause the baby snake to suffocate, due to too much pressure (Kohler, 2005). The snake “drowns” from not having access to an air bubble which should form when the baby makes a hole in the egg, after the egg has dented in a bit, which should happen prior to hatching time (Rhoads, 2008). This has not been an issue in any of my S. t. intermedia eggs, as the only dead-in-egg neonate I have seen was in an egg which had dented slightly and was not overly full of fluid. I discussed a theory in my 2011 SWCHR article that perhaps too much moisture may have played a part in deformities of offspring— mainly due to work I had done with incubating Chinese Beauty Snake (O. t. taeniurus) eggs, and much conjecture about the results (Brock, 2011). However, I have largely discarded this idea in favor of others. One reason I have abandoned the theory is that to date, my healthiest clutch (the first) of intermedia eggs was also possibly the wettest as well.

As previously mentioned, I have seen deformities in several offspring from the adult pair of Northern Green Rat Snakes, and I have struggled to understand the cause(s) of them and to correct the underlying issue(s). I have discussed these issues at length with many herpetoculturists, some of whom have also kept this species and have also had difficulty successfully reproducing them in captivity.

Deformities in snakes are usually blamed on incorrect incubation temperatures or extreme fluctuations of temperatures during crucial stages of embryonic development. Issues with incorrect temperatures seem unlikely to be the culprit, in my opinion, as the latest two clutches were kept at very constant temperatures with very little fluctuation. The temperatures which I have used to incubate this species’ eggs are known to yield good results with most colubrid species.

According to Kohler (2005), deformities “are rarely… inherited from a parent.” However, we know that this is not always the case; as an example, captive lines of Texas Rat Snakes (Pantherophis obsoletus lindheimeri) often carry a gene which causes offspring to have deformed “bug eyes.” This is most likely due to heavy inbreeding (Rhoads, 2008). Because my adult Green Rat Snakes were wild collected, it is unlikely that they are genetically causing the deformities in their offspring due to inbreeding, although not completely out of the question since they were collected from the same population.

In the case of snakes which develop all the way to the hatching stage and then die before hatching, Kohler (2005) states that this is usually due to the dam having “vitamin and mineral deficiencies” before laying eggs. If an embryo has insufficient nutrients, it may develop fully, but then not be strong enough for the final push to get out of the egg. This is a strong possibility as a cause for the baby which was found dead in its egg in my fourth clutch (see table), as it actually had piped but then died before it got its head out of the egg. It was found with its head at the bottom of the egg, and also seemed to be tangled in the umbilicus. Gerold Merker (pers. comm.) also feels the condition of the parent(s) may be to blame for otherwise unexplained deformities in offspring.

Deformities and Dead-in-Egg Occurrences

<table>
<thead>
<tr>
<th>Eggs</th>
<th>Hatched</th>
<th>Incubation</th>
<th>Deformities/Anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 2010 Clutch</td>
<td>5</td>
<td>4</td>
<td>88-92 Days</td>
</tr>
<tr>
<td>Second 2010 Clutch</td>
<td>5</td>
<td>3</td>
<td>93-94 Days</td>
</tr>
<tr>
<td>First 2011 Clutch</td>
<td>5</td>
<td>4</td>
<td>80-83 Days</td>
</tr>
<tr>
<td>Second 2011 Clutch</td>
<td>4</td>
<td>3</td>
<td>87-88 Days</td>
</tr>
</tbody>
</table>

Table – Clutch and offspring data from four clutches produced by my long-term captive Northern Green Rat Snakes from the Santa Rita Mountains
was incubated only slightly warmer than others at about 80 degrees Fahrenheit; however the babies started hatching at about 80 days which is at least a week earlier than all of the other clutches. These neonates were smaller and thinner and had absorbed less yolk than offspring of the other clutches – although interestingly these all had normal length tails, some had slight tail kinks. They also seemed to be more agitated than other babies, and almost seemed to be driven to hatch and escape from something. Another thought which is similar is perhaps disturbances to the eggs/embryos during developmentally crucial stages could disrupt development – e.g. opening/closing the incubator door, jarring the incubation tub while checking on egg condition, etc. This is not a far-fetched theory in my opinion, since the species is easily disturbed and stressed. A disturbing thought was put forth by Diego Ortiz (pers. comm.)—maybe the deformities I have seen (kinked tails and tails which are shorter than normal) are due to different factors. One could be incubation related while the other is due to a genetic issue—or condition of the dam.

Conclusion

After my first clutch of *Senticolis triaspis intermedia* hatched out perfect and healthy in 2010, I may have become somewhat overconfident in my assessment of this species and my abilities to successfully keep and breed them. While the adults are the outward picture of perfect health, who knows what problems lie beneath the surface? Perhaps the female is suffering from some lack of vitamins and minerals—and perhaps this could be due to producing two clutches per season. It is commonly believed this subspecies of *Senticolis triaspis* only produces one clutch per year (Schulz, 1996), although several herpetoculturists commonly double-clutch them. Perhaps I have neglected some other aspect of husbandry which has contributed to the deformities in the offspring—maybe the female needs extra calcium during the breeding season. I dusted the food of breeding female snakes with a calcium powder for years until I began to see over-calciﬁed eggs from female Beauty Snakes (*Orthriophis t. taeniurus*); at which time I discontinued the practice. Perhaps it is more than one issue which, combined, cause these anomalies. I hope to discover and correct whatever is causing the problems I have seen in neonatal *S. t. intermedia*—and make public my results and theories.

References


Southwestern Drought Effects on Eastern Hognose Snake (*Heterodon platirhinos*)
Movement in the Central Texas Hill Country
(Serpentes: Colubridae)
by Saunders Drukker

The southwestern portion of the United States has experienced a drastic drought for the past few years; in Texas this drought ranks among the worst ever. While the drought and high temperatures curtailed most snake movement, resulting in a summer with limited finds, I actually experienced an increase in Eastern Hognose Snake (*Heterodon platirhinos*) findings, a snake I used to associate with more humid/wet weather. Usually I find one or two of these snakes a year, but the spring and summer of 2011 brought about a major increase in findings.

All together between some close friends and I, we found seventeen Eastern Hognose snakes between late April and July. Two of these were known to be gravid females; the eggs of one of these females were incubated in captivity and the babies released. Five of the specimens were “dead on the road” (DOR), one of these sadly being the most beautiful hognose I have seen to date. While the exact ratio of male to females is not known due to the DOR specimens, of the live finds four were definite females, three were males and the others could not be sexed (often due to me not seeing the snake myself, but rather photographic evidence given to me by friends).

Surprisingly, the snakes did not seem to exhibit any pattern in the time of day, weather, or temperature they decided to move. I found three in a two hour period between 3:00 and 5:00 p.m. in temperatures over 100 degrees Fahrenheit, while some were found on cool mornings and others were found right at sunset. Another interesting observation is that though we found gravid females, none of the finds were juveniles—the youngest specimens were approximately two years old.

From this data not much can be determined about the snakes’ reasons for moving in such large numbers, but another factor may be at work here. While the hognose sightings rose, the amount of Gulf Coast Toads (*Ollotis nebulifer*), the number one food source for hognoses in the area, was lower than most years. This is to be expected due to the low amount of rainfall causing the toads to retreat into burrows underground, with burrows usually more secluded than normal. This lack of food may have caused the hognoses to move more often than normal in their search for food. This was seen as well in another toad eating species, the Eastern Blackneck Garter snake (*Thamnophis crytopsis ocellatus*), which also boasted slightly higher numbers than usual. Another observation supporting this hypothesis is that in late July and early August when the drought reached its worst, and toads were almost impossible to find, the hognose sightings stopped altogether.

There were many times this spring when I thought I had finally figured out hognose movements in the area, but each time, another snake found in the opposite conditions would shatter my assumptions. The movement was certainly not normal, and was surprising since the hognose numbers were greater than numbers of snakes I would expect to find in the hot weather, namely Western Coachwhips (*Masticophis flagellum testaceus*) and Texas Patchnose Snakes (*Salvadora grahamiae lineata*), both of which were also found in greater numbers than previous years. Moreover, on a slightly different note, the hot dry weather turned up a Texas Nightsnake (*Hypsiglena jani*), a snake usually found further west or south, though it is not unheard of in the Texas Hill Country.

Overall, I am excited to see if the Hognose will be moving as much this spring, which is already the wettest in the past few years, or if they will return to their normal movement.
Book Review: *Lizards of the American Southwest: A Photographic Field Guide*

Review by Chris McMartin

Although snakes seem to get the lion’s share of attention among many field herpers, the lizards in the SWCHR region are much more conspicuous, being largely diurnal and often brightly colored. *Lizards of the American Southwest* is one of the latest treatments covering the lacertilian subclass, and it does an admirable job.

This hefty tome weighs in at 567 pages, and is larger in dimension than other field guides, such as the Peterson series. I have difficulty calling it a true “field guide” in that I don’t foresee myself lugging it on hiking forays, but it would be useful to study before an outing, and to keep in one’s vehicle for “near-real-time” identification purposes.

Lawrence Jones and Robert Lovich are but the editors of this volume; the contributing authors’ list reads practically like a who’s-who of lizard academics and enthusiasts; a good number of these 77 authors are familiar to anyone familiar with other published works on the region’s herpetofauna, or perusing online herp forums. Each species’ section was written by the author most familiar with that particular animal, but the format and style remains fairly consistent across all the species accounts—a testament to the efforts of the editors.

The book opens with a foreword by the esteemed Laurie Vitt and remarks by the editors. It then offers an extensive discussion (nearly the first hundred pages) of the regional habitat features, life history and behavior, anatomical features, taxonomy, tips for observing lizards, a selection of ideal viewing locations, and even sections on captive animals, conservation issues, laws, and ethics. It manages to address these latter topics relatively even-handed without sounding biased for the most part, although in a few of the species accounts there is a small amount of “soapbox” material (in the case of *Calonryx variabilis*, a notoriously-difficult animal to find, the account author mentions running across numerous poachers on some nights; other accounts urge readers not to collect, or even touch, otherwise-unprotected species). There are also a couple of instances of dubious information (requiring a permit just to photograph lizards in Texas—a topic of debate in the herping community; and erroneous yet oft-repeated etymology of the term “mountain boomer” in reference to collared lizards—a sore subject for me!) but generally the book keeps the editorializing to a minimum and admits its shortcomings; for example, where further research is needed on a particular species.

Species accounts are arranged by currently-recognized family with a brief overview of the family itself. Species within the family are arranged alphabetically by scientific name. Each species is generally allocated 4 pages (a few are only 3 pages) which contain a description, sexual variation, similar species, habitat, range, natural history, viewing tips, taxonomic notes, subspecies, and general comments. Typically four photos accompany the text for each species—not necessarily commensurate with being labeled a “photographic field guide.” In addition, the selected photos, while helpful in developing a gestalt for the animal in question, do not always highlight field marks (the telltale side blotches on some *Uta stansburiana* specimens are not easily visible, for example) or capture the variation in color and pattern for some species. Granted, this is hard to accomplish for some of the less-common species, but adding callouts to distinguishing characteristics either graphically or in the photo captions would have been a nice addition.

Maps accompany each species account, and they are generally good. I especially appreciate that they show an species’ entire range without cropping, regardless of whether that range extends into the eastern United States (outside the scope of the book) or into Mexico. However, various colors are used to differentiate subspecies, and each map includes a note to refer to a legend located at the back of the book to match subspecies with color. This is tedious, and could have been easily remedied by simply overlaying the maps with subspecies names or including a small key under each map as appropriate.

This book is written broadly enough to appeal to a wide audience, from beginning amateur naturalists to seasoned professionals. As such, inclusion of English units of measure (in addition to metric units) would have been nice, as American laypersons can generally more easily “visualize” the size of an animal in inches, and temperatures in Fahrenheit, than millimeters and Celsius, respectively. Add to that the fact that American paper currency is just over 6 inches wide, providing a handy field reference, and one wonders why either both units of measure weren’t included, or at the very least, a millimeter scale wasn’t printed on the inside cover as in other field guides.
While there is discussion of ethics and law pertaining to capture of Southwestern lizards, the reader may still cringe at the highly-specific locality information given in some of the species accounts—in some cases, down to particular local roads to search. This information is certainly helpful to those only wishing to observe, but it's equally helpful to less scrupulous readers.

As a bonus, after the species accounts there are brief overviews on the lizards of Baja California, Sonora, and Chihuahua, Mexico. Following these chapters is a checklist of all covered species by state, including Mexico. The book concludes with acknowledgments, a list of web and print resources, a glossary, and representative thumbnail photographs of each genus.

The discrepancies I mentioned in this review are the only problems I encountered in an otherwise excellent volume on an appealing subject. I read the book cover to cover merely dreaming of being in the field, so I have yet to use it to identify difficult species (such as pretty much any of the *Aspidoscelis* complex), but the descriptions appear to be useful in doing so. I also found helpful information on plant associations and preferred temperatures for many of the species—information typically lacking in more generalized guides covering more types of reptiles, both reptiles and amphibians, or broader geographical regions.

At a suggested price of $24.95 at the time of this review, I consider this book a bargain given the amount of information presented. Whether you're just starting out in field herping, are branching out from focusing on other reptiles, or are looking to take your lizard observations to the next level, I highly recommend this book.

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*(Anura: Leptodactylidae)*

by Tom Lott

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**Introduction**

The ranges of most amphibians and reptiles are generally considered to be almost static unless viewed through the prism of geologic time. In comparison to birds and mammals, of course, these groups have a relatively low mobility during their lifetimes and consequently may require several generations to appreciably alter their known distributions.

Exceptions to this generalization, however, are the occasional species that benefit from the agencies of humans, introducing them into areas they might never occupy if left to their own devices. Among the most successful amphibians and reptiles in exploiting unintentional human transport, as judged from their invasion of temperate zones where they must deal with at least a few months of unfavorable winter weather each year, are the Mediterranean Gecko (*Hemidactylus turcicus*), the Greenhouse Frog (*Eleutherodactylus planirostris*), and, most recently, the Rio Grande Chirping Frog (*Eleutherodactylus cystignathoides campi*).

The Rio Grande Chirping Frog in Texas was originally described in 1915 by Leonard Stejneger on the basis of specimens collected in the Lower Rio Grande Valley by R.D. Camp, who apparently was the first naturalist to note their presence. From that time until 1976 the Rio Grande Chirping Frog was presumed to be another of several species of herps that are commonly described as “endemic” to the Lower Rio Grande Valley of Texas when they are actually more widespread, primarily Mexican forms that happen to reach their northernmost distributional limits at the delta of the Rio Grande. Ironically, the state of Texas briefly placed this species on its endangered/threatened list, along with the other “Valley endemic” reptiles and amphibians, at about the same time its explosively invasive nature was being realized (Anon., 1978).

**Methods**

The purpose of this paper is to somewhat more accurately estimate the current distribution of *Eleutherodactylus cystignathoides campi* within the United States and, in the process, provide documentation of several new county records. In attempting to accomplish this task it has become apparent that the accepted method of establishing the distributions of reptiles and amphibians (involving depositing physical voucher specimens in recognized museum collections, awaiting expert taxonomic verification, etc.) is inadequate when dealing with a species that is experiencing a rapid, invasive range expansion.

For example, the first “official” record for *Eleutherodactylus cystignathoides campi* from Brazoria County, Texas (which is adjacent to the dense, long known Houston population) appeared only in 2005 (McCoid, 2005). Evidence indicates, however, that the chirping frog...
was present in Brazoria County almost 30 years earlier. A specimen from the town of Brazoria, collected by one of William K. Davis’ field biology classes from Southwest Texas State University in 1976, resided in a study collection at the university (pers. obs.). When asked about the specimen, Davis replied that it was genuinely from that locality and that he had intended to publish a note about it, but had never gotten around to it (Wm. K. Davis, pers. comm.). This was three years prior even to the “official” announcement of the Houston population (Quinn, 1979).

Similarly, the first record indicating that *Eleutherodactylus cystignathoides* could have established a population outside the Lower Rio Grande Valley (LRGV), in San Antonio, Bexar County, was published in 1976 (Mather and Dixon, 1976). However, almost seven years prior to that, on 7 November 1969, I collected a single adult specimen of *E. a. campi* just a few meters inside the southern limits of that city, indicating that the taxon had likely been present in Bexar County for some time before its announcement to science. The failure of both Davis and myself to make timely notice of our respective discoveries is symptomatic of a “time lag” that is practically built into the traditional procedure for documenting range extensions and one which is counterproductive to our ability to accurately determine the up to date distribution of dynamically invasive species such as the Rio Grande Chirping Frog.

Consequently, I have employed the option of examining records that, while they may be short of the maximum desirable scientific standards, appear at face value to be eminently reasonable. Such records are grouped into two categories: “fully accepted” and “provisional.”

**Fully accepted records** - Records from Dixon (2000) are considered to represent a baseline for this study, although citations for literature records prior to that publication are included where they are known. Literature and web records from the post-Dixon (2000) period have been evaluated on a case-by-case basis and are listed in the Literature Cited section. Records from the H.E.R.P. database of the North American Field Herping Association (NAFHA) that are accompanied by readily identifiable photo or audio vouchers are also considered full records (shown in green on the accompanying map), requiring no further documentation.

**Provisional records** - Undocumented records, mostly from the aural survey effort of Wells and Stephenson (2002), that are considered reasonable and likely valid but requiring further documentation are termed “provisional.” These records are valuable in pinpointing potential localities for further investigation to obtain vouchers. They are shown in orange on the map and indicated in the county listing with an asterisk.

**New county records**

**Atascosa County, Texas** - Pleasanton (N28.983015 W98.524039). 30 December 2005. Coll. by Tom Lott. NAFHA 55695 (photo voucher). Specimen was found under surface cover at 1446 hrs in a residential neighborhood within a sandy Live Oak savanna association. This species was absent from this site for the initial two decades that I lived there but has become established within the past 10-12 years, seeming to eb and flow in abundance with annual precipitation cycles, being seldom seen/heard during periods of drought but rebounding rapidly when rainfall resumes. Presumably the frogs find refuge from xeric conditions in the abundant pocket gopher tunnels that honeycomb the sandy soil, as they are not generally to be found under surface cover during dry periods.

**Goliad County, Texas** - Goliad (no specific locality) is accepted in this study as a provisional record based on evidence provided by Elizabeth Dodd-Ellis (Dodd-Ellis, pers. comm.), who is employed by the Texas Parks and Wildlife Department at Goliad State Park. Ms. Ellis has established to my satisfaction that she regularly hears this species in the Goliad area. A photo or audio voucher is necessary, however, to promote this record into the fully accepted category.

**Victoria County, Texas** - 1.21 Km (0.75 mi) WNW US 77-Coleto Creek bridge (N28.716836 W97.053553). 18 October 2008. Coll. by John Williams (w/Toby Brock, Terry Cox, Gerald Keown, and Tom Lott). NAFHA 102449 (photo voucher). Specimen was found under a plywood slab within a mixed hardwood forest along Coleto Creek. Significantly, this specimen was found a considerable distance from the nearest human habitation in a decidedly non-edificarian situation. This duplicates the experience of other observers in the southeastern portion of Texas and possibly indicates this species may be carving out a niche for itself in the natural environment and becoming less dependent upon human disturbances for its survival in those locales.

**Current County/Parish Records for *Eleutherodactylus cystignathoides campi* in the US**

Anecdotal Observations on the History of the San Antonio Population

The rate of expansion of introduced populations of the Rio Grande Chirping Frog can only be roughly estimated by examining extremely anecdotal evidence. Fortunately, I recorded my impressions surrounding the San Antonio population in my journal at the time. As mentioned above, I found my first San Antonio specimen in November, 1969, barely inside the city limits of San Antonio, where the Palo Alto College now stands, near the intersection of I-410 and the Palo Alto Highway (TX 16). I was thoroughly aware of the oddity of the find and concentrated much of my efforts in the field to seeking additional specimens in similar surrounding areas. Additionally, at the time I lived in a residential area located only 4.2 Km (2.6 mi) NE of this original site and devoted a substantial amount of time to unsuccessfully seeking and listening for this frog at home. This would indicate that E. c. campi was not then generally distributed in that area.

My efforts were unrewarded until, in February, 1972, after an additional two and a half years of searching, my wife and I found an additional three adult specimens beneath weathered tarpaper and cardboard at an impromptu dump site 2.3 Km (1.4 mi) directly east of the original site.

In May of 1973 Charles M. Mather collected two specimens of E. c. campi at the junction of I-410 and Bandera Rd. (TX 16) in northwestern San Antonio, 18.7 Km (11.6 mi) NNW of my original Bexar County specimen (Mather and Dixon, 1976). By coincidence I had lived within 5 Km (3.1 mi) of that locality at approximately the same time (1971-1973). Although I routinely investigated a number of trash sites in the general neighborhood, I neither found nor heard E. c. campi in that area at that time (although I did not examine the specific area from which Mather's specimens were collected). Again, this would indicate that there were a number of discrete, localized sites where this frog had been introduced and that it was not generally distributed in the intervening zones.

My next encounter with Bexar County specimens happened in January of 1975, when my wife and I found a total of twelve specimens beneath trash in an area very near the 1972 site. These frogs occurred in two distinct size classes, definitely indicating the colony was reproducing successfully at that location, and possibly that it was expanding.

By the end of the 1970s, under the appropriate conditions, Rio Grande Chirping Frogs could be heard almost anywhere in San Antonio, including even the north-central and north-eastern portions, which were most distant from the “original” locality. Thus it appears that this tiny frog was introduced at multiple locations, probably beginning in the mid-1960s. Judging from my inability to find them in localities near known sites, these initial introduction points probably remained as relatively discrete populations for a number of years after the initial introduction. Gradually, however, after achieving reproductive success, these discrete colonies likely began to spread out and coalesce with other adjacent colonies, eventually attaining the more-or-less uniform coverage we see in the San Antonio area today. Doubtless also, new introductions have continued over the years.

Discussion

Even though I am confident the evidence assembled in this paper provides a more accurate estimate of the current distribution of E. c. campi than has existed previously, I remain concerned it significantly underestimates the total extent of the range occupied by this form. Despite adopting a more liberal policy in considering possible new localities, the objective remains hampered by a dearth of any kind of reports of this frog from many areas where it almost certainly exists.

In general, I would speculate virtually every county in Texas east of or along I-35 likely harbors at least one or more localized populations of E. c. campi. If, as intimated in the above account of the Victoria County record, this species has begun to occupy a natural niche in the eastern and southeastern portions of the state, it appears previously localized, largely edificarian populations in those areas could become more generally distributed. Given the current northernmost localities for this species (i.e., Dallas and Tarrant counties in Texas and Caddo Parish in Louisiana), it should not prove surprising to discover it in southeast Oklahoma and southwest Arkansas.

The virtual absence of records for E. c. campi to the west of the I-35 corridor is puzzling but could merely represent a sampling anomaly. However, the existence of the very similar and naturally-occurring
Cliff Chirping Frog (Eleutherodactylus marnockii) along the Balcones Fault Zone and on the Edwards Plateau presents the possibility of interaction between it and E. c. campi. I am presently unaware of any reports of the two species occurring sympatrically, although such situations doubtless exist along the Balcones Fault Zone. Consequently, extra care should be exercised in the evaluation of aural records from localities where both species may occur as their vocalizations are quite similar, especially to the untrained ear.

In Louisiana, and potentially in portions of southeastern Texas, the Rio Grande Chirping Frog also faces the prospect of competition from a congenereic rival, the similarly invasive Greenhouse Frog (Eleutherodactylus planirostris), which has been moving westward across the Gulf states from Florida in a manner very similar to that employed by E. c. campi from the west and south (i.e., presumably in potted plants).

Finally, one of the more intriguing questions concerning the explosive range expansion of E. c. campi during the past four and a half decades is: why did it begin, apparently during the 1960s, when the species had been present in its natural (?) range in the Lower Rio Grande Valley at least since its description in 1915 and probably for many hundreds—if not thousands—of years previously? We may never know the answer to this for certain but, if transport within commercial potted plant containers is the actual mode of introduction, we may assume that some sort of major logistical change occurred in the LRGV horticultural industry around that time. However, the transport of plants from the Valley northward to other portions of the state has a long history (especially concerning palms and other tropicals) that vastly predates the mid-1960s.

**Literature Cited**


2011 Award for Excellence in Herpetological Photography
Presented to Matthijs Hollanders

On February 23, 2012 Matthijs Hollanders of Houston, Texas became the recipient of SWCHR’s 2011 Award for Excellence in Herpetological Photography. Matthijs, who has contributed countless photographs to the SWCHR web site over the past two years with six Photo of the Month wins to his credit, submitted this image of a Speckled Kingsnake (Lampropeltis getula holbrooki) last April and it was selected as our Photo of the Month for April 2011. Now his Speckled Kingsnake image has won him SWCHR’s annual Award for Excellence in Herpetological Photography. This award consists of a commemorative plaque-mounted certificate and a $150 cash award.

When we asked Matthijs to tell us a little about himself and his winning photograph, he was kind enough to do so. “For as long as I remember, I’ve had a passion for nature. This was fueled by my parents, and a general love for nature quickly progressed to birding in particular. However, after finding my first snake (a water snake of sorts) along a bayou in my suburb of Houston, I fell in love with snakes. After a year or two of casually looking for snakes without knowing much about them, I met several great herpers of the area who quickly taught me the way. My excitement in snakes has not withered, although I have now broadened my interests into all reptiles and amphibians. I found the Speckled Kingsnake in my photograph two years ago, and it was the first one I had ever flipped under a board. It was an incredibly exciting moment, and quite early in my photography career. My father has always let me use his Nikon D300 and lenses, and this photograph was taken using natural light and a 105mm macro lens. Most of my herpetological photographs are now taken with that same equipment, although a wide-angle lens is often found on the camera to incorporated the animal’s habitat. Furthermore, I have been particularly focusing on using flash with a soft box in combination with natural light. I have been saving money for a long time now with hopes of investing in my own DSLR and equipment, and by this summer I should have my own stuff.”

The Award for Excellence in Herpetological Photography will continue to be presented on an annual basis. SWCHR is very pleased with our first five years of having sponsored this award program that allows us to recognize and reward individuals who demonstrate a high degree of photographic excellence in the field of herpetology. For more information on how to participate in this program, please visit the SWCHR web site. During the prior four years SWCHR’s Award for Excellence in Herpetological Photography has also been bestowed on Jason Penney of Uvalde, Texas, Gary Nafis of Seattle, Washington, Will Wells of Surprise, Arizona, and Travis Dimler of Gail, Texas.
As a member of the Southwestern Center for Herpetological Research, I subscribe to the Association’s Code of Ethics.

Field activities should limit the impact on natural habitats, replacing all cover objects, not tearing apart rocks or logs and refraining from the use of gasoline or other toxic materials.

Catch and release coupled with photography and the limited take of non-protected species for personal study or breeding use is permitted. The commercial take and sale of wild-caught animals is not acceptable.

Collecting practices should respect landowner rights, including but not limited to securing permission for land entry and the packing out of all personal trash.

Captive-breeding efforts are recognized as a valid means of potentially reducing collection pressures on wild populations and are encouraged.

The release of captive animals including captive-bred animals into the wild is discouraged except under the supervision of trained professionals and in accordance with an accepted species preservation or restocking plan.

The disclosure of exact locality information on public internet forums is discouraged in most circumstances. Locality information posted on public internet forums usually should be restricted to providing the name of the county where the animal was found. When specific locality data is provided on one in confidence, it should be kept in confidence and should not be abused or shared with others without explicit permission.

Other members of the Association are always to be treated cordially and in a respectful manner.