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Cover: Western foxsnake, *Elaphe vulpina*. While checking bluebird nest boxes in Will County, Illinois, CHS Membership Secretary Deb Krohn was greeted with this sight. The former occupants were tree swallows, however, not bluebirds. Photograph by Bob Bryerton.

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An Overlooked Book Relating to the Herpetofauna of Illinois

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The senior author was recently lucky in obtaining a book entitled *An Essay Toward a Natural History of La Salle County, Illinois, in Two Parts: Part II—Geology and Zoology* by John William Huett. This book was published in 1898 by Fair-Dealer Printing in Ottawa, Illinois, and probably was of very limited circulation. Philip W. Smith (1961) failed to cite this reference. Nor, with regard to the geology of the state, was it cited by Willman and Payne (1942) or Wiggers (1997).

We wish to bring this book to the attention of anyone working on or interested in the herpetofauna of Illinois. We include notes on Huett's nomenclature and natural history observations.

Huett used the spelling *Eutaemia* for *Eutaenia*, the generic name in common use at the time for the garter and ribbon snakes (see Fitch, 1980). This name was used in three combinations: *Eutaemia sirtalis*, *E. faireyi* and *E. proxima*. Huett also refers to *Bascaniom constrictor*. Wilson (1978) lists *Bascanion constrictor* as a synonym for *Coluber constrictor*. These were apparently the first usages for *Eutaemia* and *Bascaniom*, and undoubtedly were typographical errors by the author or publisher.

Huett referred to *Cistudo Carolina (= Terrapene carolina*) as not numerous. But we feel this was probably *Terrapene ornata*, which is found in adjacent Whiteside and Lee Counties, although *Terrapene carolina* has been recorded from several localities within the Chicago area (Phillips et al., 1999). *Chrysemys picta* was cited as common with "sides marked with bright red." *Chelydra serpentina* was noted as common, and *Aspidonectes spinifer* (= *Apalone s. spinifera*) as common in the Illinois River and the canal (i.e., the Illinois–Michigan Canal). The only saurian species listed is *Eumeces fasciatus* "on rocks near old fair grounds."

The Serpentes were of greater diversity. Huett mentions the spreading adder, *Heterodon platyrhinus* (= *H. platirhinos*) round about the canyons. The water snakes, *Tropidonotus sipedon* (= *Nerodia sipedon*) and *T. rhombifera (= N. rhombifer*) and Graham's crayfish snake, *T. grahami* (= *Regina grahamii*) are cited, but without comments. It is interesting to note that *N. rhombifer* has been reported from the border of Woodford and Marshall counties, and possibly extended further northward. Huett cites *Eutaemia sirtalis* (= *Thamnophis sirtalis*) and probably *E. faireyi* (= *Thamnophis proximus*) and *E. proxima* (= *T. proximus*) as being found within the county. *T. proximus* was reported from Lee county by Smith (1961) and Phillips et al. (1999).

The species *Bascaniom constrictor* (= *Coluber constrictor*), *Cyclophis vernalis* (= *Liochlorophis vernalis), Coluber obsoletus* (= *Elaphe obsoleta*), *Ophibolus doliatus* var. *triangulus* (= *Lampropeltis triangulum*) and *Ophibolus calligaster* (= *Lampropeltis calligaster*) are cited as found within the county, but only the latter species cited as "being quite common."

The Banded or Yellow Rattlesnake, *Crotalus horridus*, and the Prairie Rattlesnake or Massasauga, *Caudisona catenala* (= *Sistrurus catenatus*; presumably *catenala* is a typo for *catenata*), are listed as "both becoming very scarce." The latter species has been reported from Cortland, DeKalb County (Wright, 1941). DeKalb County was also plotted by Smith (1961) and by Phillips et al.(1999) as a pre-1980 voucher. Prior to construction of Edgebrook Country Club in extreme southern DeKalb County (Sandwich area), massasaugas were reported there by several individuals familiar with this species, including Sidney Allen, groundskeeper at Oak Ridge Cemetery and reliable friend of the senior author. This area bordering Somonauk Creek appeared to be ideal habitat for this species when examined by the senior author on numerous occasions. Prior to construction of Lake Holiday, northern LaSalle County was examined by David Sherman, an avid amateur herpetologist, who reported (pers. com.) that considerable suitable habitat was still available.

The amphibian fauna is rather short with four species of anurans cited. The leopard frog, *Rana viresens* (= *Lithobates pipiens*; presumably *viresens* is a typo for *virescens*) and bullfrog (= *L. catesbeianus*) are cited. *Hyla versicolor* are mentioned as "often heard, not so often seen. Their cry indicates a state of the atmosphere, not rain necessarily." The last species Huett mentions is the warty toad, *Bufo lentiginosus* (= *Anaxyrus americanus*) which is "found about every garden, and it's the gardener's friend and assistant." Note that we here follow the nomenclature of the recent publication by Frost et al. (2006), in which the systematics of North American anurans has been drastically changed.

Only two species of salamanders are cited, with *Ambystoma punctatum (= Ambystoma maculatum*) remarked as "this handsome animal, from five to eight inches long, black above, with round yellow spots on each side of the back, and a slimy look; is sometimes found in cellars and other damp, cool places. It gives out a milky fluid from pores on its back," and the mudpuppy, *Menobranchus macculatus* (= *Necturus maculosus*), which he calls the water dog, or dog fish as "found in still water with muddy bottoms, and known by its gills, which form tufts on each side of its head. It is very active and hard to catch, and should not be taken in the hand." The reason for the caution against holding a mudpuppy is not clear to us. The specific name is apparently in error, as we cannot find the use of a double *c* having been previously cited in the literature.

Huett was very conservation minded and mentions under the water power section that man is "so capable in his unreasoning anxiety to get rich and to improve every inch of land around

him, that he stops not to inquire what the result of his improvements will be, but rashly ventures to destroy the delicate balance" of nature.

We feel this publication is of historical importance for anyone working on the herpetofauna of Illinois, and also of interest for its usage of systematic names.

Literature Cited

Fitch, H. S. 1980. *Thamnophis sirtalis* (Linnaeus). Common garter snake. Cat. Amer. Amph. Rept.: 270.1-270.4.

Frost, D. R., T. Grant, J. Faivovich, R. H. Bain, A. Haas, C. F. B. Haddad, R. O. de Sá, A. Channing, M. Wilkinson, S. C. Donnellan, C. J. Raxworthy, J. A. Campbell, B. L. Blotto, P. Moler, R. C. Drewes, R. A. Nussbaum, J. D. Lynch, D. M. Green and W. C. Wheeler. 2006. The amphibian tree of life. Bull. Amer. Mus. Nat. Hist. 297:1-370.

Huett, J. W. 1898. An essay toward a natural history of La Salle County, Illinois, in two parts. Part II—Geology and Zoology. Ottawa, Illinois: Fair-Dealer Printing. 172 pp. + 2 pp. index.

Phillips, C. A., R. A. Brandon and E. O. Moll. 1999. Field Guide to Amphibians and Reptiles of Illinois. Illinois Nat. Hist. Survey Manual (8):1-282.

Smith, P. W. 1961. The amphibians and reptiles of Illinois. Illinois Nat. Hist. Surv. Bull. 28(1):1-298.

Wiggers, R. 1997. Geology underfoot in Illinois. Missoula, Montana: Mountain Press Publ. Co.

Willman, H. R., and J. N. Payne. 1942. Geology and mineral resources of the Marseilles, Ottawa, and Streator quadrangles. With an introduction to mineral resources by W. H. Voskuil. Illinois State Geol. Survey Bull. (66):1-388 + maps and plates boxed.

Wilson, L. D. 1978. *Coluber constrictor* Linnaeus. Racer. Cat. Amer. Amph. Rept.: 218.1-218.4.

Wright, B. A. 1941. Habit and habitat studies of the massasauga rattlesnake (*Sistrurus catenatus catenatus* Raf.) in northeastern Illinois. Amer. Midl. Nat. 25(3):659-672.

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A Simple Restraining Device for Venomous Snakes

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Abstract

We would like share with the community, the design of a simple restraining device we developed (or reinvented) based on an idea by my 7-year-old son. Since we only handle bushmasters, our main goal was to have built-in protection for the osteo-tendinous frame in the cervical area which, in *Lachesis*, requires extra care. The device has proven to be extremely effective in its main goal and also very simple to use, build and clean.

In the daily inspections in our "Serra Grande Center for Captive Reproduction of *Lachesis muta*," we often have to immobilize rather large bushmasters (up to 9 ft), sometimes for long periods of time.

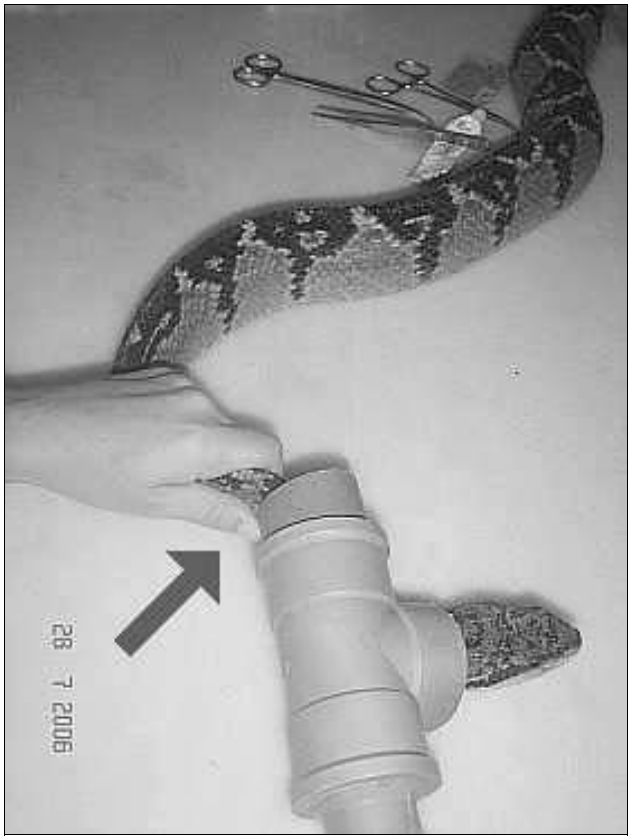
Up until a few months ago, we either used manual restraint or the transparent plastic tube technique. For simple actions such as tick removal, we used manual restraint. For longer procedures, such as the suture of wounds, we used the plastic tube, which often seemed "claustrophobic" and stressing to the animal.

The attempt to minimize this stress led us to this simple device, which leaves the animal at ease, even during time-consuming procedures, which could lead *Lachesis* to a deadly "shock state." We have never lost an animal even in 30-minute restrainings for suture of major cuts.

The device, which we call simply "T," is made with common PVC pipe and fittings and, since we have never seen these cheap plumbing items being used for these purposes, we would like to share it with fellow herpetologists.

The images speak for themselves. Notice the smaller diameter of the pipe in the opposite end of the T , which forces the snake to make a left (or right) turn. Notice also how the cervical area is free of any pressure and only a gentle grip further down the body is needed to hold the snake in place.

The most important aspect of the use of this device is the choice of the appropriate diameter, which must be made according to the animal you are working with. The diameter of the pipe should be similar (slightly larger) to the cross section of the head, which should fit "just right" with the T: not too



Materials: **(1)** a 2" or 3" T-joint; **(2)** a 2" or 3" × 1" coupling; **(3)** about 3' of 1" pipe for the handle; **(4)** PVC glue/cement.

tight, for the animal must go forward on its own, not loose to avoid the possibility of a sudden U-turn. Needless to say, the choice of diameter must be made by experienced handlers who should also place the animal in the device as follows.

Once the animal is imobilized the traditional way using the hands, introduce the head into the device and let go very slowly, offering the snake the possibility to go forward, gently controlling the grip pressure (see arrow in picture #2). As soon as the snake feels that going backwards is not possible, things happen naturally: the normal behavior is to bump the snout into the dead end, retreat a little, and go for the light and ventilation. Once it makes the turn, block the back and forth movement by a gentle increase in the grip pressure.

In our experience with bushmasters, the snake always makes the turn naturally, avoiding the claustrophobic dead end and following what appears to be its only escape route. It is also important to keep in mind that in the case of large bushmasters the operation may take three or four people: one handling the opposite end of the T, another controlling the T itself restraining/letting go the animal, another in the snake's midsection, controlling twisting attempts and finally, the fourth person doing whatever procedure is necessary, in the picture above, suturing a machete wound.

Once the animal is locked into the device, less experienced persons can handle the grip on the animal, which does not require any strengh at all, quite the contrary, specially with *Lachesis*, a gentle touch is a necessity. In pictures 2 and 4, my wife Ana is controlling the animal.

Finally, we would like to stress that our experience with the T is limited to *Lachesis muta* only. We believe, though, that the general principles and ideas described in this short communication should apply to other venomous snakes, with or without adaptations. We would like to hear your experiences with other species, relating eventual problems and/or improvements made to the device.

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Recent Herpetological Acquisitions from the Chínipas Region of Southwestern Chihuahua

Julio A. Lemos-Espinal[1], Hobart M. Smith[2] and David Chiszar[3]

Abstract

A brief, late summer 2006 visit to southwestern Chihuahua for amphibians and reptiles yielded 141 specimens of 28 species, including two species not before known to occur in the state: *Syrrhophus interorbitalis* and *Tropidodipsas repleta*. The collection is summarized.

The herpetological fauna of the state of Chihuahua is predominantly montane toward the west (in the Sierra Madre Occidental), or arid in the central and eastern parts (the Chihuahuan Desert). Our field work over the past decade has demonstrated, however, that in the southwestern corner of the state a tropical herpetofauna exists of major importance in the diversity represented in Chihuahua. Its rich fauna has escaped much attention mostly because of the small size of the tropical area and its considerable difficulty of access.

Aware of the considerably incomplete knowledge of this tropical area, despite his work there over the several past years, JLE briefly returned in late summer, 2006, to the vicinity of Chínipas, a headquarters in the past. We here report the results of that foray, including 141 specimens of 28 species. They include two species never before known from the state. It remains almost certain that others remain to be found.

Species List

Bufo marinus (Linnaeus). Six specimens (JLE 14607-8, 14610, 14612-3, 14615) are from the Río Chínipas, in Chínipas (27°23'39.9"N, 108°32'9.7", W) 469 m elevation. All are small, at 33–47 mm snout–vent length (SVL). It is noteworthy that at this size parotoid glands, which are quite large and V-shaped in adults, are not fully developed, particularly at the lower apex.

Bufo punctatus Baird and Girard. Four transformlings (JLE 14609, 14611, 14614, 14616) were collected along with the preceding specimens. All are 23–25 mm SVL, but even at that small size have perfectly formed, round parotoid glands.

Rana magnaocularis Frost and Bagnara. This species is represented by 15 specimens. Seven (JLE 14645-6, 14650-2, 14654-5) are from Laguna, and 8 (JLE 14669, 14670-6) from El Recodo. The largest is 54 mm SVL. All have the dorsolateral folds sharply displaced posteriorly.

Smilisca baudinii (Duméril and Bibron). Eight specimens (JLE 14617-8, 14630-5) are from El Recodo. Most are adults; the smallest is 41mm SVL.

Syrrhophus interorbitalis Langebartel and Shannon. A single specimen (JLE 14663) is from Cumbre del Caballo (27°22'22.4"N, 108°34'31.9"W) 1127 m elevation. This is the first specimen known from Chihuahua, and extends the known range of the species about 230 km north of northern central Sinaloa.

Kinosternon integrum (Le Conte). A single specimen (JLE 14679), 63 mm carapace length (straight line), is from Agua Salada (27°22'54.1"N, 108°28'8.6"W) 536 m elevation.

Anolis nebulosus (Wiegmann). Two specimens (JLE 14605-6) are from El Jordán (27°23'16.8"N, 108°32'40"W) 469 m elevation.

Aspidoscelis costata barrancarum (Zweifel). Thirty-two specimens (JLE 14555-84, 14666-7) are from Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation. Longitudinal lines are present in all. None resemble the large (111 mm SVL), brightly spotted and lined individual reported by Lemos-Espinal et al. (2004). It must be a rare variant.

Ctenosaura macrolopha Smith. Five specimens (JLE 14586-8, 14642-3) are from Chínipas. The largest male (JLE 14643) is 185 mm SVL.

Phyllodactylus tuberculosus saxatilis Dixon. Four (JLE 15596-9) were found at Iglesia Mesa del Rosario (27°22'48"N, 108°32'41"W) 469 m elevation.

Sceloporus albiventris Smith. Three young individuals (JLE 14593-5) are from El Limón (27°24'1"N, 108°32'36"W) 451 m elevation. One has four femoral pores on each side—an unusually large number for the species.

Sceloporus c. clarkii Baird and Girard. Three (JLE 14589-91) are from Ejido Las Borregas (27°23'4.3"N, 108°32'21"W) 470 m elevation. One adult male is almost uniform grayish tan above, even on the limbs. The dark bars on the limbs are only faintly evident.

Sceloporus nelsoni barrancarum Tanner and Robison. A single large adult male (JLE 14592), almost entirely black below, is from Arroyo Las Borregas (27°23'4.3"N, 108°32'21"W) 470 m elevation.

Urosaurus bicarinatus tuberculatus Schmidt. Seven specimens were obtained, five (JLE 14600-4) from Mesa El Rosario, one (JLE 14657) from Laguna Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, and one (JLE 14668) from La Pinta. All have single frontal scales; males lack any gular coloration except for black streaks and flecks.

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Crotalus basiliscus (Cope). A large specimen, partially soft (JLE 14662) is from Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation.

Drymarchon melanurus rubidus Smith. Two specimens (JLE 14636-7) were taken at Río Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, within the village limits.

Hypsiglena ochrorhyncha ochrophaea Cope. Two specimens (JLE 14629, 14678) are from Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation. Both have three well-defined longitudinal dark streaks on the neck.

Hypsiglena torquata (Günther). A single individual (JLE 14628) was taken in Chinipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, as were others of *H. ochrorhyncha*. It has a well-defined light area across the neck, without longitudinal dark streaks.

Leptotyphlops dugesii (Bocourt). Two examples were taken, one (JLE 14554) at Barrio de la Loma (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, the other (JLE 14585) at Mesa del Rosario.

Masticophis bilineatus Jan. Two (JLE 14620, 14639) are from Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation.

Masticophis mentovarius striolatus (Mertens). Two (JLE 14638, 14661) are from Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, one (JLE 14656) from Laguna-Chínipas.

Micruroides euryxanthus australis Zweifel and Norris. Three specimens, of which one (JLE 14537) is from El Limón, one (JLE 14538) from San Antonio, and one (JLE 14648) from Mesa del Rosario.

Pituophis d. deppei (Duméril). One large, dehydrated specimen (JLE 14677) is from Tecorahui. It has the typical two prefrontals and pattern of the subspecies. It is only the second specimen known from Chihuahua, and the first with a precise locality.

Procinura aemula Cope. Eighteen specimens of this species with its incredibly variable pattern were taken. Sixteen (JLE 14539-53, 14664) were found at Barrio de la Loma (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, and two (JLE 14658-60) at Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation. The present series does not notably extend the range of variation reported in Lemos-Espinal et al. (2004) or Smith et al. (2006).

Salvadora deserticola Schmidt. JLE 14618 is from Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, and has 9-9 supralabials, at least 2 small scales separating the posterior chinshields, and the lateral dark stripe is on the 4th scale row anteriorly, 3rd posteriorly.

Sympholis lippiens rectilimbus Hensley. JLE 14621 is from Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, and has the posterior margin of the black head cap continuous (not indented) and slightly convex.

Thamnophis cyrtopsis collaris (Jan). Twelve specimens were collected. JLE 14622-7, 14649 and 14665 were all taken in Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation, mostly in or near the river; JLE 14640-1 were found NW of Chínipas, near Cerro de los Vitachis (27°24'30.6"N, 108°28'38"W); and JLE 14647 was taken at Laguna-Chínipas (27°23'39.9"N, 108°32'9.7"W) 469 m elevation.

Tropidodipsas repleta Smith et al. A single, totally dehydrated DOR (JLE 14680) was found at km 36 on the autotrail Temoris-Chínipas, mpio Guazapares (27°19'30.1"N, 108°18'41.9"W) 1563 m elevation. It is the 2nd known specimen of the species, and the first known from Chihuahua.

Acknowledgments

We are greatly indebted to Martín Velducea Avendaño, who has helped in many ways with our work in the vicinity of Chínipas. Support for these studies was provided by the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO), under project EE009. Support of the sabbatical leave of JLE in the Department of Ecology and Evolutionary Biology at the University of Colorado in Boulder was kindly provided through its chairman, Dr. Jeffrey Minton.

Literature Cited

Lemos-Espinal, J. A., D. Chiszar and H. M. Smith. 2004. Variation in *Procinura aemula*, the file-tailed groundsnake of Mexico. Bull. Maryland Herp. Soc. 40:61-69.

Lemos-Espinal, J. A., D. Chiszar, H. M. Smith and G. Woolrich-Piña. 2004. Selected records of 2003 lizards from Chihuahua and Sonora, Mexico. Bull. Chicago Herp. Soc. 39(9):164-168.

Smith, H. M., J. A. Lemos-Espinal and D. Chiszar. 2006. *Procinura, Procinura aemula*. Cat. Amer. Amphib. Rept. 820.1-820.4.

Book Review: *A Field Guide to Amphibians and Reptiles in Arizona* by Thomas C. Brennan and Andrew T. Holycross. 2006. vi + 150 pp. Arizona Game and Fish Department, Phoenix, AZ. www.azgfd.gov/i_e/pubs/publications.shtml ISBN 0-917563-53-0. Softcover. $12.00 (postage & handling included)

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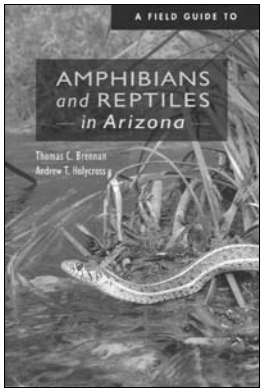


Arizona, surprisingly, has never had a major publication on its amphibians and reptiles, despite the diversity of species and the sizeable number of herpetologists residing in the state. True, a few publications have appeared over the years, other than articles in technical journals. The late patriarch of Arizona herpetology, Charles Lowe, prepared an annotated checklist of the state's species in 1964, but this publication lacked illustrations and range maps and is now long outdated. Fowlie (1965) published a book on the snakes of the state, with black-and-white photos and dot-locality maps, which has been long out of print. Twenty years ago, Lowe et al. (1986) produced an excellent illustrated guide to the venomous reptiles of the state, which is still a valuable reference. More recently, Brennan and Holycross (2005) published a small but excellent identification guide to the herpetofauna of Maricopa County, an area of central Arizona that includes the Phoenix metropolitan area. However, a comprehensive book on Arizona herpetology, complete with detailed species accounts, discussion of subspecies, dot-locality maps, and a thorough review of the state's herpetological literature, is still lacking.

That said, *A Field Guide to Amphibians and Reptiles of Arizona*, by Thomas Brennan and Andrew Holycross, goes a long way towards providing just such a reference for the state. Although not a comprehensive review in the same category as many other state herp books that have appeared in recent years, this publication fills a significant gap by providing both the herpetologist and amateur naturalist a professionally-done and compact guide to all 141 native and established (non-native) species in Arizona. Remarkably, Brennan and Holycross have managed to do this in a volume that easily fits in a backpack or vehicle glove box. The authors are to be commended for taking on this ambitious project and for producing such a fine reference. I would not be surprised if this guide serves as a starting point for the preparation of a much larger and more detailed book on Arizona herpetology in the coming years.

The guide includes an excellent introductory chapter, with color photographs, of the 14 recognized biotic communities in Arizona. The authors discuss the vegetation, topography, elevational ranges, and associated herpetofauna for each of these communities. A color map of the state is provided that shows the distribution of these communities. For the newcomer to Arizona, this is a valuable chapter for orientation purposes and illustrates the surprising diversity of habitats in the state.

The chapter on biotic communities is followed by the species accounts and photographs, which comprise the bulk of the guide. The introductions to each of the major taxonomic groups (salamanders, frogs and toads, turtles, lizards, and snakes) provide general information on the representatives found in Arizona and the families to which they belong. The species accounts are quite short (up to four per page) but filled with details on physical characteristics, behaviors, habitats, food habits, and reproductive aspects of each animal. The authors pack a remarkable amount of information into a fairly small space on each page. Species that are non-native, venomous, and/or protected in Arizona are clearly identified as such. For each species, the account and range map are provided side-by-side, and the accompanying photographs appear on the facing page, making this an extremely easy guide to use in the field. Subspecies are not discussed in the accounts, although some distinctive geographic races (such as the three forms of common kingsnake, *Lampropeltis getula*, in Arizona) are identified by their standard English name and illustrated where such information would be useful in identifying polymorphic species.

The color photographs of animals are uniformly excellent and are presented against a white background, with no "clutter" to interfere with their use in identifying a specimen in hand. Distinctive features of each species are indicated in the photos to further aid identification. In most cases, one photograph is provided per species, but where there are two or more distinct geographic forms or where juveniles have color patterns different from adults, multiple photos are provided. Most of the photos were taken by the authors, and a list of photo credits, including the location where each subject animal was collected, is provided at the back of the book. The book also includes a number of excellent line drawings (prepared by Randy Babb and the senior author) that show scale characteristics and other anatomical features useful in identification.

The range maps (one map per species) consist of a small base map of Arizona and its counties. The species distributions are portrayed with color shading and are based on museum records, the observations of the authors and other researchers, and availability of suitable habitat. Current ranges of native species are shown in green, whereas areas where a species is presumed extirpated are in yellow. Areas where a species has

been introduced and become established are shown in red. Although the maps are not detailed dot-locality maps, which are used in many geographic distribution studies and based on verified specimen records, they are carefully done and clearly identify areas where the distribution is not certain. For example, the range limits of the two Arizona species within the *Sceloporus undulatus* species complex (*S. tristichus* and *S. cowlesi*) are poorly known, and are therefore "faded out" to show our incomplete knowledge of distribution in these two recently recognized taxa.

The scientific and standard English names in the book are remarkably current. The names generally follow those proposed by Crother et al. (2000 [2001]; 2003), with a few exceptions based on more recent publications. Recent taxonomic changes that the authors have incorporated include the generic names *Smilisca* for *Pternohyla* (lowland burrowing treefrog) and *Craugaster* for *Eleutherodactylus* (barking frog), and the elevation of *Crotalus oreganus cerberus* (Arizona black rattlesnake) to full species status. *Rana subaquavocalis* (Ramsey Canyon Leopard frog) has been "sunk" into synonymy with *R. chiricahuensis* (Chiricahua leopard frog). In terms of English names, Arizona treefrog is used instead of mountain treefrog for *Hyla wrightorum*, the official state amphibian. The book even references two very recent (2006) papers on systematics and taxonomy, including one by Frost et al. that proposes some major name changes for amphibians. However, the authors point out that their book does not reflect these very recent revisions, which are still too new to have been fully evaluated by the herpetological community.

Brennan and Holycross provide a brief but useful discussion on how to avoid being bitten by a rattlesnake and, if avoidance fails, how to provide proper first aid if someone is envenomated. There is also a similar discussion of toad toxins and how to respond should your household pet be poisoned by the highly toxic Sonoran desert toad (*Bufo alvarius*), a herp-related hazard that most of us elsewhere in the U.S. probably have never considered.

The book also contains a glossary of technical terms, an index to English and scientific names, tips on viewing amphibians and reptiles in the field, and a handy checklist to Arizona species with space for writing field notes. There is no Literature Cited section, although several publications concerning taxonomy and the classification of biotic communities are cited in the text or as footnotes in the introductory pages.

In my opinion, anyone interested in herpetology should have a copy of this book, even if you have no plans to do any herping in the southwestern U.S. The high quality of the photographs and text and the low purchase price should be incentive enough for most readers of this review to pick up a copy. For those naturalists who frequent Arizona or adjacent states, this will be an immensely valuable guide. I thought I was reasonably familiar with the species of Arizona, but was pleasantly surprised at how much new information I learned while browsing through this book.

A Field Guide to Amphibians and Reptiles of Arizona, as well as its predecessor, *A Field Guide to Amphibians and Reptiles of Maricopa County* by the same authors, may be purchased by mail from the Arizona Game and Fish Department. Go to the Department's publications web page at http://www.azgfd.gov/i_e/pubs/publications.shtml to obtain the publication order form provided as a PDF. (Although the order form says to allow 4–6 weeks for mail delivery, I received my copy in less than a week.) Those readers who live in Arizona may purchase the book at any Game and Fish Department office. To my knowledge, it is not available in bookstores or via on-line booksellers.

Literature Cited

Brennan, T. C., and A. T. Holycross. 2005. A field guide to amphibians and reptiles of Maricopa County. Phoenix: Arizona Game and Fish Department.

Crother, B. I., J. Boundy, J. A. Campbell, K. de Queiroz, D. R. Frost, R. Highton, J. B. Iverson, P. A. Meylan, T. W. Reeder, M. E. Seidel, J. W. Sites, Jr., T. W. Taggart, S. G. Tilley and D. B. Wake. 2000 (2001). Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. Society for the Study of Amphibians and Reptiles, Herpetological Circular No. 29.

Crother, B. I., J. Boundy, J. A. Campbell, K. de Queiroz, D. Frost, D. M. Green, R. Highton, J. B. Iverson, R. W. McDiarmid, P. A. Meylan, T. W. Reeder, M. E. Seidel, J. W. Sites, Jr., S. G. Tilley and D. B. Wake. 2003. Scientific and standard English names of amphibians and reptiles of North America north of Mexico: Update. Herpetological Review 34:196-203.

Fowlie, J. A. 1965. The snakes of Arizona. Fallbrook, California: Azul Quinta Press.

Frost, D. R., T. Grant, J. Faivovich, R. H. Bain, A. Haas, C. F. B. Haddad, R. O. De Sa, A. Channing, M. Wilkinson, S. C. Donnellan, C. J. Raxworthy, J. A. Campbell, B. L. Blotto, P. Moler, R. C. Drewes, R. A. Nussbaum, J. D. Lynch, D. M. Green and W. C. Wheeler. 2006. The amphibian tree of life. Bulletin of the American Museum of Natural History 297:1-370.

Lowe, C. H. 1964. Amphibians and reptiles of Arizona. Pp. 153-174. *In*: C. H. Lowe, editor, The vertebrates of Arizona. Tucson: University of Arizona Press.

Lowe, C. H., C. R. Schwalbe and T. B. Johnson. 1986. The venomous reptiles of Arizona. Phoenix: Arizona Game and Fish Department.

Program Notes from the September CHS Meeting

by John Archer

I don't breed animals, especially not tortoises, and most especially not rare and endangered tortoises. I don't even own a tortoise. So why would a talk on breeding spider tortoises interest me? Because Dan Pearson's presentation was so much more than a simple how-to guide to breeding *Pyxis* spp., though he certainly covered that with enough detail to make me interested in trying. (Just interested. I'm too lazy to really attempt it.) While describing his methods for successfully breeding spiders, Dan managed to touch on import-export problems with endangered species, natural history, husbandry, genetic logs, and his meticulous solving of the problems of propagating Madagascan tortoises in Gainesville, Florida.

Our vice-president, Linda Malawy, introduced Dan, and I can't improve on it, so here is her introduction verbatim:

> Dan Pearson grew up in Jacksonville, Florida. His mother always told him that the woods were dangerous and snakes were evil, so he spent most of his time in the woods and chasing snakes. He finally realized that you could get paid for walking in the woods chasing animals and went off to college to become a zoologist. He received his Bachelors in Zoology at Duke University, and as if that wasn't bad enough, he went on to get a Masters in Zoology at the University of Florida. Having grown sick and tired of school, he was hired as a biologist with the Florida State Park system in Gainesville, Florida. He still lives in Gainesville with his wife, two kids, two dogs, three cats, a bird, two lizards, a few snakes, and more tortoises than you can shake a stick at. Good thing his wife is not only tolerant, but a veterinarian. And he still gets paid for walking in the woods, but he doesn't chase snakes anymore.

Spider tortoises in the broad sense (that is, tortoises of the genus *Pyxis*) comprise two species: *Pyxis arachnoides*, with three subspecies (*Pyxis a. arachnoides*, *P. a. oblonga* and *P. a. brygooi*), and *P. planicauda*, the flat-tailed tortoise. These forms cannot be told apart by looking at the carapaces, which are highly variable, but each has a characteristic plastron. Dan showed us maps and photos of the tortoises' ranges and habitats. All are found within thirty to fifty kilometers of the coast of southwestern Madagascar. *Pyxis arachnoides* inhabit savannah-like open dunes, while flat-tails prefer canopied areas. Both species are under pressure in the wild, with flat-tails under particular pressure from deforestation. Uncut patches of forest frequently surround the sacred grounds of graveyards, providing some of the last refuges for these tortoises. This results in the local name for them of "tomb tortoises" and endows them not only with some protected habitat, but also a taboo status that gives them added protection from human depredation. Deforestation is for charcoal production and cattle grazing, and the latter only accelerates the massive erosional problems caused by canopy removal over nutrient-poor tropical soils. Astronauts have commented that from space Madagascar appears to be bleeding to death because of the red soil washing into the sea. *Pyxis arachnoides* are not in as much danger of extirpation in the wild as the flat-tails, but development is encroaching upon their coastal range. Collecting for export was a major threat to all these turtles' survival in the wild at the beginning of the twenty-first century. Dan showed interesting and alarming discrepancies between export limits set by the Malagasy government during those years and actual exports. Export quotas set by the government seemed to mean little compared to the massive numbers actually exported. Fortunately, most exports have been banned.

Since the year 2000, Europeans have maintained a stud book on spider tortoises, and using data from that highly recommended source, Dan showed that while temperatures in native spider habitats in Madagascar vary only slightly from season to season, rainfall variance is dramatic. Shifting the data six months to compensate for Madagascar's southern hemisphere location, Gainesville's rainfall distribution closely matches Madagascar's patterns, including the occasional massive inundations from hurricanes. While summer temperature patterns match fairly closely between both localities, winters in north-central Florida are too cold to keep the tortoises outside, so during their inactive period, Dan's tortoises are kept inside in his favorite indoor tortoise pens, large Rubbermaid bins.

Dan went into great detail about husbandry of spiders, mostly stressing the interesting fact that the incubated eggs must go through a cooling period in order to hatch. Without a warm–cool–warm incubation the eggs will simply not develop. His slides of developing embryos were particularly interesting. While he almost made me want to try raising these fabulous looking little tortoises, Dan stressed that an animal that is essentially "a rock" for five months of the year is not everyone's favorite pet, and many zoos won't maintain these animals because they obviously don't display well all year long.

Dan held my interest throughout his presentation, and much of what he said would be dry if set to paper, but when he talked of the process of discovering the needs of these tortoises, how he researched and experimented with different care techniques, his sharing of his daily observations, and his detailed explanation of raising, breeding, and hatching these really cool animals, he constantly revealed his affection for all of the *Pyxis* species. Dan exemplified the best of what a private breeder can accomplish. He stressed the importance of becoming knowledgeable about the tortoises by using the Internet and literature, maintaining detailed records, being observant, registering with a stud book, and supporting organizations such as the Turtle Survival Alliance. Dan gave those of us who wish to breed threatened species of any type an excellent road map. And for all of us keeping herps of any kind, he inspired us to be part of the solution rather than part of the problem. Because of that, I think his presentation on "Keeping and Breeding the Malagasy Spider and Flat-tailed Tortoises, *Pyxis arachnoides* and *P. planicauda*" did much more than his title suggested. Thanks, Dan, for setting the standard high.

Herpetology 2006

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

REPRODUCTIVE BIOLOGY OF THE AMPHISBAENIA

D. V. Andrade et al. [2006, Amphibia–Reptilia 27(2):207-217] review the information currently available on the reproduction of the Amphisbaenia and provide original data on the reproductive biology of four Neotropical species: *Amphisbaena alba*; *A. mertensi*; *Cercolophia roberti* and *Leposternon infraorbitale*. In total, data were compiled for 22 species: 17 Amphisbaenidae, 1 Rhineuridae, 3 Bipedidae and 1 Trogonophidae. The majority of the species were oviparous with the exceptions of *Loveridgea ionidesii*, *Monopeltis anchietae*, *M. capensis* and *Trogonophis wiegmanni*. Viviparity was interpreted as a derived trait that evolved independently for at least 3 times within the Amphisbaenia. In most species, reproduction is synchronized with the hot and rainy season and seems to vary with latitude. Although Amphisbaenia eggs have been found in ant nests, it remains disputable whether this is an obligatory or even a preferable location for egg-laying. Incubation time in *A. mertensi* lasts 59 days and this is the first report encompassing egg-laying to hatching for any Amphisbaenia species. Nonetheless, a two-month incubation period seems to be the common rule for oviparous Amphisbaenia. The general pattern of reproductive output in Amphisbaenia is characterized by a low number of eggs/embryos per clutch whose individual size is comparatively large in relation to adult body size. Eggs are markedly elongated on the long axis and arranged in-line within the abdominal cavity possibly to prevent/diminish biomechanic drawbacks of egg bearing. Hatchlings of *A. mertensi* possess an egg-tooth implanted at the upper jaw, exhibit positive geotropism and display defensive behaviors known to be present in adults. This review shows that current knowledge of Amphisbaenia reproduction is fragmentary, often based on the examination of small samples, and heavily dependent on the publication of anecdotal observations. Future publications on this subject are encouraged.

SEASONAL MOVEMENTS OF BRAZILIAN TURTLES

A. Fachín-Terán et al. [2006, Chelonian Conservation and Biology 5(1):18-24] studied the linear home range and seasonal movements of *Podocnemis sextuberculata* from September 1996 to December 1998 in the Mamirauá Sustainable Development Reserve located in the middle Solimões River, near Tefé, Amazonas, Brazil. Data on turtle movements and home range were collected through mark and recapture and radiotelemetry, focusing on seasonal differences between periods of high and low water. Based on radiotelemetry of 6 females in the Jarauá River system, linear home range varied from 16.5 to 44.5 km. Nesting migrations from the Jarauá to the beaches of the Japurá River averaged 18.0 km. Males did not move significantly between captures. For conservation purposes, it is critically important to protect both the canals that the turtles use to travel between the lakes and the river as well as the deep holes in the river where mature turtles congregate during the dry season.

ARE MALE MINK FROGS TERRITORIAL?

C. R. Bevier et al. [2006, J. Herpetology 30(2):160-164] note that the mink frog, *Rana septentrionalis*, is closely related and behaviorally similar to the green frog, *Rana clamitans*, and the bullfrog, *Rana catesbeiana*, but has a much smaller geographical range and is not as well known. The authors used mark–recapture and observation techniques to estimate male chorus attendance and site fidelity during the breeding season. They captured, measured, and individually marked 139 males in 2002 and 85 males in 2003. Each male's initial and subsequent positions were recorded using a Global Positioning System. About half the males were never recaptured in either year. Most of the remaining males were recaptured only four times; two males were recaptured more than 10 times. Males were recaptured from subsequent positions as far apart as 90 m and as close as 0.6 m. Males recaptured on consecutive observation nights were in positions less than 15 m apart on average. Although aggressive calling, chasing, and fighting occur when males encounter each other, there is no evidence that male mink frogs defend territories over prolonged periods as in green frogs and bullfrogs.

PLICIDENTINE IN TEETH OF SQUAMATE REPTILES

M. Kearney and O. Rieppel [2006, Copeia 2006(3):337-350] note that despite its use as a diagnostic taxonomic feature, the occurrence and distribution of plicidentine in the teeth of squamate reptiles is unclear. This appears to be due to several factors: the various kinds of folding, wrinkling and striation that occur within different dental tissues; difficulty of interpreting conditions in poorly preserved extinct taxa; and incomplete knowledge of tooth development. The authors investigated tooth development and morphology in extant and fossil squamate reptiles using skeletal preparations, histological sections, and CT-scanning data. Among squamates, the authors found plicidentine only in the teeth of varanoid lizards and note that much more anatomical complexity exists than previously thought in the dental and attachment tissues of these groups. Degree of development of plicidentine is variable within varanoids, with the strongest development occurring in some species of *Varanus*. In contrast to some reports, no evidence was found for the occurrence of plicidentine in the teeth of mosasauroid lizards or snakes. Some mosasaurs exhibit raised ridges on the enamel surface that extend from the base to the tip of the tooth, as well as occasional striation of the tooth bases built from bone of attachment; neither of these features is considered homologous to plicidentine infolding. Some snakes exhibit weak wrinkling of the tooth base that corresponds closely to the pattern of wrinkling in the overlying bone of attachment. This condition occurs infrequently in snakes, and details of tooth development and attachment also do not support its homology with plicidentine. These results indicate that plicidentine is best interpreted as a synapomorphy of Varanoidea.

ECOLOGY OF INTRODUCED BULLFROGS

P. Govindarajulu et al. [2006, J. Herpetology 40(2):249-260] note that organisms can diverge in life history when introduced outside their native range due to release from predators, competitors, and parasites, and also due to genetic drift and local adaptation. The authors studied the ecology of the American bullfrog (*Rana catesbeiana*) in its introduced range in British Columbia (BC). To assess differences between introduced and native populations, the population ecology of BC bullfrogs was compared to published life-history parameters from the bullfrog's extensive native range in eastern North America. In BC, bullfrogs emerged from hibernation in late April and early May. Breeding choruses developed fully when air temperatures exceeded 20°C. Eggs were laid from mid-June to mid-July when the mean water temperature was 20°C. Mean egg mass size was 13,014 ± 7,296 eggs (mean ± standard deviation). Tadpoles hatched in 3 to 5 days and overwintered the first year as tadpoles. Approximately 68% of the tadpoles metamorphosed at the end of the following summer, but the remaining spent a second winter in the pond. Bullfrogs were large enough to attain sexual maturity 2 yr after metamorphosis. Bullfrog population density among ponds varied from 4.1 to 530 frogs/ha. Terrestrial insects were the primary prey item of bullfrogs < 150 g, whereas frogs were the primary prey item of larger bullfrogs. The life-history parameter values estimated for BC bullfrogs were within the range observed for bullfrogs in their native habitats. Due to milder weather conditions in southwestern BC, the seasonal pattern and growth rate of bullfrogs were similar to lower latitude populations in Kentucky and Missouri. No evidence was found to support the hypothesis that when released from native predators and parasites bullfrogs build up to unusually high population densities or attain significantly larger sizes in their introduced range.

BET HEDGING VERSUS PHENOTYPIC PLASTICITY

K. Thrumm and M. Mahony [2006, Amphibia–Reptilia 27(1): 11-18] report that field observations indicate that when faced with the desiccation of their ephemeral ponds, the tadpoles of *Pseudophryne australis* do not accelerate metamorphosis, and total reproductive losses are a frequent event. This experiment tested whether tadpoles were able to accelerate developmental rates when subjected to a decline in the water level. Tadpoles were divided into three treatments: water was held either at a constant level, or was removed at a slow or a fast rate. There were no significant differences in the mean length of larval duration in the three groups, and the distribution of ages at metamorphosis was asynchronous in all treatments. Metamorphosis first started at day 39 and continued in similar proportions up to day 57 in all treatments, after which a higher proportion of tadpoles from the desiccation treatments metamorphosed than in the constant deep-water group. This trend was reflected in statistically significant, but minor differences in developmental stage between treatments. These results suggest a combination of diversified bet-hedging and predictive plasticity. There was a significant positive relationship between age and weight at metamorphosis.

CHYTRIDIOMYCOSIS INDICATOR IN TADPOLES

R. A. Knapp and J. A. T. Morgan [2006, Copeia 2006(2): 188-197] state that chytridiomycosis is an emerging infectious disease of amphibians caused by the fungal pathogen *Batrachochytrium dendrobatidis*, and its role in causing population declines and species extinctions worldwide has created an urgent need for methods to detect it. Several reports indicate that in anurans chytridiomycosis can cause the depigmentation of tadpole mouthparts, but the accuracy of using depigmentation to determine disease status remains uncertain. The objective of this study was to determine for the mountain yellow-legged frog (*Rana muscosa*) whether visual inspections of the extent of tadpole mouthpart depigmentation could be used to accurately categorize individual tadpoles or *R. muscosa* populations as *B. dendrobatidis*-positive or -negative. This was accomplished by assessing the degree of mouthpart depigmentation in tadpoles of known disease status (based on PCR assays). The depigmentation of *R. muscosa* tadpole mouthparts was associated with the presence of *B. dendrobatidis*, and this association was particularly strong for upper jaw sheaths. Using a rule that classifies tadpoles with upper jaw sheaths that are 100% pigmented as uninfected and those with jaw sheaths that are < 100% pigmented as infected resulted in the infection status of 86% of the tadpoles being correctly classified. By applying this rule to jaw sheath pigmentation scores averaged across all tadpoles inspected per site, the authors were able to correctly categorize the infection status of 92% of the study populations. Similar research on additional anurans is critically needed to determine how broadly applicable these results for *R. muscosa* are to other species.

SEX DIFFERENCES IN SPOTTED TURTLE LONGEVITY

J. D. Litzgus [2006, Copeia 2006(2):281-288] notes that turtles are in decline worldwide, and few studies have collected the long-term, age-specific demographic data needed to identify species-specific life history stages critical to population viability and conservation. This study reports estimates of birth and death rates, survivorship, and longevity of spotted turtles *(Clemmys guttata*) using modified logarithmic decay equations and 24 years of mark-recapture data collected from a population at the northern extreme of the species' range. The recruitment rate was more than twice the mortality rate. Spotted turtle survivorship and longevity estimates are among the highest values reported for any animal species, and females are significantly more long-lived than males. Minimum annual adult female survivorship is 96.5%, maximum longevity is 110 years, and age at maturity is 12 years. Minimum male survivorship is 94.2%, maximum longevity is 65 years, and age at maturity is 11 years. This ongoing study is the longest-running on spotted turtles, yet insufficient age-specific data have been gathered to construct a life table, particularly because egg and hatchling survival rates remain unknown; future work should specifically focus on gathering such data. The results of the current study have important management implications when considering which life history stages to protect for maintenance of population viability of long-lived vertebrates.

MOVEMENTS OF MARBLED SALAMANDERS

C. L. Jenkins et al. [2006, J. Herpetology 40(2):240-248] note that most studies on orientation of movements of pond-breeding salamanders have considered only a single local population (or breeding pond) during multiple years, or multiple populations during a single year. The authors quantified migratory patterns of marbled salamanders, *Ambystoma opacum*, at nine breeding ponds during 5 yr in western Massachusetts. Based on captures at drift fences, movements were nonuniform at all breeding ponds. In addition, the direction of orientation differed among breeding ponds and changed slightly across years. Within ponds, orientation of adults and juveniles differed significantly in 52% of comparisons, and adult movements were more directionally concentrated than those of juveniles. In addition, migrating salamanders shifted slightly the orientation of their movements as they traveled into uplands, suggesting that migration routes are spatially complex and that determination of migration "corridors" based on concentrated captures at the pond periphery may be misleading. Although salamanders used migration routes with higher canopy cover, models did not explain a large portion of the variation in orientation, and protecting areas of high canopy cover alone may not be sufficient as a protection strategy. These results suggest that movement routes, though perhaps concentrated in the short term, are unpredictable in the long term. This study offers little evidence that distinct corridors can be identified and protected that would be used consistently over time by migrating or dispersing marbled salamanders. Consequently, at least until the mechanisms governing movements in this species are better understood, a conservative conservation strategy would require protecting broad terrestrial areas around breeding sites.

EFFECTS OF TEMPERATURE VARIATION ON EMBRYONIC TURTLES

M. A. Mullins and F. J. Janzen [2006, Herpetologica 62(1): 27-36] note that temperature is a crucial factor in the development of oviparous organisms. Under natural conditions, the eggs of many species are subjected to changing thermal environments, but most laboratory studies have incubated eggs at constant temperatures. To evaluate the phenotypic effects of different thermal means and variances and to separate temperature effects from maternal effects, eggs from 10 clutches of smooth softshell turtles (*Apalone mutica*) were equally distributed among six temperature treatments that reflect thermal conditions observed in natural nests: two eggs each at a mean of 28.5 or 32.5°C, with ranges of ± 0, 2 and 4°C. In addition to embryonic traits (change in egg mass, hatching success, and incubation length), body size, swimming performance, and righting time of the hatchlings were measured and evaluated. The interaction between mean temperature and temperature fluctuation exerted a significant influence on eight of the ten traits measured, indicating that fluctuating temperatures do not have equivalent phenotypic effects at different mean temperatures. Clutch of origin also was responsible for explaining a large fraction of the variation for nearly all of the traits. Altogether, these results suggest that clutch effects are pervasive and that thermal effects during embryonic development are complex and deserve further investigation.

URBANIZATION AND THE GARDEN SKINK

C. Prosser et al. [2006, J. Herpetology 30(2):151-159] note that there is a close link between the habitat of an organism and its behavior, performance and morphology. Many urban parks and gardens are modified such that the ground layer is more open and less complex than the ground layer of a natural bushland habitat. Garden skinks (*Lampropholis guichenoti*) are widespread and common throughout the Sydney, Australia, region in both modified and more natural habitats. Garden skinks might, therefore, exhibit differences in behavior, performance, and morphology between these two habitats. The authors studied behavior (habitat use and response to a predator), performance (sprint speed), and morphology of garden skinks in three modified urban garden habitats and three more natural bushland habitats. Lizards in modified habitats spent significantly more time on bare, flat surfaces farther from refuge than lizards in natural habitats. The distance to which an observer could approach a lizard before it fled (approach distance) was generally greater in modified habitats, and lizards in modified habitats had significantly faster sprint speeds than lizards in natural habitats. Lizard morphology (leg length) did not correlate with lizard performance. Apart from lizards at Modified Site 1 and Natural Site 1, lizards exhibited a similar, generalized body shape that was suited to various sprint speeds. However, the ability of garden skinks to exhibit different behaviors and performance levels (given similar body shapes) in structurally different habitats in part may explain why garden skinks are referred to as a successful "generalist" species.

EFFECTS OF UV ON SALAMANDERS

R. D. Calfee et al. [2006, J. Herpetology 40(1):35-42] note that increased ultraviolet-B (UV-B) radiation reaching the Earth's surface has been implicated in amphibian declines. Recent studies have shown that many amphibian species have differences in sensitivity depending on developmental stage. Embryos and larvae of *Ambystoma maculatum* (spotted salamander) and larvae of *Ambystoma talpoideum* (mole salamander) were exposed to five simulated UV-B treatments in controlled laboratory experiments to determine the relative sensitivity of different lifestages. Hatching success of the embryos exceeded 95% in all treatments; however, the larvae of both species exhibited greater sensitivity to UV-B exposure. Older larvae of *A. maculatum* that were not exposed to UV-B as embryos were more sensitive than larvae that had hatched during exposure to UV-B. Growth of surviving larvae of *A. maculatum* was significantly reduced as UV-B intensity increased, whereas growth of *A. talpoideum* was unaffected. These results were compared to ambient UV-B conditions in natural environments. It appears that the embryo stage is relatively unaffected by UV-B levels observed in natural habitats, probably because of protection from vegetation, organic matter in the water column, oviposition depth, and egg jelly. The larval stage of these species may be at greater risk, particularly if there is an increase in UV-B radiation exposure caused by increases in water clarity and/or decreases in dissolved organic carbon.

SPOTTED SALAMANDER MOVEMENTS

K. E. Montieth and P. W. C. Paton [2006, J. Herpetology 30(2):195-205] note that few studies have investigated the emigration behavior of adult ambystomatid salamanders in fragmented landscapes. These authors assessed the emigration behavior of 30 spotted salamanders (*Ambystoma maculatum*) by implanting transmitters in 2003. Study sites, all in southern Rhode Island, included an active golf course, a golf course under construction, and a closed-canopy forest that served as a control site. Maximum dispersal distances from breeding ponds ranged from 44 to 467 m (mean = 145, SE = 20 m), with the maximum distance twice as far as prior studies on this species. Spotted salamanders exhibited distinct preferences for terrestrial habitats by avoiding fairways and selecting forested uplands and forested wetlands. The use of forested wetlands was unusual because most past research has suggested avoidance of this habitat by spotted salamanders. The study documented adult spotted salamanders crossing fairways to adjacent forest patches; thus, fairways were not a dispersal barrier. Compared to random points, adult spotted salamanders selected cool microhabitats with greater leaf litter depth, more coarse woody debris, more canopy cover, less herbaceous cover, and high densities of vertical and horizontal small mammal burrows. These results suggest that maintaining extensive upland and wetland forested habitats near breeding ponds, with significant amounts of deep leaf litter, coarse woody debris, and high small mammal densities will help sustain spotted salamanders.

REPTILES AND GABON NATIONAL PARKS

O. S. G. Pauwels et al. [2006, Hamadryad 30(1&2):181-196] provide an overview of the current state-of-knowledge of herpetofaunal diversity in the recently-created Gabonese national park system. A provisional reptile list is currently available for only four of the 13 parks: Crystal Mountains, Loango, Lopé and Moukalaba-Doudou. Representation of endemic, near-endemic and legally-protected Gabonese reptiles in the parks is analyzed. Only one of the seven (near-)endemic species is recorded from a national park. Among nonpark sites, Mount Iboundji and the Rabi oil field (including Lake Divangui) are shown to be of high herpetological interest, enough to constitute adequate biodiversity sanctuaries. Enforcement and revision of protection laws, especially regarding sea turtles, softshell turtles and crocodiles, is urgently needed.

TURKISH FRESHWATER TURTLE SPECIES

D. Ayaz et al. [2006, Chelonian Conservation and Biology 5(1):10-17] compared two Turkish populations of *Mauremys caspica* and *Mauremys rivulata* morphologically, serologically and ecologically. Morphometric differences were noted among sexes and populations. Electrophoretic patterns demonstrated significant differences between the taxa and support their status as distinct species.

EFFICACY OF VISUAL ENCOUNTER SURVEYS

W. D. Flint and R. N. Harris [2005, J. Herpetology 39(4): 578-584] note that effective monitoring of population size is critically important for endemic species with specialized habitat requirements so that timely remedial steps can be taken when declines are detected. The authors initiated a monitoring study of the endemic Cow Knob salamander, *Plethodon punctatus*, which is generally found in talus habitats over 1000 m in elevation in a narrow range on Shenandoah Mountain on the border of Virginia and West Virginia. They tested congruence of nighttime visual encounter surveys (VES) and mark-recapture estimates of population size. VES was a valid index of the abundances of *P. punctatus* in the two habitats surveyed. Sites on the eastern and western sides of Shenandoah Mountain were surveyed, and both methods estimated that population size on the west was approximately twice as high as that on the east. Individuals of this species exhibited a high degree of site fidelity. Cover object searches for species in talus habitats are expected to be of limited value, leading to the conclusion that nighttime visual encounter surveys are most effective for population size monitoring of *P. punctatus* and other species that live in talus.

WATERSNAKE MOVEMENTS AND HOME RANGES

T. C. Roth II and B. D. Greene [2006, Copeia 2006(3): 544-551] note that the factors that influence spatial use and movement patterns in ectotherms may have important fitness consequences. To examine the effects of sex and condition on spatial use, the authors used radio telemetry to observe the movement of 18 adult *Nerodia sipedon* in a southwest Missouri lake. Snakes generally remained in close proximity (< 5 m) to aquatic habitats throughout the summer. Home range size estimates differed according to calculation method. Monthly total home range sizes peaked in mid-summer, possibly in response to increased amounts of vegetative cover, although core area sizes were consistent across the season. Contrary to previous studies of snakes, mean movement rates and home range sizes of male and gravid female *N. sipedon* were statistically indistinguishable and highly variable. Body size and condition influenced spatial characteristics of females, but only appeared to influence movement frequency of males. When compared to other populations, this population of *N. sipedon* tended to occupy similarly-sized shifting core areas associated with aquatic vegetation. Future studies should focus on the measurement of resource distribution to further understand the factors influencing variation in snake movements and spatial patterns.

Unofficial Minutes of the CHS Board Meeting, September 15, 2006

Rich Crowley called the meeting to order at 7:50 P.M. Board members Betsy Davis and Marybeth Trilling were absent.

Officers' Reports

Recording Secretary: Kira Geselowitz read the minutes that she had taken for the recording secretary at the August board meeting. The minutes were accepted as read.

Treasurer: Andy Malawy distributed the August financial reports.

Membership Secretary: Deb Krohn distributed the August 2006 membership report, showing 560 members..

Corresponding Secretary: Cindy Rampacek reported that she has been working on the CHS Yahoo! discussion group.

Publications Secretary: Eric Williams reported that he is continuing work on a forum and discussed the progress of the format. Erik will continue to work on the design.

Sergeant-at-arms: Linda Malawy reported for Betsy that attendance at the August meeting was 49.

Committee Reports

Shows: Rich Crowley reported that he spoke to Brian Potter and CHS will be having a booth at the NARBC in Tinley Park again this year, October 7–8.

Nominating Committee: So far Mike Dloogatch, Jenny Vollman, Kira Geselowitz and Jason Hood have been appointed.

Old Business

Scavenger hunt: Rich Crowley discussed doing an educational scavenger hunt with the sought-after items at various local nature centers. Jason Hood mentioned promoting ReptileFest at the different nature centers by advertising with them. Jason and Kira will be speaking with the nature centers about the membership visiting.

New Business

Steve Irwin: The board discussed supporting or recognizing Steve's work by sending a monetary donation to Conservation Wildlife Warriors on behalf of the CHS. Cindy Rampacek moved to send $100.00 on behalf of the CHS to Wildlife Warriors in memory of Steve Irwin. Mike Scott seconded the motion. Motion passed with all board members present in favor.

Roundtable

Mike Dloogatch reported that he attended the Midwest PARC (Partners in Amphibian and Reptile Conservation) meeting in Carbondale. This organization embraces amateur and professional herpetologists alike.

Deb Krohn mentioned that a fox snake was brought into the nature center by a police officer who thought that it was a venomous snake. The snake was brought in a trash can and was striking at it from within. Deb said that was the angriest fox snake she had ever met.

The meeting was adjourned at 10:05 P.M.

Respectfully submitted by Zorina Banas, Recording Secretary

Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, $.17 each; fuzzies, $.24 each; hoppers, $.30 each; weanling, $.42; adult, $.48. Rats: starting with pinks at $.45 each, to XL at $1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. PO Box 85, Alpine TX 79831. Call **toll-free** at (800) 720-0076 or visit our website: < http://www.themousefactory.com> .

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice availabe: small newborn pinks up to jumbo adults. Prices start at $25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: books. *Australian Tropical Rain Forest Life* by Clifford and Dawn Frith, 1987, 70 pp., one or two excellent color photos on almost every page, North Queensland mammals, birds, reptiles and amphibians (14 pp.), insects and plants, as new cond., softbound, $14; *The British Amphibians and Reptiles* by Malcolm Smith,1973 (5th ed.), 322 pp., 91 figs., 16 color and 16 b&w plates, very comprehensive and authoritative treatment, as new cond., hardbound, $25; *Seals of the World* by Judith King; 1983 (2nd ed.), 240 pp., color and b&w photos, figs., as new cond., hardbound, $15; *Portraits in the Wild—Animal Behavior in East Africa* by Cynthia Moss, 1982 (2nd ed.), 371 pp., b&w photos, inscribed by author in Nairobi in l988, excellent cond., softbound, $14. Postage and handling $2.50 for orders under $25, free for orders of $25 or more. William R. Turner, 7395 S Downing Circle W, Littleton, CO 80122, (303) 795-5128, e-mail: toursbyturner@aol.com.

For sale: 1.1 spider tortoises, *Pyxis a. arachnoides*, $600/pr.; 1.0.1 pancake tortoises, *Malacochersus tornieri*, both hatched last year, $300/ea. Please call Clarence at (918) 357-3215 before 9 P.M. Central time. Or e-mail: wrightotterman@msn.com.

Herp tours: Adventure trips to **Madagascar**! Journey somewhere truly unique to seek and photograph nature on the world's least-studied mini-continent. For maximum herp fun and discovery, join Bill Love as we go where few people will ever venture in their lives. Let his experience assure a comfortable tour finding the most colorful and bizarre species on the planet! Get all the details at Blue Chameleon Ventures' comprehensive new website: < http://www.bluechameleon.org> , E-mail: bill@bluechameleon.org, or call (239) 728-2390.

Herp tours: The beautiful Amazon! Costa Rica from Atlantic to Pacific! Esquinas Rainforest Lodge, the Osa Peninsula, Santa Rosa National Park, and a host of other great places to find herps and relax. Remember, you get what you pay for, so go with the best! GreenTracks, Inc. offers the finest from wildlife tours to adventure travel, led by internationally acclaimed herpers and naturalists. Visit our website < http://www.greentracks.com> or call (800) 892-1035, e-mail: info@greentracks.com

Virtual Museum of Natural History at www.curator.org: Free quality information on animals—emphasis on herps—plus expedition reports, book reviews and links to solid information. Always open, always free.

Wanted: I'm looking for my soulmate. I want to settle down to a family before it is too late. But I have this problem. . . . When we get into hobbies and interests: old popular records, jazz and show tunes, and antique electronics are fine, but when I mention turtles, "What, are you crazy?" So maybe this is a better place to look. Please don't try to separate me from my turtles—at least not most of them. If interested, please drop a line to Ellis Jones, 1000 Dell, Northbrook IL 60062, telling a bit about yourself and giving a phone number.

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com

News and Announcements

2007 CHS HERPETOLOGICAL GRANTS PROGRAM

The Chicago Herpetological Society announces the 2007 CHS Herpetological Grants Program to award financial support for herpetological research, education and conservation. Several awards of up to $500 each will be available. Interested parties may apply for a grant in any one of the following categories:

1. Illinois Herpetology
2. Graduate Student Research in Herpetology
3. Undergraduate Research in Herpetology
4. Conservation
5. Captive Management, Husbandry, and Propagation

An attempt will be made to award grants in each category, but depending on the applications received, not all categories may receive awards. Some categories may receive more than one award. The CHS Grants Committee reserves the right to reassign the category under which a given proposal is submitted.

To qualify for a grant, the applicant must be a member of the Chicago Herpetological Society as of December 31, 2006. In accepting a grant, the recipient agrees to abide by all state and federal laws, and to acknowledge the Chicago Herpetological Society in any publications or public presentations (e.g., posters, papers at symposia, etc.) that result from the subsidized research. Recipients should inform the CHS Grants Committee when their funded projects are completed, and will be encouraged to submit their work as an article for the CHS *Bulletin*, or will be invited to present a program at a CHS general meeting.

Proposals should include the following:

1. Statement of the objectives of the proposal, and a statement assigning the proposal to one of the five categories listed above.
2. Description of materials and methods.
3. Complete budget, not to exceed $500.
4. Brief résumé of the applicant, if an individual. If the applicant is an organization, background information on that organization should be included.
5. Letters of support from collaborating partners or institutions are encouraged; student applicants must include a letter of support from a faculty adviser (see further instruction below).
6. Anticipated completion date for the project.

Proposals may be submitted either by postal mail at the address below or as E-mail attachments. Letter(s) of support sent by postal mail should be included with the other application materials but in a separate, smaller sealed envelope. Letters of support may be E-mailed, but then should include a postal address and phone number at which the writer can be contacted. Proposals must include the applicant's name and address on the first page. Proposals should be typed using a common font (e.g., Arial, Times, Courier) no smaller than 10pt, and should be double-spaced. When submitting proposals by mail, send two copies of the entire package (i.e., including résumé, budget, letters of support, etc.) in the same envelope. Applications should be brief and simple. Avoid inclusion of color images or large tables unless absolutely necessary. Complete proposal packages should not exceed five double-spaced pages (excluding literature citations, applicant's résumé and letter[s] of support). Applications must be received by 31 December 2006, and awards will be announced by 15 February 2007.

Submit paper applications to:

Chicago Herpetological Society
Grants Program
2430 North Cannon Drive
Chicago IL 60614

Electronic submissions should be E-mailed to: CHSGrants@aol.com. [Please note slightly different email this year.]

Questions should be directed to Deb Krohn, (815) 462-3299, or CHSGrants@aol.com.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, October 25, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Marty Crump**, adjunct professor of biology at Northern Arizona University will speak to us about "Amazing Frogs: Appearance, Behavior and Lifestyle."

The November 29 meeting will include the annual election of officers and members-at-large of the CHS Board of Directors.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum — the **Peggy Notebaert Nature Museum**. This beautiful new building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the November 17 board meeting, to be held at the North Park Village Administration Building, 5801 North Pulaski Road, Chicago. To get there take the Edens Expressway, I-94, and exit at Peterson eastbound. Go a mile east to Pulaski, turn right and go south to the first traffic light. Turn left at the light into the North Park Village complex. At the entrance is a stop sign and a guardhouse. When you come to a second stop sign, the administration building is the large building ahead and to your left. There is a free parking lot to the left and behind the building.

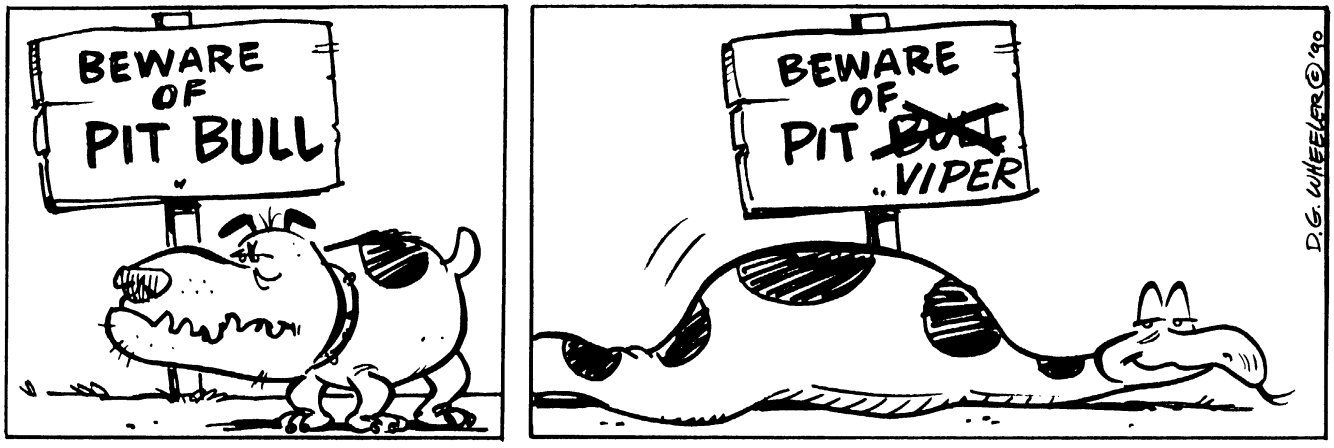
The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info call Lisa Koester, (773) 508-0034, or visit the CTC website: http://www.geocities.com/~chicagoturtle.

THANK-YOU

The Chicago Herpetological Society owes a big thank-you to Rob Carmichael and his staff at the Wildlife Discovery Center at Elawa Farms for rolling out the red carpet for our CHS Field Trip. After a lovely breakfast, we were let out of our cages for a while for some great free roam time, after which we were treated to a very nice slide presentation. Rob and his staff made the day wonderful for all involved.

THE ADVENTURES OF SPOT



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