BULLETIN
of the
Chicago Herpetological Society

Volume 52, Number 6
June 2017

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Cover: *Dipsadoboa viridis*, typical defensive posture, Mwagna National Park, Gabon. Photograph by Christopher Orbell.

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The *Bulletin of the Chicago Herpetological Society* (ISSN 0009-3564) is published monthly by the Chicago Herpetological Society, 2430 N. Cannon Drive, Chicago IL 60614. Periodicals postage paid at Chicago IL. **Postmaster:** Send address changes to: Chicago Herpetological Society, Membership Secretary, 2430 N. Cannon Drive, Chicago IL 60614.

Miscellanea Herpetologica Gabonica IX

Olivier S. G. Pauwels [1], Piero Carlino [2], Laurent Chirio [3], Quentin Meunier [4], Joseph Vivien Okouyi Okouyi [5], Christopher Orbell [6], Dominique Rousseaux [7] and Olivier Testa [8]

Abstract

We present new Gabonese locality records for *Gerrhosaurus nigrolineatus* (Gerrhosauridae), *Trachylepis maculilabris* (Scincidae), *Varanus ornatus* (Varanidae), *Calabaria reinhardtii* (Boidae), *Dipsadoboa viridis*, *Toxicodryas blandingii* (Colubridae), *Naja melanoleuca* and *N. nigricollis* (Elapidae), *Python sebae* (Pythonidae), *Atheris squamigera* (orange morph), *Bitis arietans*, *B. gabonica* and *B. nasicornis* (Viperidae). We add two, one, two and one species to Moyen-Ogooué, Ngounié, Nyanga and Woleu-Ntem provinces' reptile lists, respectively. We newly record two, one and one snake species for Mwagna National Park, Waka National Park and Bas Ogooué Ramsar Site, respectively. We report predation cases by a *Naja melanoleuca* on a *Toxicodryas blandingii* and by a Seba's python on a domestic dog (Mammalia: Canidae: *Canis lupus familiaris*), respectively.

Keywords

Biodiversity, herpetofauna, herpetology, Squamata, viper, cobra, dog, cave, protected areas, conservation, Ramsar, Gabon, Equatorial Africa

Introduction

Initiated in 2008, the series *Miscellanea Herpetologica Gabonica* is a forum created in order to gather various new data on the zoogeography and the natural history of the reptiles of Gabon (Pauwels and David, 2008; Pauwels, Chirio et al., 2017), to complete the information presented in the synthesis published by Pauwels and Vande weghe (2008). The current volume includes data collected during field work performed by the teams of Gabon's National Parks Agency (ANPN), the oil company Shell Gabon, and in the course of environmental surveys for the agro-industrial company SIAT Gabon and the mining company COMILOG.

Material and Methods

New photographic material was identified based on the keys provided by Pauwels and Vande weghe (2008). Abbreviations: Dept = Department; NP = National Park; Prov. = Province.

Results

Squamata

Gerrhosauridae

Gerrhosaurus nigrolineatus Hallowell, 1857

On 11 Oct. 2013 one of us (LC) observed an individual in Angondjé (0.53384 N, 9.39834 E), Libreville, Estuaire Prov. (Figure 1). It was in a cultivated field along a highly degraded secondary forest. New locality record. On 13 Feb. 2016 one of us (QM) photographed an adult individual in Nyonié, Komo-Océan Dept, Estuaire Prov. (Figure 2). The species is locally very common in Nyonié (J. P. Vande weghe, pers. comm. to OSGP, Feb. 2017). New locality record. Within the same dept, the Gabon plated lizard was already known from Pongara NP (Pauwels and Vande weghe, 2008: Fig. 102). On 26 Feb. 2017 LC observed a dead-on-road individual on the "colline de Tchad" (Tchad hill;

Figure 1. Live adult *Gerrhosaurus nigrolineatus* in Angondjé, Estuaire Prov., Gabon. Photograph by L. Chirio..

Figure 2. Live adult *Gerrhosaurus nigrolineatus* in Nyonié, Estuaire Prov., Gabon. Photograph by Q. Meunier.

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Figure 3. Adult *Trachylepis maculilabris* in Bitam, Woleu-Ntem Prov., northern Gabon. Photograph by L. Chirio.

Figure 4. Adult *Trachylepis maculilabris* in Mitzic, Woleu-Ntem Prov., northern Gabon. Photograph by L. Chirio.

0.96988°S, 10.48519°E), where the N1 road crosses a secondary forest, Tsamba-Magotsi Dept, Ngounié Prov. Secondary forest is an unusual place to find this savanna-dwelling species, but it is possible that, like *Agama picticauda*, it utilizes roads to colonize new areas (Pauwels and Vande weghe, 2011). New prov. record (Pauwels and Vande weghe, 2008).

Scincidae
Trachylepis maculilabris (Gray, 1845)
One of us (LC) observed the species in the SIAT camp of Bitam, Ntem Dept, on 21 July 2013 (Figure 3) and in the SIAT camp of Mitzic, Okano Dept, on 21 Feb. 2014 (Figure 4), Woleu-Ntem Prov. The photographs illustrate the possession of five to seven keels on most dorsal scales. New prov. record. In Gabon this species had previously been recorded only from Haut-Ogooué, Ogooué-Ivindo and Ogooué-Maritime provinces (Pauwels and Vande weghe, 2008; Pauwels, Le Garff et al., 2016). It is expected to occur also in the savanna areas of Nyanga Prov., where the savanna-dwellers *Naja nigricollis* and *Bitis arietans* were recorded (see their respective accounts below).

Varanidae
Varanus ornatus (Daudin, 1803)
See the account for *Python sebae* below and Figure 8, mentioning the use of the fat of the ornate monitor in Mbouda, Nyanga Prov., for traditional Punu medicine. The latter locality represents a new dept record (Pauwels and Vande weghe, 2008). Dewynter et al. (2017) reported (under *V. niloticus*) an individual killed for food consumption in Bikourou village, thus in Tsamba-Magotsi Dept, Ngounié Prov.

Boidae
Calabaria reinhardtii (Schlegel, 1851)
On 24 Nov. 2012 at 16:30 one of us (PC) encountered an adult individual under a log in dense forest near Boussimbi, Offoué-Onoy Dept, Ogooué-Lolo Prov. New locality record. The closest locality, Makandé, was mentioned by Blanc and Frétey (2000), and is located about 50 km to the north.

Colubridae
Dipsadoboa viridis (Peters, 1869)
On 28 Aug. 2015 at 12:21 in a forested floodplain (0°24'27.1"N, 13°39'05.8"E) in the buffer zone of Mwagna NP, one of us (CO) observed an individual exhibiting the typical defensive display for the species (Pauwels and Vande weghe, 2008), i.e., forming a spiral with the body and staying immobile like a small green vine (Figure 5 and cover). The photograph shows the uniform green color with small sky-blue apical spots on dorsal scales and the 17 smooth dorsal scale rows. New record for the NP (Christy et al., 2008; Vande weghe et al., 2016).

Toxicodryas blandingii (Hallowell, 1844)
See under *Naja melanoleuca*.

Elapidae
Naja melanoleuca Hallowell, 1857
On 20 March 2017 in a house garden in Yenzi, Gamba, Ogooué-Maritime Prov., an adult individual was disturbed by one of us

Figure 5. Adult *Dipsadoboa viridis* in the buffer zone of Mwagna National Park, showing the typical spiral-shaped defensive display of the species. Photograph by C. Orbell.

Figure 6. Adult *Naja melanoleuca* with a dead adult female *Toxicodryas blandingii* it regurgitated near Gamba, Ogooué-Maritime Prov., southwestern Gabon. Photograph by D. Rousseaux.

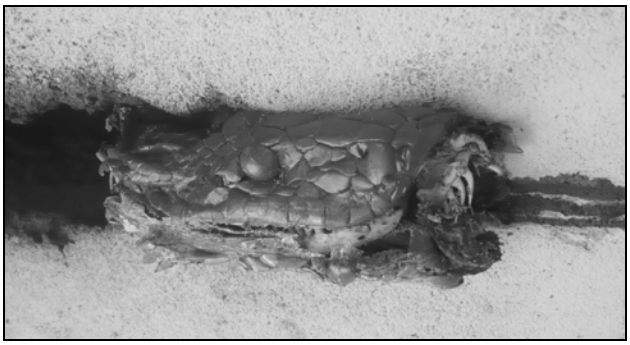

Figure 7. Head of a *Python sebae* kept for traditional use in Mbouda, Nyanga Prov., southwestern Gabon. Photograph by O. S. G. Pauwels.

(DR) while it had already swallowed 90% of an adult female *Toxicodryas blandingii*. The prey, of a length comparable to that of its predator (see Figure 6), was regurgitated by the cobra. This represents a new prey record for the black and white cobra, known to have a very eclectic diet (Pauwels and Vande weghe, 2008).

Naja nigricollis Reinhardt, 1843
In July 2016 one of us (LC) observed an adult individual crossing the L. 116 road at the level of Douki River, about 50 km SE of Tchibanga, Mougoutsi Dept, Nyanga Prov. Although it could not be caught, its typical *Naja* habitus, totally black head and neck, and dark gray back leave no doubt about its identification. New prov. record (Pauwels and Vande weghe, 2008). The presence of this savanna species in Nyanga savannas was expected, as was the presence of *Bitis arietans*, confirmed in 2012 (see below).

Pythonidae
Python sebae (Gmelin, 1789)
In an environmental report on Moulili River below Moanda in Lébombi-Léyou Dept, Haut-Ogooué Prov., made for the mining company COMILOG, Nguéma Nguéma et al. (2014) presented a photograph of a snake identified as a python caught by a fishing net in Moulili River between "pont SETRAG" (SETRAG bridge) and the point where it flows into Ogooué River. Although the photograph of the snake entangled in the net is taken from a distance, the stout habitus and the head and dorsal color pattern are typical of a young *Python sebae*. The species had not been previously reported from this dept. The same report by Nguéma Nguéma et al. (2014: 20) listed *Python regius* (Shaw, 1802) from the same locality, but without any supporting evidence; this record is certainly erroneous and the royal python is not present in Gabon (Auliya, 2008). Dewynter et al. (2017)

Figure 8. Jars containing fat of *Python sebae* and *Varanus ornatus* used for traditional medicine in Mbouda, Nyanga Prov., southwestern Gabon. Photograph by O. S. G. Pauwels.

provided photographs of a young individual found in a ditch along a path near a lake in forest, between Bikourou and Bemboudié. This observation thus took place in Tsamba-Magotsi Dept, Ngounié Prov. In August 2008 one of us (OSGP) photographed the head of an adult individual kept for traditional use in Mbouda (= Bouda), Basse-Banio Dept, Nyanga Prov. (Figure 7). In the same locality in July 2009, OSGP examined glass jars containing fat of python and *Varanus ornatus* used for traditional medicine by members of the Punu ethnic group (Figure 8). According to Mbouda's village chief, these adult pythons were killed in the direct surroundings of the village along Cachimba lake. New dept record. Within Nyanga Prov., the species had been recorded previously only from Haute-Banio and Mougoutsi Depts (Pauwels, Chirio et al., 2017). Python fat and snake heads are commonly used in Gabon for traditional medicine and magic (Pauwels et al., 2002b; Bonhomme, 2006: 88). Consumption of pythons in Gabon is a very ancient habit, as remains dating back from the Early Iron Age, c. 1,700 B.P., have been reported from a site in Oveng, at 12 km NE of Libreville (Van Neer and Clist, 1991, a reference overlooked by Pauwels and Vande weghe, 2008). On 19 Sept. 2014 one of us (CO) encountered an adult individual basking on a lateritic road in a secondary forest (0°12'30.1"S, 12°26'58.8"E) in Lopé Dept, Ogooué-Ivindo Prov., in the southwestern extremity of Ivindo NP (Figure 9). This new locality represents the southernmost record of the species within the park, in a poorly explored area (Carlino and Pauwels, 2015). In March 2011, one

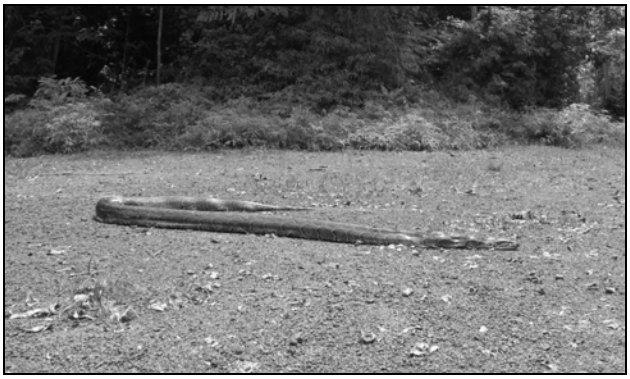

Figure 9. Adult *Python sebae* crossing a road in Ivindo National Park, central Gabon. Photograph by C. Orbell.

Figure 10. An orange *Atheris squamigera* in southern Ivindo National Park. Photograph by J. V. Okouyi Okouyi.

Figure 11. *Bitis arietans* in a savanna near Mabanda in Nyanga Prov., southwestern Gabon. Note the efficient camouflage. Photograph by C. Orbell.

of us (DR) was called at night to assist P. Ngalamou, gardener in Yenzi, Gamba, Ogooué-Maritime Prov., whose dog (Mammalia: Canidae: *Canis lupus familiaris* Linnaeus, 1758) had been killed and eaten by a large python in his vegetable plantation. The adult dog was chained when it was attacked, and the python, after having swallowed it, was stuck because the dog's metallic chain was still attached to a wooden pole. When disturbed, the python regurgitated the dead dog. Schweitzer (1950) reported predation cases by pythons on a dog, goats and chickens in Lambaréné, Moyen-Ogooué Prov.

Viperidae

Atheris squamigera (Hallowell, 1856)

In June 2012 one of us (JVOO) photographed a uniformly orange individual in Langoué (00°10.029'S, 12°30.139'E), in the southern part of Ivindo NP, Lopé Dept, Ogooué-Ivindo Prov. (Figure 10). In March 2013 JVOO observed another orange individual near Ipassa in Ivindo Dept, Ogooué-Ivindo Prov., in the northern part of Ivindo NP. The orange morph of this viper was recorded for the first time in Gabon by Pauwels, Le Garff et al. (2016) based on an individual from Mondah Forest in Estuaire Prov. Prior to the current report only the green morph had been recorded from Ivindo NP, where it is common (Carlino and Pauwels, 2015; Vande weghe et al., 2016: Fig. 944). Orange morphs probably exist throughout the country, but are obviously much rarer than the green morph.

Bitis arietans (Merrem, 1820)

On 3 Dec. 2016 one of us (CO), while cutting grass in a savanna between Mabanda and the Congolese border to give more visibility to a camera trap designed to photograph wildlife, accidentally injured a Puff Adder with a machete (Figure 11). This locality is situated in Doutsila Dept, Nyanga Prov. New dept record. This savanna species is localized in Gabon, and had been recorded to date only near Moukalaba-Doudou NP in the villages of Mourindi and Loango, Nyanga Prov. (Pauwels et al., 2012) and in Djouori-Agnili and Passa Depts in Haut-Ogooué Prov. (Pauwels and Sallé, 2009).

Figure 12. Live *Bitis gabonica* in Mbera cave, Ogooué-Lolo Prov., Gabon. Photograph by O. Testa.

Bitis gabonica (Duméril, Bibron & Duméril, 1854)

One of us (Testa, 2015) reported an unvouchered observation in mid-2015 of a dead individual in Gouffre de Limbenga (Limbenga chasm), alt. 407 m asl, Mouloundou Dept, Ogooué-Lolo Prov. In the same dept, OT also photographed (Figure 12) a live individual in Mbera cave (Grotte de Mbera; 0°54'49.3"S, 12°50'21.2"E, see Oslisly and Testa, 2016). First dept records (Pauwels et al., 2002a; Pauwels and Vande weghe, 2008). On 11 Aug. 2014, i.e. in the dry season, at 15:02, CO encountered an adult individual along an abandoned logging road (1°08'07.7"S, 11°07'50.6"E) in Waka NP (Figure 13). The presence of the viper had been betrayed by the alarm call of birds, motivating the search for the snake. CO photographed another adult further south in the park (1°09'11.9"S, 11°07'14.1"E), on an abandoned logging road. First records for the park. Including this new record, only two reptile and two amphibian species are currently recorded from Waka NP (Pauwels, Le Garff et al., 2016; Pauwels, De Bakker et al., 2017; Vande weghe et al., 2016). On the morning of 15 May 2012, one of us (LC) observed one individual crossing the road near Mabounié, 40 km ESE of Lambaréné, Ogooué & Lacs Dept, Moyen-Ogooué Prov. New prov. record and new record for the Bas Ogooué Ramsar Site (Pauwels and Vande weghe, 2008; Vande weghe et al., 2016). LC examined a dead individual kept for food consumption in a freezer in Bitam, Ntem Dept, Woleu-Ntem Prov. It had been killed on 21 July 2013 in the nearby SIAT hevea plantation.

Figure 13. Adult *Bitis gabonica* in Waka National Park, Ngounié Prov., Gabon. Photograph by C. Orbell.

Figure 14. Young *Bitis gabonica* near Makabana, Nyanga Prov., southwestern Gabon. Photograph by L. Chirio.

Figure 15. Adult *Bitis nasicornis* crossing a road near Mbomo, Ogooué-Ivindo Prov., northeastern Gabon. Photograph by C. Orbell.

Figure 16. Adult *Bitis nasicornis* in the southern buffer zone of Mwagna National Park, Ogooué-Ivindo Prov., northeastern Gabon. Photograph by C. Orbell.

New dept record (Pauwels and Vande weghe, 2008). On 1 April 2014, during a rainy early afternoon, LC photographed a young individual crossing the road between Makabana and Penioundou, Mougoutsi Dept, Nyanga Prov. (Figure 14). New prov. record (Pauwels and Vande weghe, 2008). LC examined three individuals killed for food consumption in Tchad 2, about 40 km ESE of Lambaréné, Ogooué & Lacs Dept, Moyen-Ogooué Prov., on 6 April, 13 May and 12 August 2012, respectively. New prov. record. With the two present new prov. records, the species is currently known from all provinces of Gabon (Pauwels and Vande weghe, 2008). Two individuals were illustrated by Le Garff (2015: 25) under the name *B. gabonica*. The photograph on the left was taken in Franceville, Haut-Ogooué Prov., the one on the right shows a captive individual in the "Terrarium & Vivarium de Kerdanet" in Plouagat, France (Le Garff, pers. comm. to OSGP, 2016). The individual illustrated on the latter photograph shows a single black triangle on the head side posterior to the eye, and is actually a *B. rhinoceros* (Schlegel, 1855), a West African species absent from Gabon.

Bitis nasicornis (Shaw, 1802)

Although not listed by Pauwels and Vande weghe (2008), the accounts on "horned vipers" in Lambaréné, Moyen-Ogooué Prov., based on personal observations by Schweitzer (1950), are undoubtedly referable to this species. On 7 Aug. 2015 one of us (CO) photographed at 15:55 an adult individual crossing a lateritic road in secondary forest (0°31'01.2"N, 12°58'53.4"E) near Mbomo, about 15 km E-SE of Makokou, Ivindo Dept, Ogooué-Ivindo Prov. (Figure 15). It loudly hissed when approached. New locality record (Pauwels and Vande weghe, 2008). On 9 Nov. 2015 CO also photographed an adult individual in the southern buffer zone (0°15'50.4"N, 13°47'16.6"E) of Mwagna NP in Ogooué-Ivindo Prov. (Figure 16). New record for the NP. With *Dipsadoboa viridis* (see above), this is only the second reptile species recorded from Mwagna NP, which was never herpetologically investigated (Vande weghe et al., 2016) but which probably houses a rich herpetofauna. On 24 July 2013 LC examined an adult individual killed by a villager along Ngou River (2.27555°N, 11.51451°E), Ntem Dept, Woleu-Ntem Prov. New dept record (Pauwels and Vande weghe, 2008). On 23 Dec. 2015 at around 11 A.M. a juvenile individual (Figure 17) was found by LC in Ayémé (0.31366°N, 9.66248°E), Komo-Mondah Dept, Estuaire Prov. It was hidden under a piece of dead wood in highly degraded secondary forest. New locality record (Pauwels and Vande weghe, 2008). During a heavy rain on 5 March 2016 at noon, LC photographed an adult individual near Lac Ngélié (Ngélié Lake; 0.67228°S, 9.42395°E) in Wonga-Wongué Presidential Reserve (Figure 18). New locality record (Pauwels, 2016; Pauwels and Vande weghe, 2008).

Acknowledgments

We are grateful to Bernard Le Garff (Université de Rennes I), Pierre Ngalamou (Yenzi), Jean Pierre Vande weghe (Brussels/Kigali) and Lee J. T. White (Agence Nationale des Parcs Nationaux, Libreville) for providing literature or useful information. Daniel Franck Idiata and Aurélie Flore Koumba Pambo (CENAREST, Libreville) kindly facilitated the research permit for PC. We thank Mike Dloogatch for editorial support.

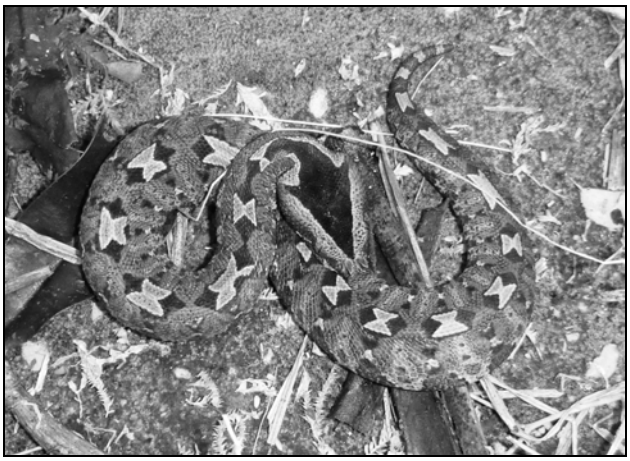

Figure 17. Juvenile *Bitis nasicornis* in Ayémé, Estuaire Prov., northwestern Gabon. Photograph by L. Chirio.

Figure 18. Adult *Bitis nasicornis* near Ngélié Lake, Wonga-Wongué Presidential Reserve, northwestern Gabon. Photograph by L. Chirio.

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Bulletin of the Chicago Herpetological Society 52(6):103-106, 2017

An Upcoming Gala Anniversary Celebration, a Lost Column, Herp Spot Selection Criteria, a Bountiful Parking Spot, and a Prelude to Lyresnakes

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Should our editor see fit to run these words, this issue will mark my second anniversary of writing for the *Bulletin*. That's right, "typing boy" here has slugged out 24 monthly columns in a row now. This one will be number 25. Whoever is planning the ticker tape parade in Chicago to commemorate this worthy accomplishment has done an excellent job of keeping it all on the down low. This author can only hope that he is served enough notice to be able to attend the festivities. Since the planning committee is trying so hard to be discreet, and keep it all from the very person who can help the most, I thought a few tactful hints on how best to proceed might be in order. I want the parade to end at Wrigley Field, just prior to the beginning of a Cubs game. It would be nice if an honor guard would escort me to the pitcher's mound, and perhaps help me to the top. Following that, I'll throw out the opening pitch. We need to have a good PA system at the mound as well, because right after that first pitch, it is my intent to read all 24 columns to the crowd. But if the organizers and promoters think it better, I can do that during the seventh inning stretch—just after I sing *Take Me Out to the Ball Game*. We may wish to link this part of it all to the local radio stations, so they can simultaneously broadcast my words to all the listeners in Chicagoland and beyond. In preparation for my part of the event, I have lined up all 24 columns on a favored USB drive, and will print them as soon as I get the word. No worries, planning committee for Roger Repp Day. When all this happens, I promise to act *very* surprised!

Well, *my* part of the planning for this celebration is ready. I *have* recently lined up all 24 columns on a USB drive. Heretofore, they were scattered about in various folders and the inbox of my email program, poised to be forever lost in cyberspace. I can only hope that I don't lose that USB drive. Now that they are all in one place, I find myself occasionally picking one off and reading it again. It may seem immodest to say so, but they are *all* good. When one writes for herpetologists, one had better be prepared to praise one's self—because said praise seldom comes from any other direction. This lack of accolades occurs despite the fact that my email address appears below my name on every column. Don't be shy—throw me a bone, herpers! The silence of the herpers was so thunderous that at first, I was concerned that people were not reading these columns. That is no longer a concern. First off, I *know* at least two others are reading these words. We speak of Mike Dloogatch, and more recently, Joan Moore. Mike has been doing the front line editing, and Joan has been picking off the typos that slip by both of us, and adding just the right words to the text to make it all count. Thankfully, neither has meddled with the style. (I wonder when they will finally crack with that.) Word also trickles my way on occasion that I have a much wider readership than I could ever imagine. When I groused about losing my Suizo Reports, offers came from five different directions to send me some back! The article that generated the most interest thus far was the one about the Gila Monster nest falling into my lap. Most of the kudos sent were along the same line: "how are you *ever* going to top this one?" While I agree that nothing better than this is ever going to come my way, as the one most familiar with my own ravings, I can tell you that article doesn't even make it to my own personal top ten list. And each article that has come after that one is, in my opinion, better. Though I hope that each article will be better than the previous one, I am always striving for "just as good."

One of the concerns that our beloved editor sometimes expresses (perhaps a form of wishful thinking) is a fear that I will run out of ideas to churn into monthly columns. Sorry Mike, that's not going to happen for a *long* time. We quit when *you* say so! "Until death do us part?" I bet our lucky editor can scarcely believe his good fortune, and the promise of receiving these columns will doubtlessly inspire him to live forever. (We *all* better hope that he lives forever!)

Having crowed far too long about 24 puny articles being published, it is time to bring it all home, and proceed with the next. One of my earlier columns was an absolute sleeper. I know what some of you smart alecks are thinking, but no, by sleeper I most definitely do not mean snooze-fest. It was the fourth column published. It appeared in the September 2015 issue of the *Bulletin* [50(9):154-155]. The article seemed to just pass everybody by without notice. Truth be told, it was designed to be the beginning of a multi-column build-up of how a place called Iron Mine Hill became the center of the longest multi-species of radio-telemetry studies on five species of venomous reptiles in the history of Arizona. But when the article was published with barely a whisper of acknowledgment from anybody, it was decided that the current shotgun approach to writing about various herping events might serve us all better.

It is time to take that first step back to Iron Mine Hill with these columns. In the process of going back, we will cut and paste some of the words from the lost column, and flesh them out. Each time we do this, the words will appear with quotation marks. We begin with my seven rules for the selection of a long term herping spot, with some explanation for each.

Roger's Rule # 1: "The place has to be less than an hour's drive from home."

This rule represents the almost famous hundred-mile circle for herping the Tucson area. If the reader ever checks out the Tucson Herpetological Society (THS) website, you will see that all the herps portrayed are under the heading of "100 Mile Circle." That particular phrase was adopted by the first THS webmaster from a presentation that this author gave in 1995. Despite discussion from two other webmasters to change it, the heading remains steadfastly in place. Since my methods center more on hiking than road cruising, the idea was to select places that were less than an hour's drive away from my domicile. In other words, 50 miles in any direction from home. That circle circumscribes some fabulous territory. It contains two National Parks, a Na-

Figure 1. Roger's Rule #2: "There has to be a good chance of herp encounters during the drive there and/or back." There are miles of smiles on the backroads to Iron Mine Hill. Image by the author.

tional Monument, the massive Coronado National Forest, and a hodgepodge of public lands under the control of BLM and State Trust. It also contains ten species of rattlesnakes, 36 other species of snakes, roughly 40 species of lizards, six types of turtles, and roughly ten species of amphibians. With all this going for it, why bother with anything else?

Well before the first visit to Iron Mine Hill ever transpired, I lived roughly 35 miles away from the place. When we purchased our new home in 2003, Iron Mine Hill *had* to be within that hundred-mile circle. I now live 33 miles from the place.

Roger's Rule # 2: "There has to be a good chance of herp encounters during the drive there and/or back." (Figure 1)

Iron Mine Hill can be accessed by any number of backroads. I mainly utilize two different routes to get there or back. 50% of the drive in either direction takes me through habitat that is not only conducive to finding herps, but also allows for such things as getting out of the vehicle to admire or photograph them with but minimal oncoming traffic to deal with. Much of the drive takes one through some very pristine patches of Sonoran Desert habitat, and is the eastern limit for the range of Sidewinders (*Crotalus cerastes*). Along with the 'winders come Desert

Figure 2. Roger's Rule #3: "Upon arrival, the chance of a herp encounter must transpire from the moment one steps out of the vehicle." There are no parking meters here—just herps! Two different Western Diamond-backed Rattlesnakes (*Crotalus atrox*) have given birth a scant 30 feet from our favored parking place. The female *atrox* in this image is closely monitoring her nesting hole. Note the shed skin of one of her neonates at the entrance. Image taken 11 August 2007 by the author.

Iguanas (*Dipsosaurus dorsalis*) and Long-nosed Leopard Lizards (*Gambelia wislizenii*), not to mention too many other species to enumerate here. By day or night, it is a good place to road cruise.

Roger's Rule #3: "Upon arrival, the chance of a herp encounter must transpire from the moment one steps out of the vehicle." (Figures 2–5)

Through the years, I have learned to designate certain patches of ground as "super sites." In order to achieve that status, the site must contain five or more individual herps of three or more species. This does not mean all in one visit; it can be across the span of several years. That being said, the place that we park at Iron Mine Hill is a super site on steroids. Relying on memory, to wit, the following herps have been found within a 50-foot radius of where we park: A Long-nosed Leopard Lizard (*Gambelia wislizenii*), two Regal Horned Lizards (*Phrynosoma solare*), several Banded Geckos (*Coleonyx variegatus*), countless Zebra-

Figure 3: On 20 August 2008, this handsome Gila Monster (*Heloderma suspectum*) wandered directly behind the rear of the author's parked truck as the author watched. It gave the truck a glance as it passed by, and continued on its way. Image by the author.

Figure 4. "I have heard stories from many herpers about finding a cool herp while urinating. That has happened at the parking spot for Iron Mine Hill." This Mojave Rattlesnake (*Crotalus scutulatus*) was found by Blake Thomason as he was engaged in, er . . . uh . . . the act. Image by the author, 27 August 2011.

Figure 5. As Marty Feldner arrived at the parking area at 1808 hours on 15 September 2012, he saw what he thought was a rubber snake laid out by the author as a joke. The only joke here was that he *thought* the real deal was a joke. This Arizona Coral Snake (*Micruroides euryxanthus*) was on the crawl to greet him as he pulled in. Image by Martin J. Feldner.

Figure 6. Roger's Rule #5: "Private residences must be miles away. (Hilltop views are best when uncluttered by human habitation)." While we can't be 100% certain, we *think* that the tortoise in the lower left foreground of this image would agree. Image by the author.

tailed Lizards (*Callisaurus draconoides*), Western Whiptail Lizards (*Aspidoscelis tigris*), and Common Side-blotched Lizards (*Uta stansburiana*). A Gila Monster (*Heloderma suspectum*) was found wandering through our parking area, as well as a Spotted Nightsnake (*Hypsiglena torquata*), a Glossysnake (*Arizona elegans*), six adult Western Diamond-backed Rattlesnakes (*Crotalus atrox*), two of which were nesting females that gave birth to 14 more, two Tiger Rattlesnakes (*Crotalus tigris*), a Black-tailed Rattlesnake (*Crotalus molossus*), a Mojave Rattlesnake (*Crotalus scutulatus*), and best of all, a Sonoran Coralsnake (*Micruroides euryxanthus*). I have heard stories from many herpers about finding a cool herp while urinating. That has happened at the parking spot for Iron Mine Hill (Figure 4).

I have gone herping with these damn ultimate super herper fools, all of them younger, who think nothing of beating themselves to death on backroads for hours to get to their assigned parking spot. Then they hike uphill for three miles or more just to get to where the targeted herps are! I immediately get suspicious when in the company of younger herp guides who say they will take me to the Promised Land. My first question is *always* "how far do we have to hike?" If the answer is in miles, as opposed to how many bottles of beer to carry, I usually bow out.

Roger's Rule #4: "The place has to be scenically pleasing to the eye."

Beauty is always in the eye of the beholder. What this beholder likes to see was also described in that lost fourth column. The brief description of my first look at Iron Mine Hill follows: "Vast stretches of white-colored boulders rumbled from top to bottom, the bottommost structures being less than a stone's-throw away from the vehicle. Saguaro cacti, tall and stately, were peppered helter-skelter among, beneath, and above the boulders. The slope was also gaily decorated with palo verde trees, mesquites, small ironwoods, prickly pears, limber bushes, hedgehog cacti, and various other plants too numerous to elucidate here."

But wait—there's more!

Roger's Rule #5: "Private residences must be miles away. (Hilltop views are best when uncluttered by human habitation)." (Figure 6)

When one stands on top of Iron Mine Hill in daylight, one sees nothing but pristine, saguaro-studded desert in any direction. It gives one the impression that one is looking at the Sonoran Desert as it was long before the area was civilized. To the south, the Owl Head Buttes rise abruptly from the landscape with a mini-monument valley gestalt. Just south of these monoliths rises the subtle curves of the Tortolita Mountains, and further in the distance the massive eminence of the Catalina Mountains thrust upward to dominate the horizon. To the east stands the lone profile of Black Mountain, and to the northeast lies the vast stretch of peaks and valleys that carry the name of 96 Hills. Directly to the north, the bulk of the gently sloping Suizo Mountains beckons one to their loving embrace. To the northwest, the abrupt battlements of the Picacho Mountains rise nearly 3,000 feet above the desert floor, and just west of these stands the famous spire of a landmark dubbed Picacho Peak. To the west, the terrain slopes gently downward toward the Santa Cruz River. Smaller eminences rise out of these saguaro-infested flats. The aptly named *Huerphano* (the Orphan) stands alone like a blemish on the landscape, and the thin strip of a mountain range called Desert Peaks offers a broadside view of their eastern flanks. To the west of the Santa Cruz River, the landscape rises abruptly again, and forms the Samaniego Hills, the Silver Bell and West Silver Bell Mountains, and my old playground, Ragged Top. It is in this westerly direction that some of the most fantastic sunsets in the world occur.

As suggested earlier, beauty is in the eye of the beholder. In my opinion, that beauty is marred when the marks of mankind lay their scars across the landscape. The top of Iron Mine Hill is the closest place to Tucson that one can stand alone and take back something worth remembering with every visit.

Roger's Rule #6: "For countless reasons, vehicular accessibility is a must."

We'll keep this one short. It should be pretty obvious that one can't visit a place three times a week if one can't get there! And while I have never told her this, I have gotten to our parking spot many times over with my wife's Toyota Corolla! (Her: "Boy! Why is my car rattling like this? It didn't rattle *before* I loaned you my car yesterday!" Him: "Sounds like a broken strut,

Figure 7. Roger's Rule #7: "The place has to have herps deemed cool and watchable." A Sonoran Lyresnake (*Trimorphodon lambda*) basking at the entrance of its overwintering crevice on 22 December 2012. This particular crevice harbored the third lyresnake found on Iron Mine Hill, and has sporadically offered visuals of a lyresnake for over 20 years! Image by the author.

sweetie. Sometimes, the darn things just snap for no reason.")

Roger's Rule #7 is the biggest. "The place has to have herps deemed cool and watchable." (Figure 7)

We go back to the original text of the lost column: "Points [i.e., Roger's Rules] 1 through 6 were apparent with the first two visits to Iron Mine Hill, but it was the third visit that nailed point 7. Said third visit occurred on 1 November 1992. Within ten minutes of emerging from the vehicle, two Sonoran Lyresnakes (*Trimorphodon lambda*) were found in separate boulder crevices. The words 'cool' and 'watchable' apply to such finds as lyresnakes to this herper. They are cool because they are snakes, and they are watchable because once one finds their lairs in late fall, one can count on seeing them multiple times throughout the winter and early spring. And there is also a strong possibility that once they leave their crevice in the spring, they will return the following fall. In short, a lyresnake in a crevice can provide years of entertainment. And two lyresnakes in crevices doubles the fun. . . . The simple act of finding them assured that I would continue to visit Iron Mine Hill. Even if nothing else had been found on that little hill, I would still be going there today to check on them. But, of course, many other herpetological treasures were uncovered with the visits that followed."

The words that you are reading today all serve as a set-up of sorts. The next column will center on a cool snake—something other than a rattlesnake. While there are still many incredible events with the buzz worms to relay, it will be refreshing to dwell on something else for a change. We're going to go back to the two lyresnakes described above, and visit many others before it's over. But that will be in a future column. For now, this author wanted to pick off one more sentence from that forgotten column: "When it comes to settling into new territory, a journey of 10,000 beers must begin with a six pack."

A journey of 10,000 beers must begin with a six pack? ***Eye like it!*** Doggone it, that line alone should have earned me a Pulitzer Prize! I want *that* right after I sing "Take me out to the ball game" during the upcoming celebration of Roger Repp Day. If nothing else, put it on my tombstone. And during the course of the 25 years that have followed this here first six pack, my calculations indicate that we have long ago entered the realm of ***round three*** of these here 10,000 beers. I hope to finish that goal before I can return no longer. I do believe that a 30,000-beer herp project will set a bar that can never be exceeded! Doing something that has never been done before in the history of mankind—isn't that what separates excellence from mediocrity? A 30,000-beer odyssey in herpdom may not seem like much to the casual observer, but have we *not* risen above the realm of *anything* casual simply by being herpetologists? Damn right we have!

This here is Roger Repp, signing off from Southern Arizona, where the turtles are strong, the snakes are handsome, and the lizards are all above average.

What You Missed at the May Meeting

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I became aware of Dr. David Steen when I started reading his blog (livingalongsidewildlife.com). He was informative, accurate, and not confrontational, which made his blog an interesting read. His blog has matured into a weekly snake identification quiz with an occasional post about other topics. As he writes in his blog, he feels "public education and outreach about wildlife ecology and conservation is important . . . " and he has zealously pursued that goal. He's on Facebook, Twitter, and Instagram. His Twitter account is the most interesting with many snake IDs and comments and questions from other scientists and the public, but he's bringing his Instagram account up to speed. I don't know if he'll manage Snapchat, but he's keeping abreast of social media better than I am. I recommend following him on any of those sites, or maybe all of them, and if you think his efforts are worthy, you can help him out on Patreon. This paragraph has pretty much exhausted my knowledge of social media, but Dave knows where information is going and he's putting much effort into using social media to its fullest.

David Steen. Photograph by Dick Buchholz.

After I'd been following him for a while I heard him in a podcast and thought he would be a good speaker. We invited him to speak at last fall's Midwest Herp Symposium and, as were all the speakers, he was really good. I'm sorry for you if you missed that event. Dr. Steen was so good that we invited him to speak at our May meeting, and we were not disappointed.

Here's his biography from our web site:

> Dr. David Steen is an assistant research professor in the Department of Biological Sciences at Auburn University and affiliated with the Alabama Natural Heritage Program. David received his B.S. from the University of New Hampshire, his M.S. from SUNY, College of Environmental Science and Forestry, and his Ph.D. at Auburn University; he also completed a postdoctoral position at Virginia Tech studying turtle ecotoxicology. Aldo Leopold said, "There are some who can live without wild things and some who cannot." David is one of the latter. As a wildlife ecologist and conservation biologist, his goals are to generate a better understanding of how wildlife populations use and persist on landscapes as well as recommendations regarding how we can develop, farm, restore, and live on these landscapes while accommodating wildlife (particularly amphibians and reptiles) and natural ecological processes. David is also an active science communicator, reaching tens of thousands of people each day through his blog and social media.

Dave feels that snakes and turtles are too often overlooked in studies of population dynamics and conservation methods. He titled his talk, "Snakes and Turtles as Model Organisms in Community Ecology and Conservation Research." Using results from some of his investigations, he built a case that these animals might be ideal subjects for such efforts. Snakes and other reptiles and amphibians often have much higher concentrations and higher diversity of species in relatively small areas compared to mammals or birds, so why aren't they used more? One answer is that most are hard to find even in areas where they are abundant.

Qualitative descriptions of animals' habitats or comparing abundance in different habitats may tell us where the animals are, but not why they're there. Dave loves fieldwork, but to delve deeper he stepped back and gathered data from other studies and reports. Making sure that the parameters of the studies conformed, Dave gathered presence/absence data from about 300 traps covering 13 species across the southeastern U.S., compiling snake trap data, characterizing land cover, and developing a dozen hypotheses. He used the data and the results of literature searches to develop mathematical models that might predict a species' presence. We saw a slide with a dozen different graphs on occupancy probabilities of various snake species in various habitats, and Dave didn't go into all, but highlighted some interesting finds. *Crotalus adamanteus* (eastern diamondbacked rattlesnake) and *Pituophis ruthveni* (Louisiana pinesnake) are both classic longleaf pine savanna inhabitants, but his data show that they do better in forests with hardwoods mixed into the longleaf pine rather than pure pine. Eliminating all hardwoods as sometimes happens may not be the most effective conservation strategy.

Co-occurrence is the foundation of community ecology and Dave is really interested in it. How do species share habitat? Do they partition resources, use different habitats, eat different foods, or compete with each other? If a half dozen different species of mammals occupied the same area, these questions would be studied, but snakes are often simply explained by evolutionary pressures that were established in the distant past. Dave conceived of using the data that he collected to test if snakes respond to the same pressures that other animals are susceptible to. Not "rubbing it in" to us Midwesterners, Dave gave examples of the many species of very similar snakes that co-occur in the Southeast U.S. They have corn snakes and rat snakes, diamondbacks and timbers, and racers and coachwhips sharing the same territories and Dave thought that he might use the data set that he developed to explore some of the factors that affect their distribution.

So the example he first talked about involved timbers and diamondbacks. When there is a just a little evergreen forest in the landscape, the two species occur together more often than chance would predict, but as the amount of evergreen increases, timber rattlesnakes drop out. Interestingly, in the absence of diamondbacks, timbers prefer pine forests. So apparently the presence of diamondbacks does affect timber populations. Corn snakes and rat snakes seemed to show no effect on each other, but racers and coachwhips were interesting. And confusing. The two species occur together in the same habitat, and it appears that what is good for one is good for the other . . . until there is a lot of grass. Then racers dropped out. While Dave gave some

plausible hypotheses for the timber/diamondback situation, he admitted failure to come up with any plausible explanation for the racer/coachwhip result.

But he and his colleagues looked at sizes in coachwhips and racers, controlling for several factors such as sex differences and habitat and found that racers coexisting with coachwhips were smaller than racers not living around coachwhips, a result they had predicted. They would have anticipated that coachwhips would be larger if no racers were present, but racers "were everywhere" so they couldn't test that. To Dave, the real significance of these results show that snakes are still adapting and responding to current conditions. They're not set in stone.

Competition for resources is not the only way snakes affect other snakes. Kingsnakes and indigos are both predators on other snakes, and Dave gathered data from past papers and performed field studies that demonstrated that lack of indigos and kingsnakes results in increased numbers of copperheads. Dave again stressed that there are insufficient studies on these animals that could be ideal models for population studies. To demonstrate, he showed a cool video of interspecies combat between a cottonmouth and a copperhead. The video is on YouTube, so look it up. It certainly raises many questions. Dave proposes that many answers will not be forthcoming until manipulative experiments are conducted that can give strong results.

Then he switched gears and began to talk about freshwater turtle conservation. We've all seen turtles hit on the road. How do road deaths affect population size? Dave and his coworkers again went to the literature and surveyed the sex ratios by species of 31,294 turtles collected off-road and 6,872 turtles collected as road-kills. Female deaths would be a greater threat to the population, and they predicted that there would be a higher proportion of females in the road-killed specimens than in those collected off-road. Comparing the ratios, slider turtles collected off-road were 38% female, and those collected from roads were 77% female. But all results were not this disparate. Mud turtles were 41% female off-road and 50% on-road. To find out if higher female road deaths had an effect on the population, Dave needed field studies. They studied sex ratios in populations surrounded by few roads versus populations surrounded by many roads and there the results were dramatic. Females made up 46% of the painted turtles in areas with few roads, but only 26% in areas with high road density. Snapping turtles were 26% female in low-road areas and only 5% in high-road areas. Supporting this was a literature search that showed that along with the increase in roads over the last hundred years, the percent of males increased also. What should be done?

Dave conducted a literature search for every record of every turtle nest to see how the females were using the environment. Alligator snapping turtles are endangered, but probably not from roads because 50% of nests could be protected with a two-meter buffer around the wetland but map turtles would need 24 meters and common snapping turtles would need 93 meters. Habitat usage certainly needs to be considered when developing conservation strategies.

Another study Dave conducted involved a hazardous waste spill into the Clinch River in 2009. While X-raying hundreds of turtles to check on effects of the chemicals, Dave began recording what else the X-rays showed. We looked at radiographs of fishhooks inside turtles. As many as 10% of the adult male snapping turtles had hooks and 33% of the females, with hooks present in anywhere from 4 to 6% for other species. Dave was disappointed at the lack of response to his published paper, but using data from deaths caused by swallowed hooks in sea turtles, he figured that ingested fishing hooks would likely be a threat to sustainable populations. His last slide was titled, "Is It Worse than We Think?" and Dave's answer is—probably. He was able to examine only turtles that managed to survive long enough to be captured. He couldn't account for the turtles that died before they could be captured.

I like the thinking that went through Dave's talk: The questions and the ideas on how to find the answers. The serendipity of discoveries leading to other areas of research. The care in not jumping to conclusions based on insufficient evidence. His passion in conducting research and educating the general public. It was a real pleasure to have him visit. You should have been there.

Herpetology 2017

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.

COLLARED LIZARD HATCHLING SEX RATIOS

E. Santoyo-Brito et al. [2017, Journal of Herpetology 51(2): 197-201] report that increasing evidence indicates that sex-determination mechanisms in reptiles (genotypic sex determination [GSD] and temperature-dependent sex determination [TSD]) are considerably labile and not mutually exclusive. Environmental factors can override GSD in some reptile species and some species shift from GSD to TSD at certain temperatures. The authors present data on the effects of incubation temperature on sex ratio in collared lizard (*Crotaphytus collaris*) hatchlings. Eggs were incubated at one of seven constant temperatures. More males were produced at both lower and higher temperatures and more females at intermediate temperatures. Although none of the seven treatments produced only females or only males (nor even differed significantly from an equal sex ratio), incubation at different constant temperatures influenced hatchling sex ratios and produced an overall statistically significant pattern, consistent with TSD pattern II but in an inverse way. Even with a lack of evidence, GSD has been suggested as the sex-determining mechanism in the species. The results of this study suggest that sex ratio is modified in a consistent pattern depending on incubation temperature; therefore, labeling this species GSD is premature. More research is needed, however, to conclude that *C. collaris* is a TSD species or a GSD species with temperature interacting with genetic factors.

GIANT GARTERSNAKE OCCUPANCY

E. C. Hansen et al. [2017, Journal of Herpetology 51(2):274-283] note that habitat loss and modification are causing declines in the abundance and distribution of plant and animal species, yet robust information on which to base management and regulatory decisions for these species frequently is not available. *Thamnophis gigas* (giant gartersnakes), a species listed as threatened under the U.S. and California Endangered Species Acts, is strongly associated with aquatic ecosystems in the Great Central Valley (California), yet many aspects of its ecology remain poorly understood. The authors evaluated relationships between environmental attributes and occupancy of *T. gigas* and predicted the species' occupancy across ~300,000 ha in the northern Central Valley. They trapped *T. gigas* at 159 sites and characterized land cover, land use, and soil type at each site. Occupancy of *T. giga*s was strongly and negatively associated with elevation and strongly and positively associated with canal density and the proportion of rice and perennial wetland. There was also a strong and previously undescribed association between occupancy and soil order. Estimated occupancy was over five times greater at sites underlain by alfisols, molisols, and vertisols than at sites underlain by entisols and inceptisols. The statistical associations between environmental variables and occupancy were used to predict occupancy at a spatial resolution and extent consistent with management of both *T. gigas* and regional land and water use.

THREE ENDANGERED MEXICAN AMBYSTOMATIDS

G. Woolrich-Piña et al. [2017, The Herpetological Bulletin 139:12-15] report that the populations of ambystomatid salamanders around Mexico City are subject to a variety of threats, and some populations may be in decline. Three *Ambystoma* species found around Mexico City and in central Mexico are *A. altamirani*, *A. leorae* and *A. rivulare*, and these three species are subject to a variety of conservation threats. The authors compiled a database of localities for these ambystomatid salamanders. The compiled observations of these three species of endangered salamanders suggest several patterns: 1) most localities for all three species are in the Estado de México, including several for *A. altamirani* within the borders of Mexico City; 2) there is little, if any, geographical overlap among these three species; 3) the relatively few documented sites for *A. leorae* and *A. rivulare* highlight their tenuous conservation status. The authors hope that presenting a map of documented locations of these three Mexican *Ambystoma* in this paper creates a starting point for future studies on these salamanders.

TADPOLE RESPONSES TO DETRITUS QUALITY

K. Barrett et al. [2017, Journal of Herpetology 51(2):227-231] note that although many non-native species negatively influence amphibian populations, non-native aquatic vegetation has been documented to have positive, negative, and neutral effects on anuran larvae. To evaluate the response of anurans to non-native plants, they exposed two frog species, gray treefrog (*Hyla versicolor/chrysoscelis*) and southern leopard frog (*Lithobates sphenocephalus*), to detritus from either native hardwood trees, non-native purple loosestrife (*Lythrum salicaria*), or a mixture of both. Experiments were conducted in artificial ponds, and the authors recorded the survival, growth, and metamorphic size of larvae. Gray treefrog survival was highest in tanks with native leaf litter. Developmental time did not differ among treatments, but tadpoles in tanks with purple loosestrife were significantly larger than those in tanks with native leaf litter. Southern leopard frog survival was lowest in the mixed vegetation treatment. As with gray treefrogs, developmental time was not influenced by treatment, but larvae from tanks with purple loosestrife were significantly larger than those from other treatments. Lower survival in the presence of purple loosestrife has been linked to secondary compounds in the plant, and the higher growth rates we observed are consistent with recent findings on response of anuran larvae to other non-native plants. These results suggest the negative effects of purple loosestrife detritus on the species examined are manifest at the individual and (perhaps) population level. Because the fewer animals that did survive in tanks with purple loosestrife grew larger, overall ecosystem-level effects may not be present; however, larger scale experiments are needed to evaluate this hypothesis.

BIASES IN MEASURING SNAKE DIETS

X. Glaudas et al. [2017, Herpetologica 73(2):121-128] note that examination of the gastrointestinal contents of museum specimens is routinely used as a method for assessing diet in a wide variety of reptiles. However, this method might be biased toward detecting prey items that are less digestible and larger in size because these food items are digested more slowly. This study used fixed videography on free-ranging Puff Adders (*Bitis arietans*) as a comparative, data-collecting technique to assess the accuracy of the traditional method of examination of the gastrointestinal tracts of museum specimens as a measure of diet. The data-collecting method affected our measures of diet: Analyses relying on museum specimens showed a much narrower diet breadth compared to fixed videography, and measures of mean relative prey mass were more than three times larger using museum specimens compared to fixed videography. Our findings demonstrate that data collected through fixed videography and examination of museum specimens provide different perspectives of a snake's diet because of the biases associated with museum specimens. As a result, the use of museum specimens to assess diet should be interpreted cautiously and with knowledge of these biases, as the technique might only reveal certain aspects of a species trophic ecology. In particular, we suggest that the routine use of methods such as examination of museum specimens and palpation of live snakes might have led to a biased interpretation of the feeding ecology of ambush-foraging snakes.

YELLOW-BLOTCHED MAP TURTLE PATTERNS

W. Selman [2017, Herpetologica 73(2):105-112] notes that considerable difficulty has been associated with the taxonomy of the genus *Graptemys* (map turtles and sawbacks) over the last 50 years, likely attributable to the relatively recent divergence of lineages and morphological variation within species. One trait that has been inconsistently defined has been the costal scute pattern of *Graptemys flavimaculata*, with many authors describing various blotch or ring patterns, or both. This study seeks to describe and quantify costal scute pattern via ring presence throughout the range of *G. flavimaculata* using both contemporary (field-captured) and historical (museum specimen) sources. Comparisons were made for contemporary individuals and historical specimens of both sexes throughout the geographic range. The pattern of all blotches dominated both sources (89.8%), whereas historical specimens had a higher rate of ring presence (15.1%) compared with contemporary individuals (8.6%). For contemporary data, ring presence was lower in headwater reaches (4.1–4.8%), but higher in middle to lower reaches of the river system (8.9–35.5%). Pattern variability might be attributable to environmental selection, incubation temperatures, genetic divergence, or a combination thereof. For historical specimens, geographic patterns observed were incongruent to contemporary data and likely attributable to geographic sampling bias. Considerable temporal and sexual bias was also observed in the specimen record as a result of species protections in the early 1990s and sampling methodology, respectively.

CONSERVATION AND RECOVERY OF GHARIALS

K. P. Acharya et al. [2017, Herpetologica 73(2):129-135] report that the remnant populations of gharials, *Gavialis gangeticus*, are now confined to the large, deep rivers of northern India and Nepal. In lowland Nepal, the populations are restricted to a few stretches of the Narayani–Rapti and Karnali–Babai river systems. Periodic censuses of the wild populations have been made over the past 12 years. The authors present population trends of Gharials in the Narayani, Rapti, and Babai rivers based on these surveys. The results indicate that the combined numbers of adults and subadults have been gradually increasing since 2005, but the numbers of adults are low and female biased, with very few males recorded from all study sites. In 1978, Nepal established a captive breeding center in Chitwan National Park, from which captive-bred animals have been periodically released 4–7 years after hatching, at which time the animals are about 1.5 m total length. The detection of hatchlings and subadult classes that are smaller than these released animals in the rivers indicates that there is natural recruitment. Therefore, collecting all nests for ex situ breeding might not be the best strategy until more rigorous field assessments are completed to determine the relative contributions of captive-bred versus natural recruitment. The authors suggest that more effort should be channeled toward field assessments, including mapping and monitoring habitat availability, habitat management to ensure necessary environmental flows to create sand banks and deep pools, and research to better understand the ecology and behavior of gharials in Nepal's rivers.

DOING WITHOUT TAILS

A. L. Hessel et al. [2017 Herpetologica 73(2):100-104] note that the ability of plethodontid salamanders to jump has been recognized for over 100 years, but the mechanics of the jump are only now being elucidated. These salamanders often autotomize tails that can be as much as a third of the body mass. Tail loss alters jump performance in some lizards and therefore may also alter jump performance in the plethodontid salamanders. This study used a high-speed camera to record subjects representing three species of plethodontid salamanders jumping with and without tails. The kinematic analyses indicate that take-off velocity, take-off angle, and maximum height are similar between salamanders with and without tails. Jump characteristics are highly variable within the individual for all salamanders (with or without tails) and this indicates that salamanders do not need to produce the same jump consistently to succeed in their primary task of escape. Better coordination might exist for arboreal plethodontid salamanders that use jumping for purposes other than escape. Future studies should focus on the in-air dynamics and landing kinematics of the salamander, as the tail plays a large role during in-air balance and landing control in other tetrapod species that jump.

Advertisements

For sale: **highest quality frozen rodents**. I have been raising rodents for over 30 years and can supply you with the highest quality mice available in the U.S. These are always exceptionally clean and healthy with no urine odor or mixed in bedding. I feed these to my own reptile collection exclusively and so make sure they are the best available. All rodents are produced from my personal breeding colony and are fed exceptional high protein, low fat rodent diets; no dog food is ever used. Additionally, all mice are flash frozen and are separate in the bag, not frozen together. I also have ultra low shipping prices to most areas of the U.S. and can beat others shipping prices considerably. I specialize in the smaller mice sizes and currently have the following four sizes available: Small pink mice (1 day old—1 gm) , $25 /100; Large pink mice (4 to 5 days old—2 to 3 gm), $27.50 /100; Small fuzzy mice (7 to 8 days old—5 to 6 gm) , $30/100; Large fuzzy mice / hoppers (10 to 12 days old—8 to 10 gm), $35/100 Contact Kelly Haller at 785-234-3358 or by e-mail at kelhal56@hotmail.com

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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 mdloogatch@chicagoherp.org.

NEW CHS MEMBERS THIS MONTH

Jordie Formicola
David Reavill
Brandon J. Neises
Sammy Velazquez
Kyle Sterling

Minutes of the CHS Board Meeting, May 19, 2017

President Rich Crowley called the meeting to order at 7:36 P.M. Board members Dan Bavirsha, Andy Malawy, Linda Malawy and Jessica Wadleigh were absent. The minutes of the April 14 board meeting were read and accepted with changes.

Officers' Reports

Membership secretary: Mike Dloogatch read the list of expiring memberships. Mike also infoemed the board of the death of long-standing member Dean Ripa.

Media secretary: Morgan Lantz plans to evaluatate Nonprofits on Facebook, to see what benefits might be there for the CHS, particularly for fund-raising. Liz Chapa and Rich Lamszus need to be able to update the Junior Herpers website.

Sergeant-at-arms: Attendance at the April 26 general meeting was 27.

Committees

Shows: Dick Buchholz read through the list of upcoming shows. From now on Dick will give reimbursements for lunches bought at the shows only to volunteers who confirmed with him beforehand that they would be participating.

Jr. Herpers: Eddie Exconde did a great job as speaker at the May meeting. There were 42 in attendance. Lalainya Goldsberry will speak on frog call surveys at the June meeting.

Old Business

John Bellah is continuing to seek out possible back-up venues for ReptileFest. He plans to contact facility managers at various local colleges.

The meeting adjourned at 9:27 P.M.

Respectfully submitted by recording secretary Gail Oomens

SHOW SCHEDULE

In addition to ReptileFest the Chicago Herpetological Society puts on many live animal displays throughout the year. The events now scheduled for June through August are listed below. CHS members who wish to participate in an event should call or text ahead to Show Coordinator Dick Buchholz, 805-296-9516, to confirm.

- Notebaert Nature Museum, first full weekend of each month, Saturday and Sunday, 10 A.M. – 3 P.M.
- All Animal Expo, first Saturday & third Sunday of each month, 10 A.M. – 3 P.M., Dupage County Fairgrounds, Wheaton.
- Greek Festival, July 8–9, 3 P.M. – 9 P.M., St. Andrews Greek Orthodox Church, 5649 N Sheridan Rd., Chicago.
- MSI Members Night, July 19, 5:30 P.M. – 9 P.M., Museum of Science and Industry, Chicago.
- Sheffield Garden Walk, July 22–23, Noon – 9 P.M., Sheffield & Webster, Chicago.
- Raging Waves Waterpark, July 29–30, 10 A.M. – 7 P.M., 4000 Bridge St, Yorkville.
- Back to School Fair, August 12, 10 A.M. – 3 P.M., First Christian Church, Downers Grove.
- Raging Waves Waterpark, August 13, 10 A.M. – 6 P.M., 4000 Bridge St, Yorkville.
- BugFest, August 19, 9 A.M. – 2 P.M., Red Oak Nature Center, 2343 S River St, Batavia.
- Meet the Creek, September 16, Noon – 4 P.M., Kiwanis Park, Brookfield.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, June 28, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. This will be our popular and always well-attended annual **Show & Tell** meeting. Bring an animal that you find interesting for one reason or another and be prepared to give a short (under five minutes) presentation to the group. Don't be shy. Neither age (yours) nor commonness (the animal's) should be a limitation.

The speaker for the July 26 meeting has not yet been confirmed.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum—the **Peggy Notebaert Nature Museum**. This beautiful 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. Afterwards, some of us adjourn to a local restaurant for food, drink and conversation. All are welcome.

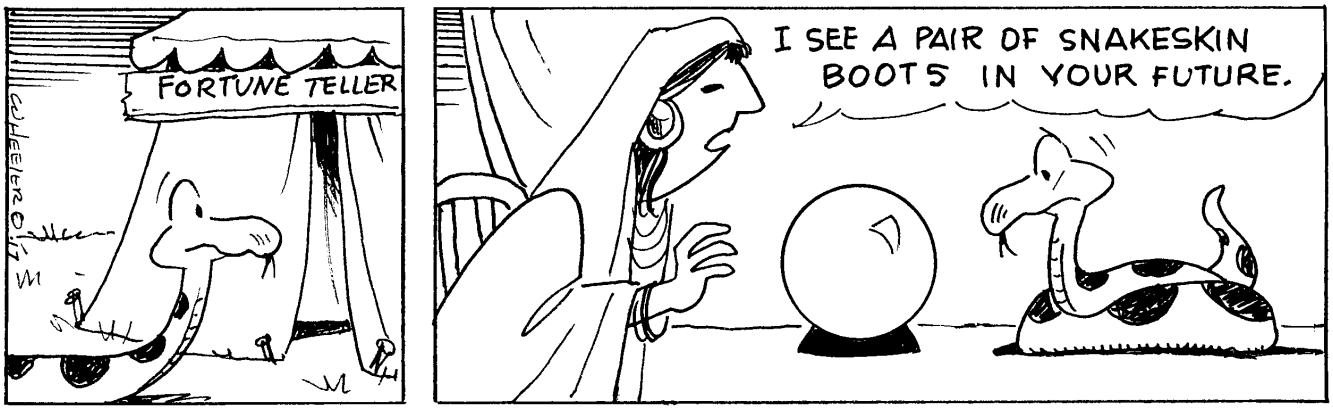
Board of Directors Meeting

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 next board meeting, to be held at 7:30 P.M., Friday, July 14, 2017, at the Schaumburg Township District Library, 130 S. Roselle Road, Schaumburg.

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 visit the group's Facebook page.

THE ADVENTURES OF SPOT



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