BULLETIN
of the
Chicago Herpetological Society

Volume 55, Number 2
February 2020

BULLETIN OF THE CHICAGO HERPETOLOGICAL SOCIETY
Volume 55, Number 2
February 2020

A Case of Predation by *Naja samarensis* (Elapidae) on *Cyclocorus nuchalis nuchalis* (Lamprophiidae) on Mindanao Island, Philippines . . . . . Olivier S. G. Pauwels and Jonathan Brecko 25

Notes on Mexican Herpetofauna 34: Herpetofauna Associated with Pine Forests in Nuevo León, Mexico . . . . . David Lazcano, Juan Antonio García-Salas, Javier Banda-Leal, Larry David Wilson, Susana Favela-Lara, Miriam Elizabeth Solis-Baraja and Silvana Pacheco-Treviño 27

The Odyssey of 10,000 Beers: The First Six-pack of the Suizo Mountain Project . . . . . Roger A. Repp 40

Minutes of the CHS Board Meeting, January 17, 2020 45

What You Missed at the January Meeting: Mike Stefani . . . . . John Archer 46

Advertisements 48

New CHS Members This Month 48

Cover: Ventral view of a preserved juvenile *Naja samarensis* and its ingested prey *in situ*, an adult *Cyclocorus nuchalis nuchalis* from Mindanao Island, Philippines. μCT scan by Jonathan Brecko.

The Chicago Herpetological Society is a nonprofit organization incorporated under the laws of the state of Illinois. Its purposes are education, conservation and the advancement of herpetology. Meetings are announced in this publication, and are normally held at 7:30 P.M., the last Wednesday of each month.

Membership in the CHS includes a subscription to the monthly *Bulletin*. Annual dues are: Individual Membership, $25.00; Family Membership, $28.00; Sustaining Membership, $50.00; Contributing Membership, $100.00; Institutional Membership, $38.00. Remittance must be made in U.S. funds. Subscribers outside the U.S. must add $12.00 for postage. Send membership dues or address changes to: Chicago Herpetological Society, Membership Secretary, 2430 N. Cannon Drive, Chicago, IL 60614.

Manuscripts published in the *Bulletin of the Chicago Herpetological Society* are not peer reviewed. Manuscripts and letters concerning editorial business should be e-mailed to the editor, mdloogatch@chicagoherp.org. Alternatively, they may be mailed to: Chicago Herpetological Society, Publications Secretary, 2430 N. Cannon Drive, Chicago, IL 60614. **Back issues** are limited but are available from the Publications Secretary for $2.50 per issue postpaid.

Visit the CHS home page at <http://www.chicagoherp.org>.

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.

A Case of Predation by *Naja samarensis* (Elapidae) on *Cyclocorus nuchalis nuchalis* (Lamprophiidae) on Mindanao Island, Philippines

Olivier S. G. Pauwels [1] and Jonathan Brecko [1, 2]

Naja samarensis Peters, 1861, is a poorly known cobra endemic to the Philippines where it has been recorded from the islands of Basilan, Bohol, Camiguin Sur, Dinagat, Leyte, Mindanao and Samar (Leviton et al., 2014, 2018; Wallach et al., 2014; Sy and Mangkabong, 2018). David et al. (2006) newly recorded this cobra species from South Cotabato Province in Mindanao based on a juvenile male (RBINS 17204) caught on 1 April 1998 in primary forest between 1000 and 1100 m asl on Mount Tasaday in Manobo Tasaday Special Forest Reserve. This specimen shows (paired characters are given left/right) a snout–vent length of 301 mm, a tail length of 54 mm, two internasals; two prefrontals; 7/7 supralabials, whose 3rd and 4th are in contact with the orbit on each side; no loreal; 1/1 preoculars; no suboculars; 3/3 postoculars; 2 anterior temporals on each side (temporal formula (1/(1+1)) + 3 on each side); 1/1 supraoculars; 8/8 infralabials whose four first are on each side in contact with the first pair of sublinguals; an extralabial on each side between the 4th and 5th infralabials; 21-19-13 dorsal scale rows (counted respectively at one head length behind head, at midbody above the ventral corresponding to half of the total number of ventrals, and at one head length before vent), smooth; 2 preventrals followed by 174 ventrals (counted after the method of Dowling, 1951), unkeeled; a single anal scale; and 46 divided, unkeeled subcaudals (terminal pointed scale not included; tail complete). It displays a black 8-shaped nuchal mark.

A re-examination of this cobra showed that it contained an elongate prey. We hence digitized the cobra, using high resolution X-ray computed tomography (RX EasyTom 150, 90 kV, 24 W, 34.87 μm voxel size; segmentation and rendering done using Dragonfly software version 4.1 for Windows [Object Research Systems Inc., Montreal, Canada, 2019; software available at <http://www.theobjects.com/dragonfly>]). The 3D rendering of the re-constructed slices revealed that the cobra contained a snake whose length was comparable to its own length (Figure 1). We dissected the cobra after performing the μCT scan, and examined its stomach contents: an adult female *Cyclocorus nuchalis nuchalis* Taylor, 1923 (Lamprophiidae), whose head and nape were digested (Figure 2). The prey shows a snout–vent length of more than 228 mm (head missing, destroyed by digestion); a tail length of 77 mm (tail complete); >110 unkeeled ventrals (anteriormost ventrals destroyed by digestion); 17-17-15 dorsal scale rows; all dorsals smooth; no enlarged vertebral scales; a single anal scale; and 45 single, unkeeled subcaudals. Its dorsum is brown, with a mediodorsal stripe running to the tip of the tail. Its yellowish belly shows two very irregular, discontinuous black stripes on each side of the ventrals. It was registered under RBINS 19379, and its identification was confirmed by comparison with the morphological data presented by Leviton (1967) and with another preserved adult specimen (RBINS 14946) from the same locality (see David et al., 2006). *Cyclocorus nuchalis nuchalis* is a poorly known forest-dwelling terrestrial snake with a distribution limited to Basilan and western Mindanao islands (Leviton, 1967; Leviton et al., 2018).

Referring to a specimen of *Naja samarensis* from Zamboanga kept alive in captivity, Taylor (1922: 262) noted "It readily takes living frogs and snakes (*Calamaria gervaisii*) for food. Snakes, lizards, and frogs probably form its food under natural conditions." Gressitt (1937) found two murine rodents in the stomach of an individual from Maluko in western Mindanao. Leviton repeated the latter observation as follows: "Gressitt (1937) reported on one individual whose stomach contained the re-

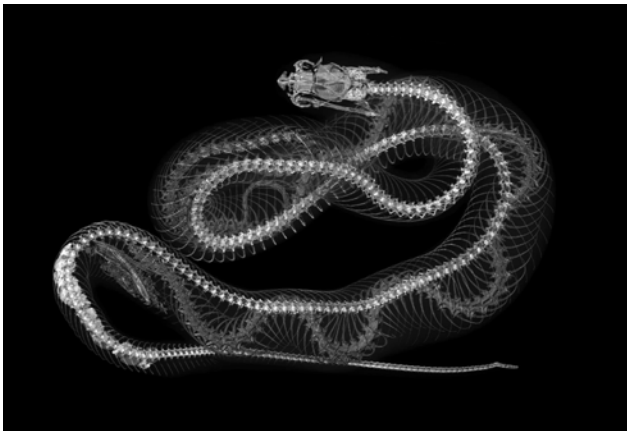


Figure 1. Ventral view of a preserved juvenile *Naja samarensis* (RBINS 17204) and its ingested prey *in situ*, an adult *Cyclocorus nuchalis nuchalis* (RBINS 19379) from Mindanao Island, Philippines. μCT scan by J. Brecko (3D model can be found at <https://sketchfab.com/3d-models/09b91b0fc4ae4d0a94af0ae53f910ebf>).

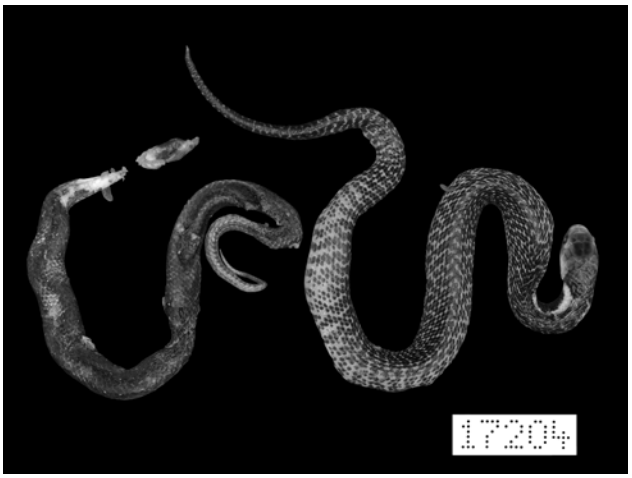


Figure 2. Dorsal view of a preserved juvenile *Naja samarensis* (RBINS 17204, right) and its prey removed by dissection, an adult *Cyclocorus nuchalis nuchalis* (RBINS 19379) from Mindanao Island, Philippines. Photograph by J. Brecko. The label is 40 mm long.

1. Department of Recent Vertebrates, Royal Belgian Institute of Natural Sciences (RBINS), Rue Vautier 29, B-1000 Brussels, Belgium. osgpauwels@yahoo.fr

2. Royal Museum for Central Africa, Leuvensesteenweg 13, 3080 Tervuren, Belgium. jbrecko@naturalsciences.be

mains of several marine [*sic*!] mammals," and added that a specimen he examined contained four "newly born young of some rodent." Smith (1993) reported that this cobra species "is known to eat frogs, snakes (*Calamaria gervaisi* [sic]), and rodents (Gressitt, 1937; Leviton, 1964c [1965]; Taylor, 1922)." Smith added that an Eastern Mindanao individual that he had examined contained a *Rhinella marina* (Linnaeus, 1758) (Anura: Bufonidae) with a snout–vent length of 95 mm, and that Van Wallach informed him that he had found only *Rhinella marina* in the stomachs of several individuals he collected in rice paddies near Surigao on Mindanao. These latter observations were obviously overlooked by Ravalo et al. (2019) who claimed to provide the first report of predation by *Naja samarensis* on *Rhinella marina*; the single case they reported happened in Davao City. Frömberg (2010) fed captive individuals with mice and small to medium-sized rats.

Our new record adds a rare snake to the known spectrum of the diet of *Naja samarensis*, which is probably very eclectic, in view of the diversity of preys (anuran amphibians, squamate reptiles and rodents) recorded to date from the wild and from captivity.

Acknowledgments

We are grateful to Gernot Vogel (Heidelberg) for his help with literature.

Literature Cited

David, P., O. S. G. Pauwels, P. F. A. G. Lays and G. L. Lenglet. 2006. On a collection of reptiles from southern Mindanao Island, the Philippines. Bulletin de l'Institut Royal des Sciences naturelles de Belgique, Biologie 76:201-227.

Dowling, H. G. 1951. A proposed standard system of counting ventrals in snakes. British Journal of Herpetology 1(5):97-99.

Frömberg, C. 2010. Haltung und Nachzucht der Samar-Kobra (*Naja samarensis*). Reptilia (Münster) 15(81):64-73.

Gressitt, J. L. 1937. Note on a Philippine cobra. Copeia 1937(1):73.

Leviton, A. E. 1965. Contributions to a review of Philippine snakes, VII. The snakes of the genera *Naja* and *Ophiophagus*. Philippine Journal of Science 93[1964](4):531-550.

————. 1967. Contributions to a review of Philippine snakes, IX. The snakes of the genus *Cyclocorus*. Philippine Journal of Science 94[1965](4):519-533.

Leviton, A. E., R. M. Brown and C. D. Siler. 2014. The dangerously venomous snakes of the Philippine Archipelago. Pp 473-530. *In*: G. C. Williams and T. M. Gosliner, editors, The Coral Triangle: The 2011 Hearst Philippine Biodiversity Expedition. San Francisco: California Academy of Sciences.

Leviton, A. E., C. D. Siler, J. L. Weinell and R. F. Brown. 2018. Synopsis of the snakes of the Philippines. A synthesis of data from biodiversity repositories, field studies, and the literature. Proceedings of the California Academy of Sciences (ser. 4) 64(14):399-568.

Ravalo, D. D. A., J. R. D. Gersava, J. E. Alojado, M. J. M. M. Achondo and L. E. D. Gamalo. 2019. Predation of Samar Cobra *Naja samarensis* Peters, 1861 on the invasive Cane Toad *Rhinella marina* (Linnaeus, 1758) in Davao City, Philippines. Herpetology Notes 12:1023-1025.

Smith, B. E. 1993. Notes on a collection of squamate reptiles from Eastern Mindanao, Philippine Islands. Part 2: Serpentes. Asiatic Herpetological Research 5:96-102.

Sy, E. Y. and S. G. Mangkabong. 2018. First record of Southern Philippine Cobra *Naja samarensis* on Basilan Island, Philippines. Southeast Asia Vertebrate Records 2018:78-79.

Taylor, E. H. 1922. The snakes of the Philippine Islands. Publication no. 16. Manila: Manila Bureau of Sciences.

Wallach, V., K. L. Williams and J. Boundy. 2014. Snakes of the world. A catalogue of living and extinct species. Boca Raton, London & New York: CRC Press.

Notes on Mexican Herpetofauna 34: Herpetofauna Associated with Pine Forests in Nuevo León, Mexico

David Lazcano [1], Juan Antonio García-Salas [2], Javier Banda-Leal [3], Larry David Wilson [4], Susana Favela-Lara [5], Miriam Elizabeth Solis-Baraja [1] and Silvana Pacheco-Treviño [5]

Abstract

For more than two decades we have studied the herpetofauna of the pine forests at nine sites in the Sierra Madre Oriental in the Mexican state of Nuevo León. We recorded a total of 34 species, including two anurans, two salamanders, 15 lizards and 15 snakes. From five to 12 species are recorded at each of the nine study sites. Of the species total, 17 are endemic to Mexico, 16 occur only in Mexico and the United States, and one occurs only in Mexico and Central America. Based on the SEMARNAT system of conservation assessment, six species are assessed as Threatened, 10 of Special Protection, and 18 are unevaluated. Using the IUCN system, two species are judged as Endangered, three as Near Threatened, 26 as Least Concern, and three are not evaluated. Estimations of population status provided by the IUCN demonstrate the following assignments: unknown (four species); stable (24 species); decreasing (three species); and not evaluated (three species). Employment of the EVS system demonstrates that five species are allocated to the low vulnerability category, 13 to the medium category, and 16 to the high category. The proportion of endemic species increases from low through medium to high EVS categories of vulnerability. Twelve herpetofaunal species are shared with the Sierra Madre Occidental. We conclude that continued study of the Nuevo León pine forests is necessary, especially with a view to providing protection for the relatively high number of Mexican endemic species resident there.

Resumen

Estudiamos la herpetofauna de los bosques de pinos durante dos décadas en nueve sitios de la sección de la Sierra Madre Oriental que se encuentra en el estado mexicano de Nuevo León. Registramos un total de 34 especies, incluyendo dos anuros, dos salamandras, 15 lagartijas y 15 serpientes. Se registran de cinco a 12 especies de los nueve sitios de estudio. Del total de especies, 17 son endémicas de México (MXEN), 16 ocurren solo en México y los Estados Unidos (MXUS), y una ocurre solo en México y América Central (MXCA). Sobre la base del sistema de evaluación de conservación SEMARNAT, seis especies se evalúan como Amenazadas, 10 de Protección especial y 18 no están evaluadas. Usando el sistema de la UICN, dos especies son juzgadas como En Peligro, tres como Casi Amenazadas, 26 como Preocupación Menor, y tres no son evaluadas. El empleo del sistema del EVS demuestra que se asignan cinco especies a la categoría de baja vulnerabilidad, 13 a la categoría media y 16 a la categoría alta. La proporción de especies endémicas aumenta de las categorías de vulnerabilidad de SVE de bajo a medio a alto. Doce especies de herpetofauna se comparten con la Sierra Madre Occidental. Concluimos que el estudio continuo de los bosques de pino de Nuevo León es necesario, especialmente con miras a brindar protección al número relativamente alto de especies endémicas mexicanas que residen allí.

Background

The Sierra Madre Oriental is a mountainous system that extends from northeastern to southeastern Mexico, from near the boundary of the United States to middle Mexico. Several systems of regionalization based on different criteria have been applied to this province, so it, as with many other Mexican provinces, has been delimited and defined in different ways. The Sierra Madre Oriental range is situated on the eastern side of the

1. Laboratorio de Herpetología, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León, Apartado Postal 157, San Nicolás de los Garza, Nuevo León, N.L. C.P. 66450, México. imantodes52@hotmail.com (DL); liz_solis_1997@hotmail.com (MESB).

2. Laboratorio de Ornitología, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León. Ciudad Universitaria s/n. San Nicolás de los Garza, N.L., C.P. 66450, Mexico. juan_0305@hotmail.com (JASG).

3. Sistemas de Innovación y Desarrollo Ambiental S.C. Tepeyac No.159, Col. Churubusco, Monterrey Nuevo León, Mexico, C.P. 64590. javierbandaleal@hotmail.com (JBL).

4. Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana Zamorano, Departamento de Francisco Morazán, Honduras; 1350 Pelican Court, Homestead, Florida 33035, USA. bufodoc@aol.com (LDW).

5. Laboratorio de Ecología Molecular, Departamento de Ecología, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León, Ciudad Universitaria s/n. San Nicolás de los Garza, N.L., C.P. 66450, Mexico. sfavela@gmail.com (SFL); silvanapacheco14@gmail.com (SPT).

Mexican Plateau, and composed of shales and limestones. Often considered an extension of the Rocky Mountains, these mountains are divided by the Rio Grande, but continue on into New Mexico and western Texas. The range runs for roughly 1100 km from north to south before merging with the Cordillera Neo-Volcánica in east-central Mexico. The average elevations of this range are similar to those of the Sierra Madre Occidental, but some peaks rise above 3,650 masl. (Luna et al., 2004).

The Sierra Madre Oriental in the state of Nuevo León runs from NNW to SSE, and is formed by mountains ranges with intermontane valleys having elevations ranging from 800 to 1,500 masl. In the western region, there are elevations from 2000 to 2500 masl that in the south reach to over 3715 masl in San Antonio Peña Nevada, one of our study areas. The contrasting elevations, solar exposure, soil types, humidity retention capacity, and rain regimens determine the dominant vegetation composed primarily of mixed forest and submountain shrubs formation; in areas with strong slopes, high isolation, rocky soils, and extreme exposition, scrubby vegetation can be found. The distribution of dominant communities are established according to the humidity patterns; this is very obvious in localities with high precipitation like the municipality of Zaragoza. The floristic richness is composed of 111 families and more than 1064 species. This floristic diversity is considered to be the overlap of the Holarctic realm (Mountain Mesoamerican region) and the Neotropical realm (Xerophytic region) (Alanís-Flores, 2004). The forested area of the state of Nuevo León corresponds to 4,205,457.6 hectares—equivalent to 66.2% of the total area of the state (CONAFOR, 2017).

Mexican forests have great importance for the ecology and economy of the country. These ecosystems are characterized by a dominance of species of the genus *Pinus*. Pines play a very important role in the country's timber production; its wood is used for construction of homes and furniture. The resin of pine trees provides important chemical products. The pulp, too, is used in the manufacture of paper and cardboard (Farjon, 1996, Martínez-Antúnez et al., 2015). With regard to ecological importance, pine forests provide a wide range of environmental services. Forests are the main reservoirs of carbon, helping to decrease environmental pollutants. Forests also prevent erosion of mountains since they retain the soil; also, pine trees capture and filter water and provide shelter and feed wildlife with their seeds (Sánchez-González, 2008; Eckenwalder, 2009).

Mexico has the greatest diversity of pines in the world (Farjon, 1996; Farjon et al., 1997; Farjon and Filer, 2013), amounting to 42% of the world's species, 55% of which are considered endemic (Sánchez-González, 2008). In Mexico there are about 47 pine species. For Nuevo León, 15 species of the genus *Pinus* are recorded, representing 33% (Farjon et al., 1997) of the Mexican species (Figure 1).

In Nuevo León, as in the rest of the country, pine forests are found principally in mountainous areas with temperate to cold climates; in addition, some species can live in the foothills of mountains with dry or semi-dry climates (Estrada-Castillón et al., 2014). The latter pattern can be seen in some of our study areas, in localities with semi-dry climates with low annual precipitation between 2000 and 2600 m, on shallow and rocky soils, as for example in the Cañon Casa Blanca, Santa Catarina, where forests of pine nut producers called "pinyon" include species such as *Pinus cembroides*, *P. nelsoni* and *P. teocote*. In areas with higher elevations and warmer temperatures in southern Nuevo León, and along its borders with Tamaulipas, there are species such as *Pinus pseudostrobus* and *P. teocote*. Pine forests in the country are important plant communities providing food and shelter for many vertebrate groups. In this paper we document a few of these cases in Nuevo León.

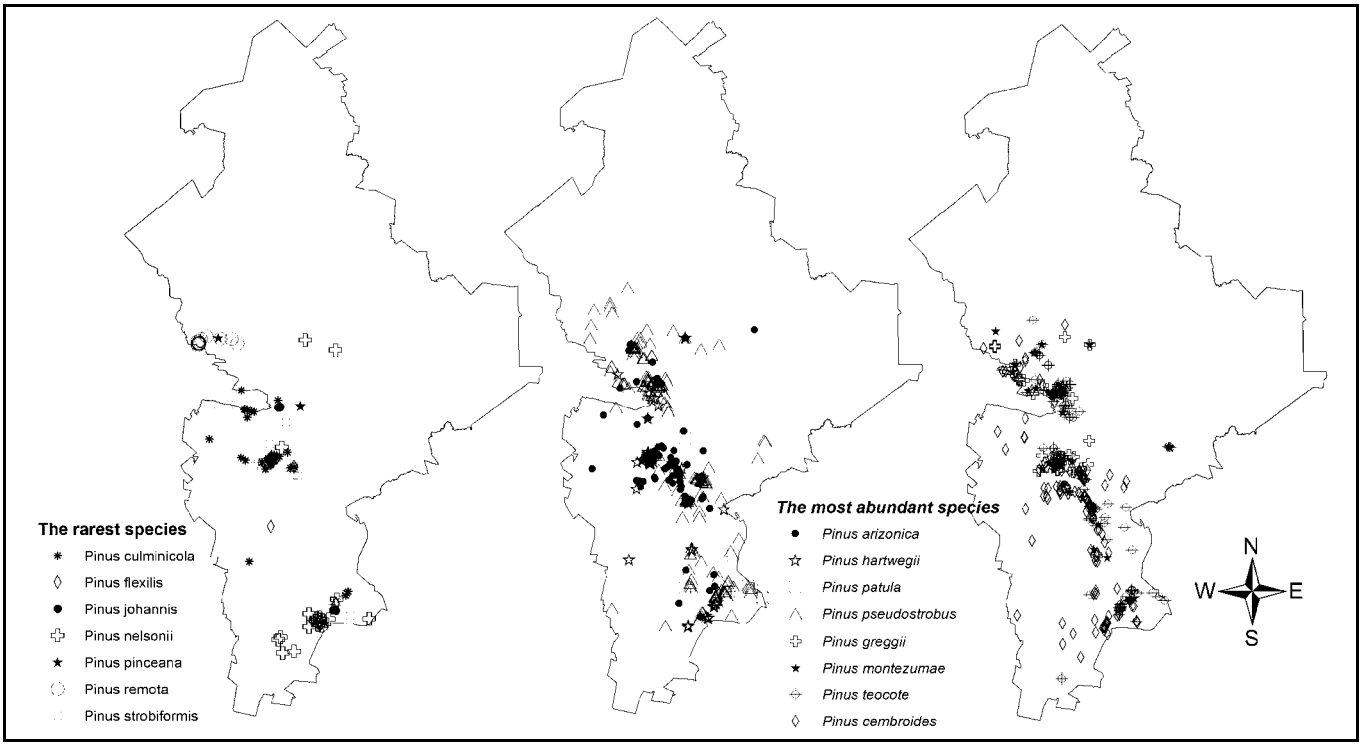


Figure 1. Distribution of species of *Pinus* in the Sierra Madre Oriental of Nuevo León, Mexico. Map courtesy of Silvana Pacheco-Treviño.

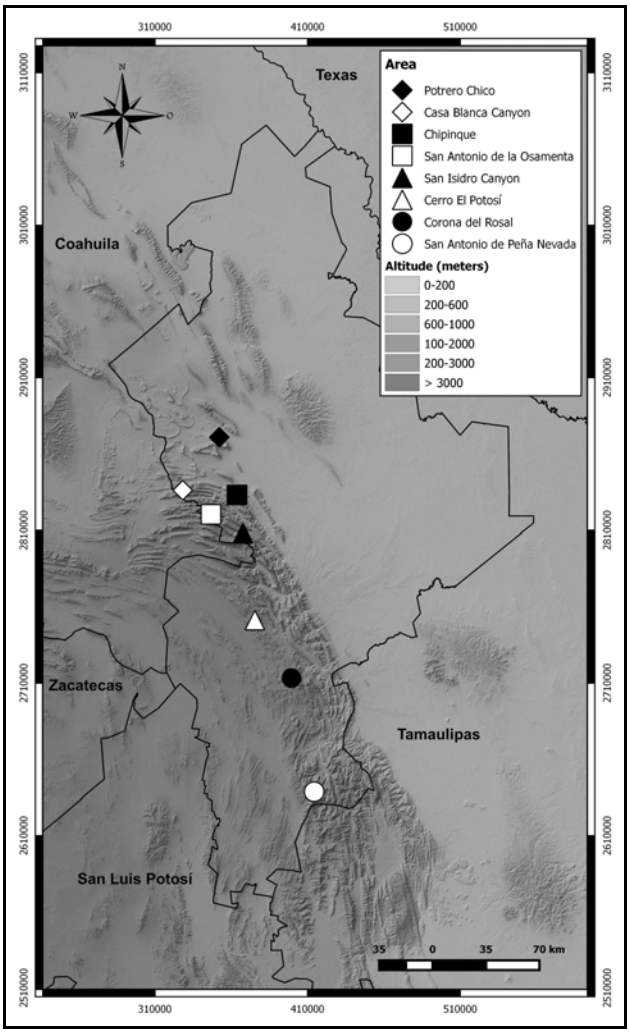


Figure 2. The nine pine forest study sites in the Sierra Madre Oriental of Nuevo León, Mexico. Map by Javier Banda-Leal..

Materials and Methods

Nine pine forest study sites (Figure 2) in the Sierra Madre Oriental of Nuevo León were sampled at varying times from 1996 through to the present, as follows:

1). Parque Ecológico Chipinque, San Pedro Garza García. We have been conducting observation transects from 1997 to the present. The pine forests here are composed of *Pinus pseudostrobus* and *P. teocote*.

2). San Antonio de la Osamenta, Santa Catarina. This site was visited recently in 2018 to document its herpetofauna. The site has the following pine species within it: *Pinus arizonica*, *P. cembroides, P. pseudostrobus*, *P. teocote*.

3). Cañon Potrero Chico, Hidalgo. This site received our attention in 2000, 2002, 2008, 2014, and 2016.We conducted transects in the *Pinus cembroides* and *P. pseudostrobus* communities**.**

4). Cañon de Casa Blanca, Santa Catarina. This site has received frequent visits from us since 2012. We conducted transects in the following pine communities: *Pinus cembroides*, *P. greggii*, *P. remota*.

5). Cañon de San Isidro, Santiago. We have been working at this site since 2002. We conducted transects in the following pine communities: *Pinus arizonica*, *P. cembroides*, *P. pseudostrobus, P. teocote*.

Pine-oak habitat in San Antonio de la Osamenta, Santa Catarina, Nuevo León. Photograph by: Miriam Elizabeth Solis-Barajas.

6). Ejido de Santa Rita, Galeana. This site has received our attention in 1996–1997, 2002, 2006, 2015 and 2016. We conducted transects in the *Pinus arizonica* and *P. cembroides* communities and co-existing plant communities. One interesting aspect of this site is the presence of various agave and yucca species on very rocky terrain.

7). Cerro del Potosí, Galeana. This site received our attention in 1996, 2004, 2007, 2014, 2016, and 2018. We conducted transects in the following pine communities: *Pinus cembroides, P. culminicola, P. hartwegii*, *P. pseudostrobus*.

8). Ejido Corona del Rosal, Galeana. This site also has received frequent visits since 1996, with trips during 2009, 2010, 2014, 2016, 2017, and 2018. We conducted transects in the *Pinus arizonica, P. cembroides, P. hartwegii* and *P. teocote* communities. One interesting aspect of this site is the presence of various agave species within in the pine forest community, increasing areas of cover for herpetofaunal species.

9). Sierra San Antonio Peña Nevada. We explored this site during 2002–2004; additional time was invested here during the following years. We conducted transects in the *Pinus arizonica,*

One of the canyons at San Antonio de la Osamenta, Santa Catarina, Nuevo León. Photograph by Miriam Elizabeth Solis-Barajas.

P. cembroides, P. hartwegii and *P. teocote* communities. One interesting aspect of this site is the presence of various agave species.

In this paper we document the composition of the herpetofauna found active in the different pine forest communities in the state of Nuevo León. At each of our study sites, we documented all sightings of herpetofaunal species. Our sightings were always done where pines were the dominant species, and coexisted with other plant communities. Pine communities with bare substrate showed little or no herpetofaunal activity. Activity increased with the presence of oaks, agaves or water bodies. See Table 1 for a list of the pine species present at each of the nine sites.

Descriptions of the Study Sites

Vegetational communities play an extremely important role in determining the distribution of animal species. Vegetation provides elements of habitat that animal species require, such as microclimate, refuge, and suitable areas for prey capture. The flora of Nuevo León is amazingly rich; records indicate the presence of about 2,903 species of vascular plants (INEGI, 1986; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Velazco-Macías, 2009; Velazco-Macías and Alanís-Flores, 2014). This floristic diversity plays an important role, along with humidity and elevation, in the distribution of many invertebrate and vertebrate animal species. Below we provide brief descriptions of the sites in the pine forests of Nuevo León at which we catalogued the resident herpetofauna.

1). Parque Ecológico Chipinque, Monterrey and San Pedro Garza García. Five vegetation types occur in this study site: submontane matorral, oak forest, oak-pine forest, pine-oak forest, and rosetophilous desert scrub. In the submontane matorral the following species are found: *Helietta parvifolia* (barreta / *barreta*), *Cordia boissieri* (Texas olive /*anacahuita*), *Pithecellobium pallens* (ape's earring / *tenaza*), *Acacia rigidula* (blackbrush acacia / *chaparro prieto*), *Acacia farnesiana* (sweet acacia / *huizache*), *Caesalpinia mexicana* (Mexican holdback / *poinciana*) and *Prosopis glandulosa* (honey mesquite / *mesquite dulce*). In the oak forest occur *Quercus canbyi* (Chisos oak / *roble rojo)*, *Q. laceyi* (Lacey oak / *encino laurelillo*), *Q. laeta* (white oak / *encino blanco*), *Q. polymorpha* (net-leaf white oak / *encino manzanero*), *Q. rhysophylla* (loquat leaf oak / *encino colorado*), *Q. virginiana* var. *fusiformis* (southern live oak / *encino del sur*), *Arbutus xalapensis* (Texas madrone / *madroño*), *Prunus serotina* (black cherry / *cerezo negro americano*) and *Juglans mollis* (Mexican walnut / *nogal encarselado*). In the pine forest are *Pinus pseudostrobus* (Monterrey pine / *pino lacio*) and *P. teocote* (Aztec pine / *pino colorado*). Normally, patches of oak-pine or pine-oak forest are present. The abrupt topography includes inclines ranging between 30 and 70%, with an elevational variation from 650 to 2260 masl. This ecological park is located within the Metropolitan Area of Monterrey in the municipalities of Monterrey and San Pedro Garza García (INEGI, 1986; Alanís-Flores, 2004; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Velazco-Macías, 2009; Velazco-Macías and Alanís-Flores, 2014).

Table 1. Herpetofaunal study sites in the Sierra Madre Oriental of Nuevo León, Mexico, with resident pine species. All altitudes given as meters above sea level.

Study site and altitude gradient for the area	Pine species and elevation range for the species
Parque Ecológico Chipinque (650–2260)	*Pinus pseudostrobus* (1300–2700)
	Pinus teocote (1000–2300)
San Antonio de la Osamenta (2000–3300)	*Pinus arizonica* (2000–2800)
	Pinus cembroides (1400–2400)
	Pinus pseudostrobus (1300–2700)
	Pinus teocote (1000–2300)
Cañon Potrero Chico (630–1200)	*Pinus cembroides* (1400–2400)
	Pinus pseudostrobus (1300–2700)
Cañon de Casa Blanca (1100–2500)	*Pinus cembroides* (1400–2400)
	Pinus greggi (2300–2700)
	Pinus remota (600–1700)
Cañon de San Isidro (1540–2300)	*Pinus arizonica* (2000–2800)
	Pinus pseudostrobus (1300–2700)
	Pinus teocote (1000–2300)
Ejido de Santa Rita (1550–2100)	*Pinus arizonica* (2000–2800)
	Pinus cembroides (1400–2400)
Cerro de Potosí (2200–3750)	*Pinus cembroides* (1400–2400)
	Pinus culminicola (1400–2400)
	Pinus hartwegii (2300–4300)
	Pinus pseudostrobus (1300–2700)
Ejido Corona de Rosal (2225–2570)	*Pinus arizonica* (2000–2800)
	Pinus cembroides (1400–2400)
	Pinus hartwegii (2300–4300)
	Pinus teocote (1000–2300)
Sierra San Antonio Peña Nevada (2200–3450)	*Pinus arizonica* (2000–2800)
	Pinus cembroides (1400–2400)
	Pinus hartwegii (2300–4300)
	Pinus teocote (1000–2300)

2). San Antonio de la Osamenta, Santa Catarina. This locality is found within Parque Nacional Cumbres de Monterrey, which is part of the Sierra Madre Oriental; its vegetational communities change with elevation, starting with rosetophilous desert scrub with predominant species in the upper stratum such as *Larrea tridentata* (Texas sage / *gobernadora*)*, Viguiera stenoloba* (skeleton-leaf goldeneye / *viguiera*)*, Citharexylum brachyanthum* (boxthorn fiddlewood / *vara dulce*)*, Fluorensia cernua* (American tarwort / *hojasén*)*, Mimosa malacophylla* (softleaf mimosa / *chascarrillo*)*, Acacia rigidula* (blackbush /*chaparro prieto*) and *Lantana macropoda*. We can sporadically find *Yucca treculeana* (Spanish dagger / *chascarrillo*). In the inferior stratum we find *Agave lechuguilla* (lechuguilla), *Guaiacum angustifolium* (Texas guaiacum / *guayacan*) and *Opuntia leptocaulis* (desert Christmas cactus / *tasajillo*). Piedmont scrub / submontane matorral vegetation contains the following species: *Acacia rigidula, A. berlandieri* (Berlandier's acacia / *guajillo*), *A.*

farnesiana, *A. wrightii* (catclaw acacia */ uña de gato), A. greggii* (devilclaw / *tesota*)*, Cordia boissieri*, *Cercidium macrum* (border paloverde / *paloverde*), *Prosopis glandulosa*, *Guaiacum angustifolium, Zanthoxylum fagara* (lime prickly-ash / *limoncillo*), *Condalia spathulata* (knifeleaf condalia / *crusillo*), *Celtis pallida* (desert hackberry /*acebuche*), *Aloysia gratissima* (whitebush / *vara dulce*), *Forestiera angustifolia* (Texas swamp-privet / *panalero*)*, Croton torreyanus* (woody croton / *croton*)*, Condalia hookeri* (Brazilian bluewood / *crusillo*), *Bouteloua trífida* (red grama / *navajita roja*), *Gymnosperma glutinosum* (gumhead / *tatalencho*), *Ambrosia psilostachya* (Cuman ragweed / *altamisa*), *Opuntia leptocaulis*, *Trichloris pluriflora* (little bluestem / *pasto crespo grande*)*, Aristida pansa* (Wooton's three-awn / *tres aristas perenne*), *Lantana macropoda*, *Karwinskia humboldtiana* (Humboldt's coyotillo / *coyotillo*) and *Ambrosia artemisiifolia* (common ragweed / *altamisa*). The pine forest here is dominated by the following species: *Abies vejarii* (Vejar fir /*abeto de Vejar*), *Pinus arizonica* (Arizona pine / *pino blanco*), *P. cembroides* (Mexican pinyon pine / *pino piñonero*)*, P. pseudostrobus*, *P. teocote*, *Juglans major* (Arizona walnut / *nogal cimarrón*), *Picea martinezii* (Martinez's spruce / *pinabete de Nuevo León*), *Yucca carnerosana* (giant Spanish dagger / *plama samandoca*)*, Arbutus xalapensis*, *Cupressus arizonica* (Arizona cypress / *ciprés de Arizona*), *Juniperus monosperma* (one-seed juniper / *cedro*) and *J. flaccida* (Mexican drooping juniper / *cedro colorado*). In some locations we also can find *Quercus laeta*. The pine-oak forest community is dominated by the following species: *Parthenocissus quinquefolia* (virgin ivy / *parra virgen*), *Pinus teocote*, and *P. pseudostrobus*. Also commonly found are *Arbutus xalapensis* and *Arbutus arizonica* (Arizona madrone / *madroño norteño)*. The oak community found here contains: *Quercus laceyi*, *Q. polymorpha* (netleaf white oak / *encino roble*), *Q. rhysophylla*, *Q. laeta, Q. mexicana* (Mexican oak / *encino tezahuatl*) and *Q. rugosa* (netleaf oak / *encino quebrado hacha*). The elevational gradient in this area is from 2,000 to 3,300 masl. This complex sierra is located about 21 km southeast of the center of the Monterrey Metropolitan Area (INEGI, 1986; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Velazco-Macías, 2009; Velazco-Macías and Alanís-Flores, 2014).

3). Cañon Potrero Chico, Hidalgo. This canyon is near the town of Hidalgo, in the municipality of Hidalgo. Here we found elements of piedmont scrub / submontane matorral vegetation on rocky limestone walls of the canyon, elements such as: *Cordia boisieri*, *Gochnatia hypoleuca* (shrubby bullseye / *ocotillo*), *Chilopsis linearis* (desert willow / *sauce del desierto*), *Sophora secundiflora* (Texas mountain laurel / *colorín*), *Hechtia glomerata* (guapilla / *guapilla*), *Helietta parvifolia*, *Diospyros texana* (Texas persimmon / *chapote*), *Acacia berlandieri*, *Leucophyllum frutescens* (white sage / *cenizo*), *Pithecellobium pallens*, *Agave scabra* (rough agave / *maguey bronco*), *Yucca filifera* (St. Peter's palm / *palma pinta*), *Tecoma stans* (yellow bell / *tronadora*), *Brahea berlandieri* (rock palm / *palma de las rocas*), *Agave bracteosa* (squid agave / *maguey huasteco*), *A. lechuguilla* and several globe-shaped cactus species: *Mammillaria melanocentra* (pincushion cactus / *biznaga de centrales negras*), *M. plumosa* (pincushion cactus / *biznaga plumosa*), *Ferocactus hamatacanthus* (barrel cactus / *biznaga costillona*). Also occurring are several *Echinocereus* species (hedgehog cacti) and *Dasylirion berlandieri* (blue giant sotol / *palma azul*). The pine forest community found here is composed of *Pinus pseudostrobus* and *P. teocote*. The elevational gradient in this area is from 630 to 1200 masl. The canyon is located about 35 km northwest of the center of the Monterrey Metropolitan Area (INEGI, 1986; Alanís-Flores, 2004; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Velazco-Macías, 2009; Velazco-Macía and Alanís-Flores, 2014).

4). Cañon de Casa Blanca, Santa Catarina. This canyon is located to the left of the federal highway #57 Monterrey-Saltillo, in the municipality of Santa Catarina. Rosetophilous and piedmont scrub / submontane matorral elements are present on the limestone walls at the entrance of this canyon. At the base of the canyon, we can find the following plant species: *Cordia boisieri*, *Gochnatia hypoleuca*, *Chilopsis linearis*, *Sophora secundiflora*, *Hechtia glomerata*, *Helietta parvifolia*, *Diospyros texana*, *Acacia berlandieri*, *Arbutus xalapensis*, *Leucophyllum frutescens*, *Pithecellobium pallens*, *Yucca filifera*, and isolated individuals of *Juniperus deppeana* (checkerbark juniper / *táscate*). On the limestone walls of the canyon, we found *Brahea berlandieri* and several cacti: *Epithelantha unguispina* (button cactus / *biznaga blanca chilona*), *Mammillaria melanocentra*, and *M. plumosa*. We also found common sotols and beargrasses including *Dasylirion berlandieri*, *D. cedrosanum* (Mexican grass tree / *sotol de la Sierra Madre*) and *Nolina cespitifera* (robust beargrass / *palmilla*), all forming ecotones with other plant communities such as pine forest. The pine forest includes *Pinus cembroides*, *P. greggii* (Gregg's pine / *pino prieto*), *P. nelsonii* (Nelson's pinyon pine / *piñonero colarado*), *P. pinceana* (Princes pinyon pine / *piñón rosa*), *P. remota* (Texas pinyon pine / *pino piñonero de Texas*) co-existing with various oak trees. The elevational gradient in this area is from 1,100 to 2,500 masl. The canyon is located about 41 km northwest of the center of the Monterrey Metropolitan Area (INEGI, 1986; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Velazco-Macías, 2009; Velazco-Macías and Alanís-Flores, 2014).

5). Cañon de San Isidro, Santiago. This canyon is located in that portion of the Sierra Madre Occidental known as the Curvature of Monterrey, within the Parque Nacional Cumbres de Monterrey in the municipality of Santiago. The canyon is located southwest of the municipality and is contiguous with the state of Coahuila. The canyon is approximately 2 km in length, at 1600 masl with limestone walls that are about 400 m in height. The vegetation along the stream is a gallery forest, with piedmont scrub/submontane matorral and an oak forest community. On the canyon's rocky walls we found rosetophilous scrub, with xerophilous plant species. The canyon floor mainly contains piedmont scrub floristic elements, such as *Helietta parvifolia*, *Chilopsis linearis*, *Cercis canadensis* (eastern redbud / *árbol de Judas*), *Gochnatia hypoleuca*, *Acacia rigidula*, *A. farnesiana*, *A. berlandieri*, *Sargentia greggii* (yellow chapote / *chapote amarillo*), *Arbutus xalapensis*, and several oak species such as *Quercus cambyi* and *Q. fusiformis*. There is a gallery forest distinguished by *Platanus occidentalis* (American syca-

A mixture of pine forest, agaves, and oak trees in Cerro de Potosí, Galeana, Nuevo León. Photograph by David Lazcano

more / *alamo*) throughout the canyon. Important sotols and beargrasses are *Dasylirion berlandieri*, *D. cedrosanum* and *Nolina cespitifera*, forming ecotones with other plant communities, such as pine forest. At higher elevations, the vegetation grades from oak to pine forest with the following species: *Pinus arizonica*, *P. pseudostrobus* and *P. teocote*. The elevational gradient in this area is from 1,540 to 2,300 masl. The canyon is located about 41 km west of the center of the Monterrey Metropolitan Area (INEGI, 1986; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Velazco-Macías, 2009; Velazco-Macías and Alanís-Flores, 2014).

6). Ejido de Santa Rita, Galeana. In the flat portion of this *ejido* (a communal piece of land), we found patches of *Sophora secundiflora*, dispersed individuals of *Yucca filifera*, and some herbaceous plants such as grasses and globular cacti (*Coryphantha* sp., *Turbinicarpus beguinii*, *Mammillaria* sp.). There are also some low hillsides with steep slopes, as well as the canyons formed by streams, where limestone and chalky soils are present. On these slopes, we normally find piedmont scrub /submontane matorral and rosetophilous scrub vegetation. The species present here include *Tecoma stans*, *Hechtia glomerata*, *Echinocactus platyacanthus* (giant barrel cactus / *biznaga burra*), *Ferocactus hamatacanthus*, and other cacti (*Neolloydia* sp., *Turbinicarpus* sp., *Thelocactus* sp.); important sotols and beargrasses include *Dasylirion berlandieri*, *D. cedrosanum* and *Nolina cespitifera*. Here the pine community is composed of *Pinus arizonica* and *P. cembroides*. The elevational gradient in this area is from 1,550 to 2,100 masl. The site is located about 138 km south of the center of the Monterrey Metropolitan Area (INEGI, 1986; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Velazco-Macías, 2009; Velazco-Macías and Alanís-Flores, 2014).

7). Cerro de Potosí, Galeana. Cerro El Potosí is part of the Sierra Madre Oriental and is located in the south-central of the state of Nuevo León 15 km west of the municipal capital, which is Galeana (García-Arévalo and González-Elizondo, 1991). Following the criteria of García-Arana (1996), we can find the following vegetation types across an elevational gradient: piedmont scrub /submontane matorral of *Quercus intricata* (dwarf oak / *encino enano*) between 2000 and 2200 masl that is also associated with agricultural areas; the pine forest communities are represented by *Pinus cembroides*, *P. culminicola* (Cerro

A mixture of pine forest, agaves and oak trees in Ejido Corona del Rosal, Pablillo, Galeana, Nuevo León. Photograph by David Lazcano.

Potosí pinyon / *piñón enano*), *P. hartwegii* (Hartweg's pine / *ocote blanco*), *Pseudotsuga menziesii* (Douglas fir / *ayarín*) and *P. pseudostrobus*. In the subalpine area, between 3600 and 3715 masl, we can find *Pinus culminicola*, *Potentilla leonina* (barren strawberries / *falsa rosa del Cerro Potosí*), *Arenaria* sp. (sandwort / *césped espinoso*), *Astragalus purpusii* (milkvetch / *gusanillo*) and *Hymenoxys insignis* (butterweed / *girasol*). Along the different elevational gradients we also find *Acacia greggii*, *Arbutus xalapensis*, *Berberis trifoliolata* (Mexican barberry / *agarita)*, *Cowania plicata* (antelope bush / *rosa silvestre*), *Quercus mexicana* and *Rhus virens* (evergreen sumac / *capulín*). The elevational gradient in this area is from 2,000 to 3,750 masl. The site is located about 152 km south of the center of the Monterrey Metropolitan Area (García-Arévalo and González-Elizondo, 1991; García-Arana, 1996; Villarreal-Quintanilla, 2007; Alanís-Flores, 2004; Villarreal-Quintanilla and Estrada Castillón, 2008).

8). Ejido Corona del Rosal, Pablillo, Galeana. This area is located in the municipality of Galeana, Nuevo León. In areas with less humidity are various scrub species such as *Berberis trifoliolata*, *Juniperus erythrocarpa* (redberry juniper / *tascate*), *Rhammus* sp. (little buckthorn / *abrojo*), and *Rhus trilobata* (fragrant sumac / *agrito*). Higher altitudes support an oak-pine community of *Quercus greggii*, *Q. affinis* (Mexican oak / *encino asta*), *Q. hypoxantha*, *Q. crassifolia* (Mexican leatherleaf oak / *encino blanco*), *Arbutus xalapensis*, *Agave montana* (mountain agave / *maguey de montaña*) and *A. gentryi* (green agave / *maguey verde*), along with pine species such as *Pinus arizonica*, *P. cembroides* and *P. pseudostrobus*. The elevational gradient in this area is from 2225 to 2570 masl. The site is about 188 km south of the center of the Monterrey Metropolitan Area (INEGI, 1986; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Velazco-Macías, 2009; Velazco-Macías and Alanís-Flores, 2014).

9). Sierra San Antonio Peña Nevada, Zaragoza. This area is in the southwestern portion of the state, part of the much larger mountainous area of the Sierra Madre Oriental, 30% of which lies within the municipality of Zaragoza in Nuevo León and 70% within the municipality of Miquihuana in Tamaulipas. This sierra encompasses 605 km^2 within the municipality of Zaragoza in Nuevo León; it occupies approximately 209.5 km^2 of sierras and canyons. This area is now considered part of the National System of Priority Areas RTP-86 (Arriaga et al. 2000). The lower parts of the montane landscape is dominated by a desert

A *Gerrhonotus infernalis* found active in a mixture of pine forest, agaves, and oak trees in San Antonio de la Osamenta, Santa Catarina, Nuevo León. Photograph by David Lazcano.

A *Chiropterotriton priscus* found under pine bark in San Antonio de la Osamenta, Santa Catarina, Nuevo León. Photograph by David Lazcano.

A *Phrynosoma orbiculare* found among pine needles in San Antonio de la Osamenta, Santa Catarina, Nuevo León. Photograph by Miriam Elizabeth Solis-Barajas.

A *Pituophis deppei* found in a mixture of pine forest, agaves and oak trees in San Antonio de la Osamenta, Santa Catarina, Nuevo León. Photograph by Michael S. Price.

An *Aquiloeurycea galeanae* found in a mixture of pine forest, agaves, and oak trees in Cerro Potosi, Galeana, Nuevo León. Photograph by Jorge Armando Contreras-Lozano

A *Barisia imbricata* found in the mixture of pine forest, agaves and oak trees in Ejido Corona del Rosal, Pablillo, Galeana, Nuevo León. Photograph by David Lazcano.

A *Plestiodon dicei* found under pine bark in Ejido de Santa Rita, Galeana, Nuevo León. Photograph by David Lazcano.

scrub rosetophilous and piedmont scrub/submontane matorral, a transitional community of plant species such as *Nolina hibernica* (siberica / *sollate de la siberial*), *Agave gentryi*, *Opuntia robusta* (silver dollar prickly pear / *nopal camueso*), *Juniperus flaccida*, *Buddleja cordata* (tepozan / *tepozán blanco*) and *Cylindropuntia leptocaulis* (Christmas cactus / *tasajillo*). In portions of middle mountain around at 2200 m there is a chaparral community of oak forests with species such as: *Agave asperrima* (rough agave / *maguey cenizo*), *Sophora secundiflora*, *Quercus mexicana*, *Q. greggii*, *Q. emoryi*, *Pinus arizonica*, *P. cembroides*, *Pseudotsuga menziesii* and *Prunus serotina*. The higher elevations of the sierra are dominated by pine forest community with the following plant species: *Pinus cembroides*, *P. nelsonii*, and other conifers such as *Pseudotsuga menziesii* and *Abies vejarii*, which are accompanied by other species such as *Tillandsia recurvata* (ball moss / *gatillos*), *Sophora secundiflora*, and *Quercus saltillensis* (*encino de saltillo*). There are extensive areas with *Arbutus xalapensis*, *Pinus arizonica*, *P. hartweggii*, and *P. teocote*. The elevational gradient in this area is from 2200 to 3450 masl. The complex sierra is located about 217 km southeast of the center of the Monterrey Metropolitan Area (Treviño-Garza, 1984; INEGI, 1986; Villarreal-Quintanilla, 2007; Villarreal-Quintanilla and Estrada Castillón, 2008; Moreno-Talamantes and García-Aranda, 2012; Velazco-Macías, 2009; Velazco-Macías and Alanís-Flores, 2014).

Pine Forest Herpetofauna of Nuevo León

The herpetofauna we have documented as occupying the pine forests of that portion of the Sierra Madre Oriental within Nuevo León amounts to 34 species, including two anurans, two salamanders, 15 lizards, and 15 snakes (Table 2). The total figure constitutes 24.5% of the state total of 139 species (Nevárez-de los Reyes et al., 2016). The two anurans in pine forests represent 9.1% of the 22 species in the entire state, the two salamanders 50.0% of the four total, the 15 lizards 36.6% of the 41 total, and the 15 snakes 23.1%% of the 65 total. None of the seven species of turtles recorded from the state have been found within the state's pine forests. No other herpetofaunal groups are represented in Nuevo León (Nevárez-de los Reyes et al., 2016).

Distribution of Herpetofaunal Species among the Nine Sites

The number of herpetofaunal species recorded in the nine assessed pine forest sites in Nuevo León ranged from five to 14 ($\bar{x}$ = 8.6). The largest numbers of species were recorded from sites 1, 2 and 8 (Table 2). Each individual species was present at from one to seven of the sites ($\bar{x}$ = 2.3), indicating that most species have relatively limited distributions within the state's pine forests. The most widespread species among the major groups (Table 2) are *Eleutherodactylus cystignathoides* among the anurans (four sites), *Chiropterotriton priscus* among the salamanders (three sites), *Plestiodon dicei* among the lizards (seven sites), and *Crotalus molossus* among the snakes (six sites).

Distributional Categorization

The 34 species comprising the Nuevo León pine forest herpetofauna are placed in three of the six distributional categories established by Wilson et al. (2007) applicable to Mexico (Table 3). These categories are the MXEN, containing species endemic to Mexico, MXUS, comprising species occurring only in Mexico and the United States, and MXCA, consisting of species occurring only in Mexico and Central America. Only a single species, the snake *Tantilla rubra*, is allocated to the MXCA category. Of the remaining 33 species, 17 are MXEN species and 16 are MXUS species (Table 3). The proportion of MXEN species in Nuevo León's pine forest herpetofauna (50.0%) is higher than that for the state's native herpetofauna as a whole (40 of 135 species or 29.6%; Nevárez-de los Reyes et al. 2016).

Conservation Status of the Pine Forest Herpetofauna

We employed three systems of conservation categorization, including the Mexican national SEMARNAT, the international IUCN system, and the regional EVS system, and recorded the results in Table 3.

The SEMARNAT system is widely used in herpetological studies undertaken by Mexican nationals, but less so by foreign nationals. The categories employed in this system are as follows: P = Endangered; A = Threatened; and Pr = Special Protection. We designate those species not assessed by this system as No Status (NS). The data in Table 2 indicate that 18 of the 34 species (52.9%) have not been assessed. The remaining 16 species are assessed as follows: A (6 or 17.6% of total) and Pr (10 or 29.4%). The Threatened species (A) are the following: *Aquiloeurycea galeanae*; *Phrynosoma orbiculare*; *Sceloporus ornatus*; *Lampropeltis mexicana*; *Pituophis deppei*; and *Thamnophis exsul*. All but one of these six species are Mexican endemics; the exception is *P. deppei*, which is a MXUS species.

The IUCN system is used across the globe, but is beset by a number of deficiencies (Johnson et al., 2015). This system utilizes the following categories: CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern; DD = Data Deficient; and NE = Not Evaluated. The data in Table 2 indicate the following assessments: EN (two species or 5.9%); NT (three species or 8.8%); LC (26 species or 76.5%); and NE (three species or 8.8%). One of the deficiencies of the IUCN system of conservation assessment is its over-reliance on the use of the LC category. In this instance, more than three-quarters of the pine forest species are allocated to this category. We feel that the EVS system discussed immediately below offers a more accurate assessment of the conservation status of these 34 species.

The species accounts at the IUCN website also provide estimates of population status, based on the following system: U = Unknown; S = Stable; D = Decreasing; I = Increasing; N = Not Evaluated. We placed the available data in Table 3. These data indicate that the 34 pine forest species are allocated to these categories in the following fashion: U (four species); S (24 species); D (three species); I (0 species); N (three species). According to these evaluations, the majority of the pine forest species (24 of 34 or 70.6%) have populations that are stable. Only three species (12.5%) have declining populations. These species are *Aquiloeurycea galeanae*, *Gerrhonotus parvus* and *Sceloporus chaneyi*; all three are Mexican endemics, but make up only 17.6% of the 17 MXEN species. It is our opinion that

Table 2. Distribution of the amphibians, and reptiles of the pine forests of Nuevo León, by study site: 1 = Parque Ecológico Chipinque; 2 = San Antonio de la Osamenta; 3 = Cañon Potrero Chico; 4 = Cañon de Casa Blanca; 5 = Cañon de San Isidro; 6 = Ejido de Santa Rosa; 7 = Cerro del Potosí; 8 = Ejido Corona del Rosal; 9 = Sierra San Antonio Peña Nevada. See text for descriptions of the study sites.

	Study sites									# of sites at which species was found
Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Craugastor augusti	+									**1**
Eleutherodactylus cystignathoides	+				+	+		+		**4**
Aquiloeurycea galeanae							+			**1**
Chiropterotriton priscus		+					+		+	**3**
Barisia imbricata		+					+	+	+	**4**
Gerrhonotus infernalis	+	+	+	+	+					**5**
Gerrhonotus parvus					+	+				**2**
Phrynosoma orbiculare		+								**1**
Sceloporus chaneyi								+		**1**
Sceloporus couchii			+		+					**2**
Sceloporus cyanogenys	+									**1**
Sceloporus grammicus	+	+		+			+	+	+	**6**
Sceloporus minor								+		**1**
Sceloporus olivaceus	+									**1**
Sceloporus ornatus		+			+					**2**
Sceloporus parvus		+	+	+	+					**4**
Sceloporus poinsettii		+								**1**
Sceloporus torquatus		+						+		**2**
Plestiodon dicei	+	+	+	+			+	+	+	**7**
Lampropeltis mexicana						+				**1**
Masticophis schotti		+								**1**
Pantherophis bairdi	+									**1**
Pituophis deppei		+								**1**
Salvadora grahamiae						+				**1**
Tantilla rubra		+								**1**
Micrurus tener	+									**1**
Thamnophis exsul								+		**1**
Thamnophis pulchrilatus								+		**1**
Crotalus atrox	+		+	+						**3**
Crotalus lepidus			+	+	+					**3**
Crotalus molossus	+	+	+	+	+				+	**6**
Crotalus morulus	+							+	+	**3**
Crotalus pricei							+	+	+	**3**
Crotalus scutulatus						+				**1**
Total number of species found	**12**	**14**	**7**	**7**	**8**	**5**	**6**	**11**	**7**	

the population status of all the pine forest species needs to be reevaluated.

The EVS system has been employed in several recent broad-based studies of the Mexican and Central America herpeto-faunas (Wilson et al., 2013a, b; Johnson et al., 2015, 2017; Mata-Silva et al., 2019), as well as the Mexican Conservation Series entry on the herpetofauna of Nuevo León (Nevárez-de los Reyes et al., 2016). The rating range from a low of 3 to a high of 20; these ratings are placed in three categories, i.e., low (scores of 3–9, medium (scores of 10–13, and high (scores of 14–20). The data in Table 2 demonstrate that the 34 pine-oak species are

Table 3. Herpetofaunal species of pine forests of Sierra Madre Oriental of Nuevo León, Mexico, and their distribution and conservation status, based on the SEMARNAT, IUCN, and EVS systems. Distributional categories: MXEN = species endemic to Mexico; MXUS = species distributed only in Mexico and the United States; MXCA = species distributed only in Mexico and Central America. SEMARNAT status: A = Threatened; Pr = Special Protection; NL=Not Listed; NS = No status. IUCN categorizations: EN = Endangered; NT = Near Threatened; LC = Least Concern; NE = Not Evaluated. IUCN Population Trend: U = Unknown; S = Stable; D = Decreasing; N = Not evaluated. Environmental Vulnerability Score and Category: 3–9 = Low; 10–13 = Medium; 14–20 = High.

Taxon	Distribution	SEMARNAT status	IUCN		EVS
			Protection status	Population trend	
Craugastor augusti	MXUS	NS	LC	S	L(8)
Eleutherodactylus cystignathoides	MXUS	NS	LC	S	M(12)
Aquiloeurycea galeanae	MXEN	A	V	D	H(18)
Chiropterotriton priscus	MXEN	Pr	NT	S	H(16)
Barisia imbricata	MXEN	NL	LC	U	H(15)
Gerrhonotus infernalis	MXUS	NS	LC	S	M(13)
Gerrhonotus parvus	MXEN	Pr	EN	D	H(17)
Phrynosoma orbiculare	MXEN	A	LC	S	M(12)
Sceloporus chaneyi	MXEN	NS	EN	D	H(15)
Sceloporus couchii	MXEN	NS	LC	S	H(15)
Sceloporus cyanogenys	MXUS	NS	NE	N	M(13)
Sceloporus grammicus	MXUS	Pr	LC	S	L(9)
Sceloporus minor	MXEN	NS	LC	S	H(14)
Sceloporus olivaceus	MXUS	NS	LC	S	M(13)
Sceloporus ornatus	MXEN	A	NT	U	H(16)
Sceloporus parvus	MXEN	NS	LC	S	H(15)
Sceloporus poinsettii	MXUS	NS	LC	S	M(12)
Sceloporus torquatus	MXEN	NS	LC	S	M(11)
Plestiodon dicei	MXEN	NS	NE	N	M(12)
Lampropeltis mexicana	MXEN	A	LC	S	H(15)
Masticophis schotti	MXUS	NS	LC	S	M(13)
Pantherophis bairdi	MXUS	NS	LC	S	H(15)
Pituophis deppei	MXEN	A	LC	S	H(14)
Salvadora grahamiae	MXUS	NS	LC	S	M(10)
Tantilla rubra	MXCA	Pr	LC	U	L(5)
Micrurus tener	MXUS	NS	LC	S	M(11)
Thamnophis exsul	MXEN	A	LC	S	H(16)
Thamnophis pulchrilatus	MXEN	NS	LC	U	H(15)
Crotalus atrox	MXUS	Pr	LC	S	L(9)
Crotalus lepidus	MXUS	Pr	LC	S	M(12)
Crotalus molossus	MXUS	Pr	LC	S	L(8)
Crotalus morulus	MXEN	NS	NE	N	H(16)
Crotalus pricei	MXUS	Pr	LC	S	H(14)
Crotalus scutulatus	MXUS	Pr	LC	S	M(11)

judged to have the following numerical ratings: 5 (one species or 2.9%); 8 (two species or 5.9%); 9 (two species or 5.9%); 10 (one species or 2.9%); 11 (three species or 8.8%); 12 (five species or 14.7%); 13 (four species or 11.8%); 14 (four species or 11.8%); 15 (six species or 17.6%); 16 (four species or 11.8%); 17 (one species or 2.9%); and 18 (one species or 2.9%). These ratings fall into the three categorizations as follow: low (five species or 14.7%); medium (13 species or 38.2%); and high (16 species or 47.1%). The relationship of these categorizations to the distributional categorizations is as follows: the low EVS species include four MXUS species and the one MXCA; the medium EVS species encompass 10 MXUS species and three MXEN species; the high EVS species are all MXEN species, except for two (*Pantherophis bairdi* and *Crotalus pricei*) that are MXUS species. Thus, it is evident that the most vulnerable species inhabiting the pine forests of the Sierra Madre Oriental in Nuevo León are principally species endemic to Mexico (14 of 34 species or 41.2%). The remaining three MXEN species (*Phrynosoma orbiculare*, *Sceloporus torquatus*, and *Plestiodon dicei*) are medium vulnerability EVS species, with numerical scores of 12, 11, and 12, respectively.

Comparion of this Study's Results with those of Canseco-Márquez et al. (2004)

Canseco-Márquez et al. (2004) assessed the herpetofauna inhabiting the entirety of the Sierra Madre Oriental (SMO) published as a chapter within the massive study of this impressive mountain range in eastern Mexico (Luna et al., 2004). Canseco-Márquez et al. (2004) reported a total of 207 species from the SMO, including 44 anurans, 20 salamanders, 49 lizards, and 88 snakes. Canseco-Márquez et al. (2004) recognized 11 types of vegetation in this range, one of which is the pine forest type. They recorded 43 species from this vegetation type (summed as 42 in their Appendix 1), including five anurans, six salamanders, 16 lizards, and 16 snakes. Of these 43 species, 11 are recorded in our study. The 32 species *Hyla eximia* (= *Dryophytes eximius*)*, *H.* (= *Rheohyla*) *miotympanum*, *H. plicata* (= *Dryophytes plicatus*)*, *Rana* (= *Lithobates*) *berlandieri*, *Ambystoma velasci*, *Bolitoglossa platydactyla**, *Chiropterotriton terrestris**, *Pseudoeurycea* (= *Aquiloeurycea*) *cephalica**, *Abronia taeniata**, *Sceloporus aeneus**, *S. bicanthalis**, *S. goldmani*, *S. scalaris**, *S. samcolemani*, *Eumeces* (= *Plestiodon*) *brevirostris**, *Eumeces* (= *Plestiodon*) *lynxe**, *Scincella gemmingeri**, *Lepidophyma gaigeae**, *Conopsis lineata**, *Diadophis punctatus*, *Ficimia hardyi**, *Geophis latifrontalis**, *G. mutitorques**, *Lampropeltis triangulum* (= *annulata*), *Leptodeira septentrionalis*, *Rhadinaea gaigeae**, *R. montana*, *Storeria dekayi*, *Thamnophis eques*, *T. scalaris**, *T. sumichrasti**, and *Crotalus aquilus** are not recorded in our study; those 21 species marked with an asterisk are not recorded from Nuevo León (Nevárez-de los Reyes et al., 2016). In addition, we record the following species in our study not reported by Canseco-Márquez et al. (2004) from SMO pine forests: *Eleutherodactylus cystignathoides**, *Gerrhonotus infernalis**, *Phrynosoma orbiculare**, *Sceloporus chaneyi**, *S. couchii*, *S. cyanogenys*, *S. olivaceus**, *S. parvus**, *S. poinsettii*, *Plestiodon dicei*, *Lampropeltis mexicana**, *Masticophis schotti**, *Pantherophis bairdi**, *Salvadora grahamiae*, *Tantilla rubra**, *Thamnophis exsul**, *T. pulchrilatus**, *Crotalus atrox*, *C. lepidus**, *C. molossus**, *C. morulus*, *C. pricei** and *C. scutulatus**. The 16 species indicated by asterisks, however, are recorded by Canseco-Márquez et al. (2004) from other vegetation types in the SMO.

Comparison of this Study's Results with those of McCranie and Wilson (1987)

Another important montane region in Mexico supporting pine forests (in actuality pine-oak forests) is the Sierra Madre Occidental, an elongate range extending from northeastern Sonora and northwestern Chihuahua to southwestern Zacatecas, northeastern Nayarit and northern Jalisco (McCranie and Wilson, 1987). McCranie and Wilson (1987) reported 86 herpetofaunal species, including 17 anurans, three salamanders, 27 lizards, 36 snakes, and three turtles. It is expected that more species would be resident in the pine-oak forests of the Sierra Madre Occidental than in the pine forest of the Sierra Madre Oriental of Nuevo León, if for no other reason than the region studied by McCranie and Wilson (1987) encompassed about 1,100 km from north to south as opposed to the approximately 243 km in the region studied for this paper. Twelve of the 34 species reported in our study also are recorded in the McCranie and Wilson (1987) paper from the Sierra Madre Occidental. These species are *Barisia imbricata*, *Phrynosoma orbiculare*, *Sceloporus grammicus*, *S. poinsettii*, *S. torquatus*, *Pituophis deppei*, *Salvadora grahamiae*, *Crotalus lepidus*, *C. molossus*, *C. scutulatus* and *C. pricei*. The *Lampropeltis mexicana* reported by McCranie and Wilson (1987) is currently considered as *L. greeri*, another member of the *mexicana* group (Hansen and Salmon, 2017).

Summary

1. The Sierra Madre Oriental (SMO) is a montane region that extends from Nuevo León and Coahuila in northeastern Mexico to central Puebla in east-central Mexico, with elevations ranging upward to 3,175 masl.

2. The SMO is an area of significant floristic diversity, among which the gymnosperm trees of the genus *Pinus* are especially important, both in terms of the ecosystem services they provide and the economic value they contribute.

3. The pine forests of the SMO in Nuevo León are made up of 15 species of *Pinus*, comprising 33% of the roughly 47 species found in Mexico.

4. Our study of the pine forest herpetofauna of Nuevo León is based on nine study sites located along the length of the SMO in the state.

5. The herpetofauna of the pine forests in the SMO of Nuevo León comprises 34 species, including two anurans, two salamanders, 15 lizards and 15 snakes, which is about a quarter of the entire state herpetofauna.

6. From five to 12 species were recorded at each of the nine pine forest study sites. Most of the species recorded from these sites have relatively limited distributions within these forests. The most widespread of the species recorded are *Eleutherodactylus cystignathoides* among the anurans, *Chiropterotriton priscus* among the salamanders, *Plestiodon dicei* among the lizards, and *Crotalus molossus* among the snakes.

7. Of the 34 pine forest species reported in this paper, 17 are MXEN species, 16 are MXUS species, and one is an MXCA species. Endemic species make up a much greater proportion of the total species in these forests than is the case in the state as a whole.

8. Based on the SEMARNAT system of conservation assessment, six species are classed as Threatened and 10 rated Special Protection, with 18 remaining unassessed.

9. Using the IUCN system, two species are assessed as EN, three as NT, 26 as LC, and three as NE.

10. Estimations of population status provided by the IUCN demonstrate the following assignments: unknown (four species); stable (24 species); decreasing (three species); and not evaluated (three species).

11. Employment of the EVS system demonstrates that five species fall into the low vulnerability category, 13 in the medium category, and 16 in the high category. Of the five low

category species, four are MXUS species and one an MXCA species; of the 13 medium category species, 10 are MXUS species and three are MXEN species; of the 16 high category species, 14 are MXEN species and two are MXUS species.

12. Of the species recorded from pine forests in the entire SMO in the (Canseco-Márquez et al. 2004) study, some are recorded in our study and some are not, as well as vice versa.

13. Of the 86 species reported from the Sierra Madre Occidental by McCranie and Wilson, 1987 only 12 species also are distributed in the Nuevo León segment of the Sierra Madre Oriental.

We conducted the fieldwork for this paper from 1997 through 2018. During that period of time, we recorded a total of 34 herpetofaunal species from forests dominated by species of *Pinus*, amounting to about a quarter of the species reported from the entire state. These forests constitute an important refuge for endemic Mexican species in an environment that provides important ecosystem services to these and numerous other creatures. Given the economic uses to which these forests are put, it is important to safeguard a future for them and their constituent herpetofaunas. Thus, protection of these forests has to be a major concern for conservation biologists, as well as for people in general. Continued degradation of these forests constitutes a major environmental issue for the present and future population of the state of Nuevo León. We recommend continued survey and monitoring of the populations of the herpetofauna of these forests and their inclusion in management plans for forest preservation.

Acknowledgments

We wish to thank the various governmental and non-government organizations for supporting our research throughout the years. We would also like to thank our herpetological students for their work in the field and laboratory. Research was conducted and collecting permits were issued to David Lazcano under the authorization of SEMARNAT during all these years.

Literature Cited

Alanís-Flores, G. J. 2004. Florística de Nuevo León. Pp. 243-258. *In*: I. Luna, J. J. Morrone and D. Espinoza, editors, Biodiversidad de la Sierra Madre Oriental. México, D.F.: Las Prensas de Ciencias.

Canseco-Márquez, L., F. Mendoza-Quijano and G. Gutiérrez-Mayen. 2004. Análisis de la distribución de la herpetofauna. Pp. 417-437. *In*: I. Luna, J. J. Morrone and D. Espinoza, editors, Biodiversidad de la Sierra Madre Oriental. México, D.F.: Las Prensas de Ciencias.

CONAFOR (Comisión Nacional Forestal). 2017. Inventario nacional forestal y de suelos: Informe de resultados 2009-2014. Zapopan, Jalisco, Mexico: Comisión Nacional Forestal.

Eckenwalder, J. E. 2009. Conifers of the world: The complete reference. Portland, Oregon: Timber Press.

Estrada-Castillón, A. E.; J. Á. Villarreal-Quintanilla, M. M. Salinas-Rodríguez, C. M. Cantú-Ayala, H. González-Rodríguez and J. Jiménez Pérez. 2014. Coníferas de Nuevo León, México. Linares: Universidad Autónoma de Nuevo León.

Farjon, A. 1996. Biodiversity of *Pinus* (Pinaceae) in Mexico: Speciation and palaeo-endemism. Botanical Journal of the Linnean Society 121(4):365-384.

Farjon, A., and D. Filer. 2013. An atlas of the world's conifers: An analysis of their distribution, biogeography, diversity, and conservation status. Leiden, Netherlands: Brill Academic Publications.

Farjon, A., J. A. Perez de la Rosa and B. T. Styles. 1997. A field guide to the pines of Mexico and Central America. London: Royal Botanical Gardens, Kew.

García-Arana, M. A. 1996. Análisis de la cubierta vegetal y propuesta para la zonificación ecológica del Cerro El Potosí, Galeana, Nuevo León, México. Universidad Autónoma de Nuevo León, Facultad de Ciencias Forestales. Unpublished thesis.

García-Arévalo, A., and S. González-Elizondo. 1991. Flora y vegetación de la cima del Cerro Potosí, Nuevo León, México. Acta Botánica Mexicana 13:53-74.

Hansen, R. W., and G. T. Salmon. 2017. Distribution analysis, taxonomic updates, and conservation status of the *Lampropeltis mexicana* group (Serpentes: Colubridae). Mesoamerican Herpetology 4(4):700–758.

INEGI. 1986. Síntesis geográfica del estado de Nuevo León. Mexico, D.F.: Instituto Nacional de Estadística, Geografía E Informática.

Johnson, J. D., V. Mata-Silva and L. D. Wilson. 2015. A conservation assessment of the Central American herpetofauna based on the EVS measure. Amphibian and Reptile Conservation 9(2):1-94 (e100).

Johnson, J. D., L. D. Wilson, V. Mata-Silva, E. García-Padilla and D. L. DeSantis. 2017. The endemic herpetofauna of Mexico: Organisms of global significance in severe peril. Mesoamerican Herpetology 4(3):543-620.

Luna I., J. J. Morrone and D. Espinosa. 2004. Biodiversidad de la Sierra Madre Oriental. México, D.F.: La Prensas de Ciencias.

Martínez-Antúnez, P., C. Hernández-Díaz, C. Wehenkel and C. A. López-Sánchez. 2015. Estimación de la densidad de especies de coníferas a partir de variables ambientales. Madera y Bosques 21(1):23-33.

Mata-Silva, V., D. L. DeSantis, E. García-Padilla, J. D. Johnson and L. D. Wilson. 2019. The endemic herpetofauna of Central America: A casualty of anthropocentrism. Amphibian and Reptile Conservation 13(1):1-64 (e168).

McCranie, J. R., and L. D. Wilson. 1987. The biogeography of the herpetofauna of the pine-oak woodlands of the Sierra Madre Occidental of Mexico. Milwaukee Public Museum Contributions in Biology and Geology 72:1–30.

Moreno-Talamantes, A., and M. A. García-Aranda. 2012. Cambio de uso de suelo y captura de carbono en la Sierra Madre Oriental. Pp. 67-104. *In*: J. J. Flores-Maldonado, A. Moreno-Talamantes, M. A. García-Aranda, O. A. Leal-Nares, C. Ibarra-Sánchez, R. M. González-Iglesias, C. B. Ramos-Silva, N. N. Villa-Hernández, O. G. Paz-Tovar, S. Salazar-Hernández and S. G. Ortiz-Maciel, editors, Biodiversidad y desarrollo rural en la Sierra Madre Oriental de Nuevo León. Monterrey, Nuevo León: Instituto Nacional de Desarrollo Social.

Nevárez-de los Reyes, M., D. Lazcano, E. García-Padilla, V. Mata-Silva, J. D. Johnson and L. D. Wilson. 2016. The herpetofauna of Nuevo León, Mexico: Composition, distribution, and conservation. Mesoamerican Herpetology 3(3):558-638.

Sánchez-González A. 2008. Una visión actual de la diversidad y distribución de los pinos de México. Madera y Bosques 14(1):107-120.

Treviño-Garza, E. 1984. Contribución al conocimiento de la vegetación del municipio de General Zaragoza, Nuevo León, Facultad de Ciencias Biológicas, Universidad Autonoma de Nuevo León, México. Unpublished Licenciate thesis.

Velazco-Macías, C. 2009. Flora del estado de Nuevo León. México: Diversidad y análisis espacio-temporal. Facultad de Ciencias Biológicas, Universidad Autonoma de Nuevo León. Doctoral thesis.

Velazco-Macías, C. G., and G. J. Alanís-Flores. 2014. Flores silvestre de Nuevo León: Belleza poco apreciada. Ciencia UANL 17 (69): 77-80.

Villarreal-Quintanilla, J. A. 2007. Listados florísticos de México. Flora de Nuevo León. México, D.F.: Instituto de Biología. UNAM.

Villarreal Quintanilla, J. A., and A.E. Estrada Castillón. 2008. Listados florísticos de México XXIV. Flora de Nuevo León. México, D.F.: Instituto de Biología, UNAM.

Wilson, Larry David, and Josiah H. Townsend. 2007. The biogeography and conservation of the herpetofauna of the upland pine-oak forests of Honduras. Biota Neotropica 7(1):137-148.

Wilson, L. D., V. Mata-Silva and J. D. Johnson. 2013a. A conservation reassessment of the reptiles of Mexico based on the EVS measure. Amphibian and Reptile Conservation 7(1):1-47 (e61).

Wilson, L. D., J. D. Johnson and V. Mata-Silva. 2013b. A conservation reassessment of the amphibians of Mexico based on the EVS measure. Amphibian and Reptile Conservation 7(1):97-127 (e69).

The Odyssey of 10,000 Beers: The First Six-pack of the Suizo Mountain Project

Roger A. Repp
9044 N. Valgrind Lane
Tucson, AZ 85743
repproger22@gmail.com

Mikey made me do it . . .

We speak of my first contact with Dr. Gordon W. Schuett. In early 1997, this author was writing an article that would be my first big break in herpetology. The article was about the overwintering antics of five species of reptiles around the vicinity of Tucson, Arizona. Of the five target species of reptiles under discussion in this piece, the behavior of the Western Diamond-backed Rattlesnakes (*Crotalus atrox*) (*atrox* hereafter), at their aggregate dens was what fascinated me the most. The first aggregation of *atrox* that I began visiting regularly was found on New Year's Day, 1993. It was/is a series of several massive boulders scattered along a ridge that parallels a wide, sandy wash. Each boulder is split with various cracks and crevices, that in turn shelter as many as eight *atrox*, or as few as two. There are also several loner cracks where individuals hang out. (For whatever reason, a den is not considered a den unless it contains more than one snake. This is one of many rules of the peer-review rattlesnake bookworms that I find easier to follow than dispute. This designation came from the works of Klauber, and has been rigidly followed by rattlesnake aficionados ever since). This particular series of *atrox* dens is in the heart of Saguaro country, and like all the dens that I have studied and continue to study, is surrounded by some of the finest Sonoran Desert habitat in all of Arizona. By the time I started to write my aforementioned article, I had amassed several such dens in several different locations, and began filling volumes of information in my herp journals about what I was seeing.

Figure 1. Salud! The author (left) and Dr. Gordon W. Schuett are the two architects of the nearly 15-year-long radio-telemetry study called the Suizo Mountain Project. During the course of the study, the pair worked with four species of rattlesnakes as well as Gila Monsters. A toast to Mike Dloogatch (who got the two of us together), and to the Chicago Herpetological Society as well is in order. Several members of the CHS donated money during troubled fiscal times throughout the project. Together, Gordon and I raise our respective bottles of Coors Light and Miller Highlife (nothing but the best for the CHS) with a sincere "cheers" to all of you. Image by Ryan Sawby.

I chose the *Bulletin of the Chicago Herpetological Society* to publish my findings because it had the largest membership base possible for the style of article that I was preparing. And the Chicago Herpetological Society (CHS) was, and still is, my alma mater where herpetology is concerned. This herper didn't go to college; this herper went to CHS meetings! The editor of the *Bulletin* was, and still is, Mike Dloogatch. (May he live *forever*, for the CHS is ***screwed*** without him.) Right from the start, and continuing today, Mike was a wise and kind editor. When he read my first draft, his emailed reply, among other things, included: "You might (should) contact Gordon Schuett of Arizona State University. He has published a number of papers on mating and combat in copperheads and diamondbacks." It is amazing how fate can depend on certain complex factors coming together in order for something else to develop. Mike might have chosen *not* to publish this article, or he might *not* have suggested that I contact Gordon. When I contacted Gordon, he could have completely blown me off. Any number of factors might have happened with the development of this article, and the people behind it. Had there been anything but cooperation between all of those involved, the course of history on how rattlesnake studies have developed here in Arizona might have changed. In any case, I wrote the good Dr. Schuett per Mike's suggestion, and Gordon responded in very helpful fashion. That is why we led this piece off with "Mikey made me do it." (I would not recommend that anybody make a habit of calling him "Mikey." Unlike the famous cute kid in the Life Cereal commercials, "Mikey" may not like it!)

After several back and forth correspondences, I finally met Gordon Schuett for the first time on 18 February 1997. I was speaking at a meeting of the Arizona Herpetological Association. My topic was the winter herping stuff that I was writing about for the *Bulletin*. At the end of the presentation, Gordon and his friend Jack O'Leile introduced themselves. Jack was a lean, mean fighting machine. He was a career military man—a good man to have on our side. Visualize Lance Armstrong with a dark crop of hair, and that will peg Jack. As for Gordon, at that time, visualize a more slender, bearded version of Teddy Roosevelt—without the toothy grin and wire-frame glasses. Add to this description the nickname he earned from his high school wrestling squad, "the Pit Bull," and you will not be too far off. (Yes, Gordon is a Pit Bull—in both his physique *and* disposition. There is a lot of fight in this dog!) Jack was kind enough to suggest that I was off a little with some of my terminology in my presentation. Jack had worked with Dave Duvall and Steve Beaupre with some drop-jaw awesome *atrox* dens near Phoenix. It was Jack who first defined a behavior known as "stacking." Simply defined, stacking is a behavior that male *atrox* use to beguile rival male *atrox*. Should a female *atrox* be found coiled

outside of a den by any pumped-up, horny male, the male will coil over top of her in such fashion that the female is completely hidden by his coils. Hence, the lady is not visible to the many other gentlemen who might come a-calling. According to Jack, there are very stringent rules regarding exactly what stacking is--and isn't. I apparently did not get those rules quite right in my presentation. But Jack was polite with his critique, and the meeting between Gordon and me went swimmingly well. In what was to become customary in the days and years ahead, Gordon gave me a stack of peer-reviewed papers a half-inch thick, with the promise of more "the next time we see each other."

The next time we saw each other was pretty damn soon after that first face-to-face encounter. Our first field outing together was 14 March 1997—less than one month after the AHA meeting. I chose Ron's Den as the place that we would go. Ron's Den had been under my watchful eye nearly every day before I took Gordon there. I had seen enough to not just *think* something cool was about to happen there, I *knew* it! As we were rolling down the back roads in my Suzuki Samurai, headed for Ron's Den, I offered Gordon a packet of my Buster Bronco beef jerky. The packaging on this semi-edible product (which tastes only slightly better than the packaging itself), was such that it was all I could do to hack my way inside with a knife. Gordon impressed me mightily when he chomped down on one edge of the packet with his teeth, and with a powerful yank, effortlessly tore it open. Yehaw! Had I tried that, there would have been teeth flying all over the place! As I was a smoker at the time, I felt great relief when he offered me a cigar. And so the two of us puffed away, stinking up both my rig and the backroads all the way to the parking spot at Ron's Den. With many assurances that Ron's Den was very close to showing us something big, Gordon had brought his video camera along. The reader must remember that this is 1997 that we're talking about. There was no digital anything during this time period. Visualize a 50-caliber machine gun, with a much sturdier tripod, and you get the picture. We hiked the half-mile of terrain between the parking spot and den, with Gordon carrying the whole works. It *had* to weigh at least 50 pounds, yet he carried it cradled in his arms as though it were nothing but a baby wrapped in swaddling clothes. It is not a difficult hike, but the pathway to the den takes one through several *miserable* stands of catclaw acacia. How he managed to get through it all without tearing himself to shreds was nothing short of amazing.

I have described Ron's Den many times in these columns. The best description of all, with many photos, can be found in the December 2015 issue of this publication. See also Figure 2 in this article. Upon our arrival, the den's alpha male "Tyson" could be seen patrolling inside and out of both the west and east openings of the den. This was normal, but always filmable. There were five other *atrox* huddled at the outer edge of both entrances. What *was* happening, that was *very* filmable, was a pair of *atrox* that were viewed in the latter stages of mating. The pair was slowly crawling eastward, away from the den. The female was crawling forward, and the male was crawling backward—in an obvious attempt to both keep up and keep in. While Gordon set up his video camera, I took a knee and began to photograph the pair. I eventually realized that I might be blocking Gordon's angle, and turned to see what he was doing. Much

Figure 2. Ron's Den. The author has watched this Western Diamond-backed Rattlesnake (*Crotalus atrox*) aggregate den since 1995. On our first field outing together, 14 March 1997, Gordon and I visited this den. Image by the author.

to my surprise, I saw him just squatting there behind his camera. He was not looking through it, but over it. He was just staring at the scene, and obviously not filming it. If anything, his wide-eyed visage reflected a form of perplexed consternation. His posture was reminiscent of a World War II German soldier sitting at the ready, without firing any bullets. But his head was lacking the iconic *Stahlhelm*. When I asked if he was going to start filming, he woefully admitted "I forgot to bring film." His somewhat calm demeanor impressed me. Had the roles been reversed, I would have been throwing stuff around and cussing up a blue streak. It wasn't until later that I learned that he also wanted to yell and cuss, but was trying to make a good first impression. By the end of our outing, we had seen 19 *atrox* in various locations, and our friendship was off a good start.

Later that evening, we were discussing the finer nuances of the term "stacking." I told Gordon something that Fred Wilson had told me. Fred was at the time working with Harry Greene and David L. Hardy Sr. on a Ridge-nosed Rattlesnake (*Crotalus willardi*) project. Fred informed me that he had seen *willardi* perform the stacking behavior several times. Things got a little heated after I reported this to the good Dr. Schuett. He grew quite animated, and hand wrote in one of my journals the origins of the definition of the word stacking. At the time—and up to this very day—*atrox* was the first and only species for which this phenomenon was documented. It was first described in a poster presentation by O'Leile et al. in 1994. (What the good Dr. Schuett was doing was protecting the integrity of a term invented by our mutual friend Jack O'Leile. The term "stacking" has spread like wildfire to include other species of pit viper, yet there is *nothing* in the peer-reviewed literature about it being observed in other species.) He then signed and dated his abrupt notation, and exhorted me to show *that* to Fred—and Harry Greene as well. I, of course, did nothing of the sort, but was amused by the passion of it all. I also had my first glimpse of the Pit Bull side of the man. Before going one step further, this author feels compelled to explain something about this Pit Bull business. This is a solid example of the old saying "listen to the pot call the kettle black." If Gordon was a Pit Bull, his new friend was a Rottweiler. Yup! Me 'n' Gordo—a Pit Bull and a Rottweiler—sums it up nicely. And how two thick-headed,

prima donna Germanic herpers like ourselves have beaten all the odds against us over the past 23 years by remaining friends is a mystery that even the two of us can't fathom. But we get ahead of ourselves, and as further narratives will clearly demonstrate, our relationship has been far from harmonious.

Another discussion ensued the night of our first field outing. At that time, the Harry Greene and Dave Hardy telemetry study with Black-tailed Rattlesnakes (*Crotalus molossus*) in the Chiricahua Mountains was the stuff of legends. The duo was akin to Simon and Garfunkel in the herpetological world—deservedly so. That night, Gordon told me that he wanted us to be like them. This author could list a few teams of scientists and field rats who have worked together successfully through the years. And while there will *never* be a team like Greene and Hardy, I understood the gist of what Gordon was saying. It was flattering to even consider something like that happening between us. But I also knew not to get my hopes up too much. A relationship like Gordon was describing takes a long time to develop, and any number of things can happen—or not happen at all—to scuttle any hoped-for association.

As time progressed, so did the new Simon and Garfunkel (or, Pit Bull and Rottweiler). My journals are packed with field trips that occurred between 1997 into the spring of 2001. But as our relationship evolved, so also did my style of studying rattlesnakes. My hands-off method of herping was recklessly abandoned in favor of the full-up science that is a definite requirement for any and all herpetological field studies. We speak of full-up processing, including blood draws, on our subjects. We waded into nearly every den I had, and without regard to the consequences, met the demands of science. I have to admit that processing rattlesnakes is among my own top fun things to do. There is always a thrill to be had when one is thrust into a world filled with singing rattles and escaping snakes. It is indeed great fun for all, except maybe the snakes. But I am still seeing negative results of what was done in the years 1999 through 2001 at some of the places that I visit. This aspect of scientific research eventually led to some serious rancor between Gordon and me. But said rancor was going to take a while to develop. And we obviously got over it.

During these early years of all-out bloodlust herping, I kept one place to myself. The holdout location was a small hill that I had been visiting since 1992. (See September 2015 of the CHS *Bulletin*.) For over six years, all that I found on this hill were Sonoran Desert Tortoises (*Gopherus morafkai*) and Western Lyresnakes (*Trimorphodon lambda*). But these two herp species—especially the latter—were more than enough to keep me coming back to it. I named this little hill "Iron Mine Hill." The hill is a stand-alone outlier of the Suizo Mountains, in Pinal County, Arizona—located roughly 30 miles north of Tucson. It was not until 21 February 1999 that I found the first denning Gila Monster on Iron Mine Hill. Until then, a place called Ragged Top had been the only place where I could consistently observe hibernating Gila Monsters. But all of the Ragged Top Gila holes wound up empty as a result of the drought of 1996–1997. I was delighted to find the Iron Mine Hill monster in 1999, and the value of the real estate on that hill skyrocketed as a result. Ragged Top was dropped like so much soiled toilet tissue, and a more thorough visual scouring of Iron Mine Hill began. The first rattlesnake den was found six days later, on 27 February 1999. It had been right under my big nose since my very first visits there, but I simply had never found it. While seven other *atrox* dens were subsequently discovered through the years, this first one still remains the best. It still carries the name "*Atrox* Den #1," or AD1 for short.

In the winter of 2001, Gordon gave me a phone call. He was doing a radio-telemetry study on Gila Monsters with Brian Sullivan in the Phoenix area, and they had a few transmitters to spare. He suggested that we start a radio-telemetry project on *atrox* at a place we call Hill 97, which is an outlier hill of the 96 Hills area. (See the January 2016 *Bulletin*.) At his offer, I choked down a laugh. For several years, I had been getting multiple offers to do a radio-telemetry project from the University of Arizona herpers. With each of their offers, I would get all jacked up, only to be let down when it was discovered that their offers were nothing more than a bunch of alcohol-induced, flaky bullshit promises. But I responded favorably to Gordon's inquiry, without making the mistake of getting too excited about it all. Nevertheless, a few solo visits to Hill 97 ensued in the days that followed, and it was noted with some disappointment that the *atrox* dens had crashed. Also, the winter rains of 2001 were generous to the point of making the roads to Hill 97 impassable. We damn sure could *not* start a study in a place that we couldn't get to! In short, this herper was bummed about the prospect of starting a radio-telemetry study at Hill 97. The place is steep, with loose, crumbly soil and nothing but menacing teddy bear cholla to stop a clumsy fall. And if the cholla didn't hang us out to dry, the Africanized bees would. There is an active hive in or near every *atrox* den there. It was time to bail on this foolish Hill 97 notion.

Even before any discussion on radio-telemetry had come up, the good Doctor Schuett had been informed that I was holding out on him. There was this "super-secret spot" under my watch. It was my own private laughing place, a place flowing with *atrox*, tortoises, lyresnakes and Gila Monsters. Gordon hinted from time to time that he would like to go there, but he was thwarted. Everybody needs a laughing place, and it was ascertained that if we started yanking *atrox* from dens for processing on Iron Mine Hill, there would be no more laughter for me. But a full blown radio-telemetry study was an entirely different matter. Once I knew that Gordon was serious about his radio-tracking offer, in purposeful fashion, I began to intensify my exhortations for my super-secret spot. It was clear to me that the time had come for the old bait-and-switch routine. Hill 97 was *not* going to work for us. I instead began to hint about the many virtues of Iron Mine Hill: "Hey Doc, I saw six *atrox* today at my super-secret spot. I should take you there sometime . . . "

Thus it came to pass that on 10 March 2001, the good Dr. Schuett first laid eyes on my super-secret spot—AKA Iron Mine Hill. To his credit, he *loved* the place. Had he said, "Oh no, this won't do," that would have been the end of it. We would have gone back to Hill 97, eventually crucifying ourselves on teddy bear cholla whilst ferocious bees punched little venomous holes into our anatomy. (All while finding nothing in the process.) To this very day, we both congratulate ourselves at great lengths on

Figure 3. The first and second Gila Monsters (*Heloderma suspectum*) ever found by me on Iron Mine Hill. The image on the left is number 1, and on the right, number 2. Both are basking outside their winter lairs on 23 January 2001. The author speculates that these may be the first ever images to be published of basking behavior by Gila Monsters in January. See the text for details of the *smashing* first impression that number 2 gave the author. Images by author.

the decision to drop the Hill 97 notion. We could not have lasted there.

Meanwhile, as a set-up for what was about to happen with our inaugural 10 March 2001 visit to Iron Mine Hill, this author wishes to relay something about the second Gila Monster I ever found there. I found him on 13 January 2001. Like all the monsters found in the dead of winter, this one was an adult. He was first viewed in a narrow soil hole, what I now call a "Gila hole." This Gila hole, an overwintering site, was at the base of a knee-high rock shelf. The head of the monster was roughly 30 cm (12 inches) deep, facing out of the hole. I was still in my infancy at finding Gila Monster overwintering holes, and each and every one—both then and now—is priceless to me. There was *great* (but silent) rejoicing when I found this one. I visited him again on 19 January, finding things unchanged. It was when I visited him on 23 January that I witnessed something that I had never seen before, or since, with a Gila Monster. He was first viewed completely out of the Gila hole. My notes indicate that he was 20 cm out of said hole, and the sketch in my notes show him to be sprawled out at 45 degree angle with regard to that hole. He was sound asleep. I began to unzip my camera case, and as quiet as that action was, it snapped the monster into a full state of alertness. He then reacted violently to my presence. He began to hiss and perform a series of head bobs and open mouth threats. He then began to crawl backwards toward the hole. He was gaping so widely at me that I envisioned his head splitting in half. The top and bottom jaw were nearly at a 180-degree angle to each other. So wide open were his jowls, and so engrossed was this monster with his threatening display that as he backed up, he actually missed the hole that he was attempting to back into. His little Gila Monster fanny instead connected with the rock shelf to the right side of the hole (my left—his right). He began to slide backward along that shelf, until his body was entirely parallel with it. I was appalled with myself at the way this was going, as I didn't want to do *anything* to possibly scare this animal away. But it would be stupid not to take a photo. It was at this point that I took some photos (Figure 3). As soon as this photo transpired, all hell broke loose. While the monster could easily have slipped headfirst into the hole, he instead gaped at me again—*and advanced*! He charged straight at me, hissing away and vigorously head-bobbing. I was so surprised by this reaction ***that I forgot to take a picture!*** The money shot of the century came and went when, instead of taking the picture, I turned tail and ran! I did not turn and run because I was afraid. The monster performed this very brave act for one reason: he wanted to scare me away! And if I acted afraid, and ran away, perhaps he would not abandon his lair? As crazy as this will sound to the discerning field herpetologist, I was positively *mortified* that I had just done something that might drive this monster off. Once that happens, they are extremely difficult to find again. And they might never come back again to the location that they were scared away from. When you drive an animal away from such a place, the penalty is far more than just an opportunity to see something special for a few months. Decades of potential future observations go right out the window. In any case, the ploy seemed to work. I returned a little more than an hour later, and found him sleeping outside the hole again. This time, I did *not* wake him up! He appeared to be kind of grumpy about such things.

By this time I had developed a way of using abbreviations to describe the herps that I was watching. Taking notes with pen and ink is a laborious process, and any way to consistently record data that is consistent—and short—is a good way to go. As Iron Mine Hill was a part of what I was doing in the Suizo Mountains proper, I began to use the letters "SM" to define each animal. As I had now found two Gila Monsters there, they were defined only as SMGila1 and SMGila2. While I was waiting for things to settle down a bit with the rudely awakened SMGila2 this day, I visited SMGila1. He was overwintering in the same burrow that he was at in 1999. This fact serves to cover my argument about being *very* careful with observing wild Gila Monsters. Thanks to the careful hands-off mentality, I am able to show the reader something that to the best of my knowledge, has never been published before. We speak of two Gila Monsters basking during the month of January (Figure 3).

Before we go back to 10 March 2001—Gordon's first visit to the place—I am sharing the very last image of good old SMGM2 while he was still a wild thing (Figure 4). The date of this sighting was 9 March 2001. By this point in time, he had seen me so many times that he was accustomed to my presence.

Figure 4. His last day of freedom! The second Gila Monster ever found on Iron Mine Hill as he appeared on 9 March 2001. He was captured one day later, and became the first subject of the Suizo Mountain radio-telemetry study. Image by the author.

The day I took this image, he was sleeping. He woke up, looked up at me, and went right back to sleep. "Oh, it's *you* again. Z-z-z-z-z-z." This is said to inform the world that given time and proper technique, a winter-denning monster becomes habituated to the cautious, careful human observer. As was so patiently explained to me during the writing of the 1997 article (which for some reason did not appear in the *Bulletin* until March 1998), once you molest them, everything changes. I was soon to find out how true that notion can be.

On 10 March, one day after the Figure 4 image, Gordon and Jack O'Leile met Erika Nowak (who was visiting from Flagstaff) and me at another location. As hard as I try not to name-drop in these columns, it can't be helped. While my name is the only one attached to the March 1998 *Bulletin* article, several heavy hitters offered input. Erika Nowak is now Dr. Erika Nowak for very good reasons. The pre-Dr. Nowak was extremely helpful with preparing the article. Moving along, once we were together, all three of them were made well aware of my expectations of them. We were not to touch anything, and they were *not* welcome to return without me. Once this was agreed upon by all parties involved, we headed for Iron Mine Hill. The weather was not at all conducive to seeing any basking whatsoever there. My notes indicate that it was 13°C, 40 to 80% cloud cover, 70% humidity, with gusty breezes of 5 to 15 miles per hour, and light, intermittent rain showers occurring. In short, it was the perfect day to *not* start a radio-telemetry project. We were in theory just looking, and everything was crammed deep within their hidey holes. Nevertheless, upon our arrival, off we went to view the five known *atrox* dens that were under watch. Three of these five dens were stuffed with *atrox*, and poor Gordon must have been jonesing pretty badly about not getting any blood from them. Eventually, we found ourselves in front of the lair of SMGM2. Unlike the previous day, this monster was dug into his lair deeper than a Texas tick. Skipping blood samples from *atrox* was one thing, but getting blood from a Gila Monster was another. Gordon insisted that he wanted blood from this animal. It was then that he witnessed, maybe for the first time, the Rottweiler come to life. He was told in no uncertain terms that he was not to touch this animal—ever! But I did agree to let him do so if we could stick a transmitter in him. To my surprise, he said with but a moment's hesitation "We can stick a transmitter in him if you like." Well, friends to the end, and that was the end of my peaceful relationship with this monster. Once it had a transmitter in its innards, it could run, but it couldn't hide. He was *mine*! The four of us slipped away from the den to discuss the strategy for starting our supposed *atrox* telemetry study with a Gila Monster. While Jack, Erika and I favored waiting for nicer weather, when our monster might be out, Gordo was for striking *now*, while the iron was hot. He was 100% cock sure that he could stuff that meaty arm of his deep into that tight hole and catch that monster. There was a *lot* of back-and-forth between us about this. In the end, I agreed to let him try it, with the proviso that Gordon's effort *could not fail*. In return, I received concrete assurances that there was no way things would go otherwise. In retrospect, said concrete assurances were a prime example of an alligator mouth getting in the way of a hummingbird ass. And so, down on his belly went old Gordo, and he thrust that thick, hairy right arm of his into that tight soil hole. All the way to his armpit went that arm. And then my ears heard the words that sent the Rottweiler into *one hell of a rampage*. "Roger, I can't reach him!" Gordon was now inches from his grave in two different directions.

"***You better not pull your arm out of that hole without that Gila in your hand!***" I howled, addressing the heavens, the earth, the moon, stars and universe. "You catch that monster, or *I swear to God I will wear your guts for garters*. YOU SAID you could catch him***—now catch him***!" For fully ten minutes Gordon had his whole arm buried in that hole, while I stormed about back and forth cussing, discussing, and re-cussing his name. Threats of bodily harm were issued, and the taunts were plumb dog-mean. Perhaps the out-of-control rampage inspired Gordon's arm to grow a bit, because finally I heard the words I was hoping for: "**Got him!"** A few seconds later, he pulled his arm out. The first subject of the Suizo Mountain Project was clamped tightly in his hand. And that first subject was a ***Gila Monster***! Yeah, baby! I, of course, immediately forgave myself for my tantrum, and all was well in my world again. As I whispered to Erika a little later "I would 10,000 times rather track a Gila Monster than any stupid *atrox*." It was not until later that I was to learn what radio-tracking a Gila Monster really entails. And as it turned out, *atrox* ain't so bad after all . . .

A full-up processing of this magnificent Gila Monster later revealed that his (and he *was* a he) snout–vent length was 31.5 cm (12.4 inches). His tail length was 15 cm (5.9 inches). His total body mass was 482 grams (17.2 ounces—just over one pound). Following the processing, we all sat down and had a celebratory beer. Thus began our odyssey of 10,000 beers, which by my calculations has since been multiplied three times over. Although the actual telemetry aspect of the study ended in January of 2016, we continue to publish our findings. While many peer-reviewed papers and book chapters have contained the results of our efforts, we have not even scratched the surface.

An epilogue of sorts is in order for the first Suizo Mountain subject. SMGM2 became Hs1 (*Heloderma suspectum* number 1) the instant that he was in Gordon's hand. He later earned the name of "Geronimo." But that is yet another story for later. On 16 March 2001, Geronimo was released back into the hole

where he was found and captured. Four hours later, we tracked him for the first time. He had left the hole, and had gone over the top of Iron Mine Hill—all the way to the bottom of the opposite side. Even though we followed him for over 3 years—he *never* returned to that same hole. To be sure, other Gila Monsters used this place, and Geronimo got close on a number of occasions. But he *never* again went back to that exact hole. Score one for the "hands off" wisdom displayed in the article that Mr. Dloogatch saw fit to publish so many years ago.

There is a tendency for people—especially herpers—to allow one argument to end a friendship. Two herpers can be the best of friends, and then, one blowout ends it all. There is a very fine line between love and hate, and when that line is crossed the strength of that relationship is tested. "One and done" has happened to me so many times through the years that it *almost* laughable. But as I age, I realize the danger of ending life's journey alone. It's not funny anymore. I want to do everything in my power to *not* lose any more friends. I can't afford it. Were the situation between the Pit Bull and the Rottweiler a one and done affair, I would have *definitely* lost someone special in my life a long time ago. While there were many times that we both threatened to take our toys and go home, within days of whatever particular squabble we were engaged in, one of us would contact the other and dismiss it all with "What time are we meeting on Saturday?" While the radio-telemetry aspect of the Suizo Mountain study ended in 2016, the best of Dr. Gordon W. Schuett and Roger A. Repp—the Pit Bull and the Rottweiler—is yet to come. See Figure 5. The image depicts the two of us very happy together, and it serves to remind me that these were the best years of my life. I owe a lot to the good Dr. Schuett and all the events that led to our working together as a team.

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

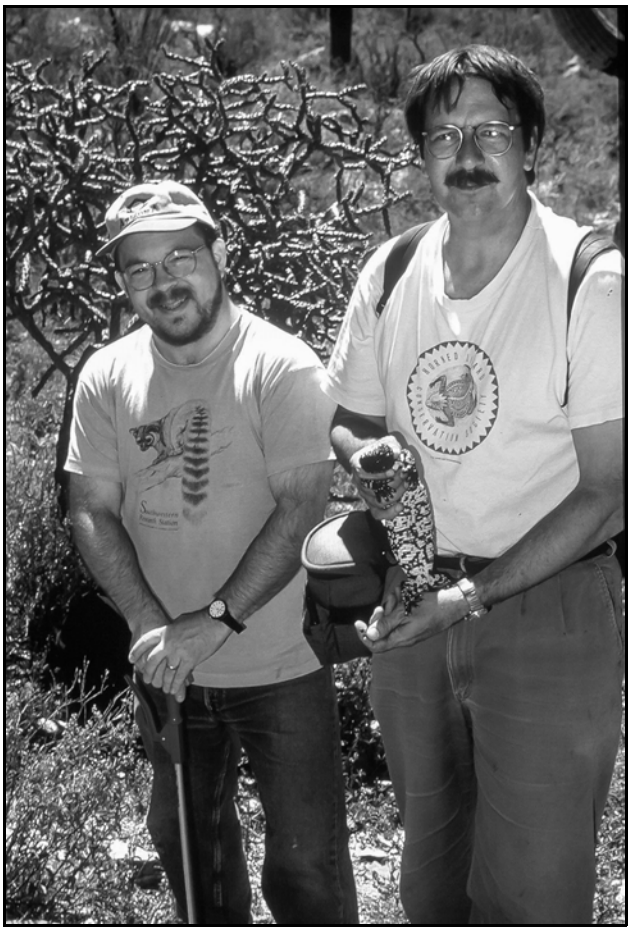


Figure 5. (Left) Gordon Schuett and Roger Repp in a very happy state of mind. The Gila Monster, who was the very first subject of the Suizo Mountain Project, is probably not very happy. He had every reason to be a poopsock about it all. But he was released a few minutes after this photo, which probably made him ecstatic. Image by Dr. David L. Hardy Sr., 16 March 2001.

Minutes of the CHS Board Meeting, January 17, 2020

John Gutierrez called the meeting to order at 8:10 P.M. Board members John Archer, Mike Dloogatch, Annalisa Kolb and Jessica Wadleigh were absent. Minutes of the December 13 board meeting were read and accepted with changes.

Officers' Reports

Sergeant-at-arms: Mike Scott reported 37 in attendance at the December 18 holiday party.

Committee Reports

Shows: Gail Oomens reported that the CHS will display at two shows on January 26, including WildFest at Bolingbrook High School. Help is needed. We will also be at two shows on February 8: Tinley Park Fishing & Outdoor Show at the Tinley Park High School, and a Kids Expo in Schaumburg.

Junior Herpers: the February meeting will be a field trip to the Garfield Park Conservatory. At the March 8 meeting, members will be coached on handling animals at ReptileFest.

New Business

Tom Mikosz would like to see the moratorium on reticulated pythons lifted. If the owner properly displays any animal in accordance with state law and the CHS guidelines there should be no need for restrictions. Per CHS guidelines any constrictor over 10 ft should have a second person on hand regardless of the temperament.

Rich Crowley would like to provide a tribute/recognition to an Eagle Scout who created a herpetarium at his school (possibly a membership to the Society).

The meeting adjourned at 11:04 P.M.

Respectfully submitted by recording secretary Gail Oomens

What You Missed at the January Meeting: Mike Stefani

John Archer
j-archer@sbcglobal.net

If one goes by the opening photo of the talk, "Captive Husbandry and Breeding of Monitor Lizards (Varanids) with Mike's Monitors" one would assume that huge arms and cool tattoos are needed. An intimidating look might be a plus. I think that Mike Stefani would agree that tattoos and a fierce look are peripheral to that goal, but strong arms would definitely be a plus. Mike happens to be a good friend of our new president and has bred monitors for over 20 years. He drove down from Wisconsin with many of his family and friends and attempted to condense 20 years of knowledge into an hour-long talk. I doubt from what I learned that I could successfully breed all the species that Mike has, but should I try, I have the basics and know where to turn for more help.

Mike Stefani takes monitors very seriously. (All photos by Mike or Angalino Stefani.)

Mike's second slide was titled "Five Key Steps to Successful Varanid Husbandry." The list:

1. Naturalistic Enclosure (IMHO)
2. Proper Heating
3. Varied Diet
4. Maintaining Water Basin
5. Soil Maintenance for Nesting Females

Mike started off by saying that "Of course, there's always more than one way to skin a cat." I always listen more closely to experts who are willing to admit they don't know everything and don't have all the answers. But with some slight modifications, his five steps could be applied to any reptile husbandry. He proceeded with an interesting and engaging presentation of how he has applied those rules to his animals.

We saw photos of really nice cages which rivaled any I've seen at zoos. Mike stressed that varanids are tough, so there's no excuse for not building naturalistic cages out of what one can find outside. He's built large cages with varying conditions depending on the species. Three-hundred-gallon tubs provide excellent ponds for some lizards and deep nesting soil for others. When you're a varanid guy, " . . . you pick up dirt, you smell dirt, you hold dirt, you shake dirt." A "forest floor" dirt that is soft and loamy is good for most, but Mike modifies the soil depending on the species' needs. He adds fake flowers along with logs and nesting sites. People have told him that the animal knows the plants are fake. Mike replies that " . . . he don't think that light bulb is the sun either." Fake plants create visual blocks that lessen conflict and give the animals more security. And they really look good.

Mike went into some detail about Polygem Zoopoxy, a two-part epoxy that is hard as rock and is non-toxic to plants, animals, and fish once cured. He told of the problems with trying other surfaces before using Zoopoxy and gave us a short lesson on application and results. He totally endorses the product because of the way it has resisted the abuse of large lizards. His slides showed the really attractive results.

For heat sources Mike uses Halogen flood lights that create hotspots of 150°F. He advises avoiding spotlights because of the risk of burns. I found it interesting that he uses Sylvania halogen flood lights with no advertised UVB. A heat mat is used against the side of dirt tubs to boost the soil heat. Mike warned that if a monitor burrows into cool soil it will likely go dormant and not emerge unless dug out. It might even die. Temperature is important both above and below the surface.

We saw slides of the dinner menus. He feeds a wide variety of food, stressing that even large monitors should be fed lots of insects and minimal rodents. Eggs and birds are popular feed items. He adds commercial supplements to the diets. His freezer is full of interesting items, much like any of us who keep animals.

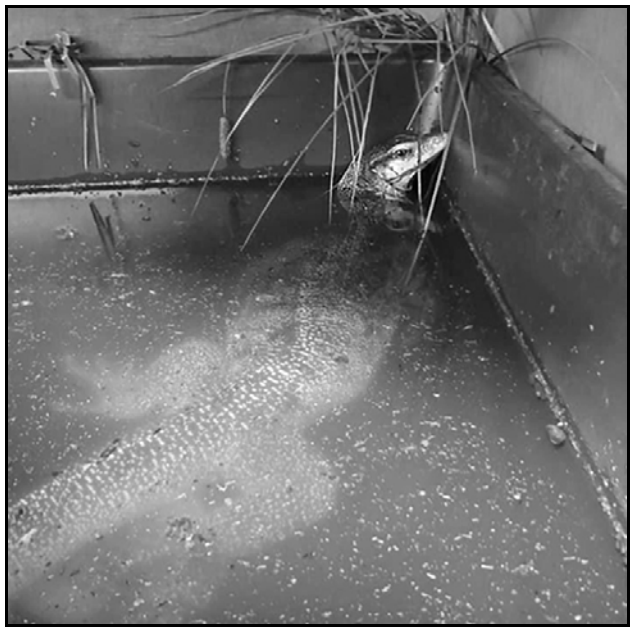
Mike is justifiably proud of one of his extraordinary cage setups.

Mike feeds lots of insects, birds, eggs, and very few rodents.

Water is a major concern when dealing with monitors, because most will defecate in water, and even if they defecate on land, they'll certainly foul the water with loose bits of substrate. Applicable to any animal, Mike promotes a system that is easy to keep clean. While few of us probably can afford the Oase pond filters and vacuums, adding drains to your water tubs and rigging some type of vacuum to clean the water is essential for monitors. Mike cleans his tubs every day.

What he winds up with is happy, healthy monitors who reproduce well and are kept in cages with a wow factor. He has one that even has a window cut into the side of the water tub so one can appreciate the fish that he also keeps in the tank. That combination led to an interesting story demonstrating the intelligence of the lizards. If you're lucky enough to meet Mike sometime, be sure to ask him about the zebra fish hunt.

I doubt that many of us will have this complex a setup, but Mike stressed the advantages of easy cleaning for his water tanks.



Water changes must be frequent. Even substrate will rapidly cloud the water.

Mike is obviously fond of his animals and keeps them in exemplary conditions. That pays him back by enabling breeding of some difficult animals, but I'm sure he gets as much joy from knowing that his animals are happy. He is on Facebook as Mike's Monitors and his website is currently being renovated. On Facebook he's posted some interesting photos and videos. If you're interested in monitors, or want to see spectacular cages, you'll want to check those sites out. And if you get a chance, listen to him give a presentation. He's funny and informative. We were lucky to have him speak.

The results of Mike's dedication and care, a baby peach-throated monitor (*Varanus jobiensis*).

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 785-224-7291 or by e-mail at kelhal56@hotmail.com

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

Lynda Cafasso
Pepper Engel
Channel Esposito
Gabrielle Evans
Samantha Jones
Anna Lukyanovskiy
Shae Spates
Dominic Stefani
Michael Stefani
Mario Torres

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, February 26, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Michael Redmer** will speak about recovery efforts for the eastern massasauga rattlesnake throughout its range, and also present a brief, generalized history of that species in Illinois. Mike is a senior biologist for the U.S. Fish and Wildlife Service, and has been a CHS member since he was a teenager. He currently serves as the USFWS lead national biologist on the eastern massasauga.

At the March 25 meeting our speaker will be **Dr. Eli Greenbaum**, associate professor of evolutionary genetics at the University of Texas at El Paso. Dr. Greenbaum is the author of *Emerald Labyrinth: A Scientist's Adventures in the Jungles of the Congo*.

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. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

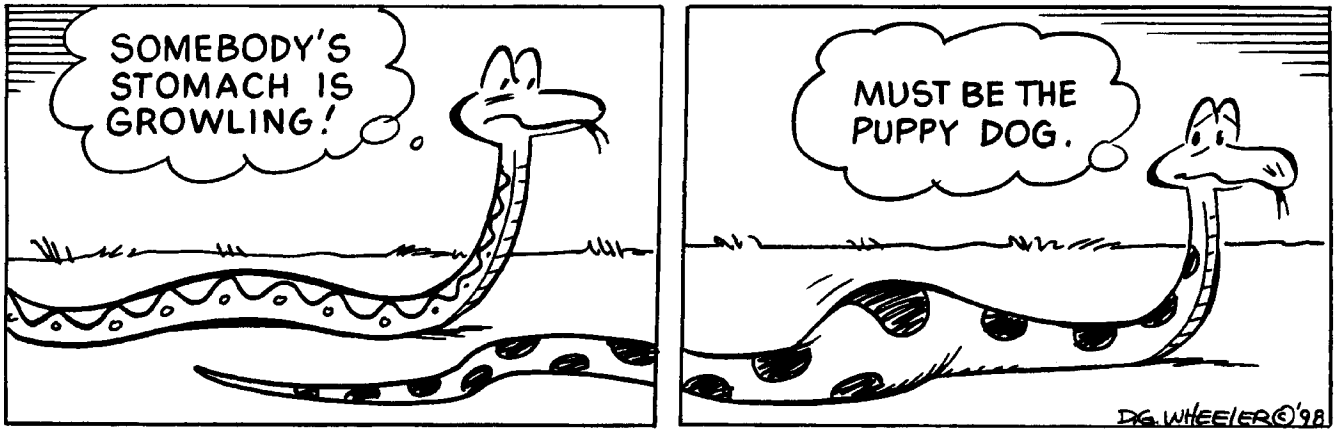
Board of Directors Meeting

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 next board meeting, to take place on March 13, 2020. If you wish to attend please email mdloogatch@chicagoherp.org.

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



**Periodicals Postage
Paid at Chicago IL**

CHICAGO HERPETOLOGICAL SOCIETY

Affiliated with the Chicago Academy of Sciences

2430 North Cannon Drive • Chicago, Illinois 60614