

THIS MONTH'S SPEAKER

**Dr. Anna E. Savage**  
Postdoctoral Fellow  
Smithsonian Institution

Immunogenetic adaptation to  
an emergent amphibian disease  
in the Lowland Leopard Frog  
(*Lithobates yavapaiensis*)

7:15 PM  
Tuesday, 20 December  
University of Arizona, BIOS/Keating Building  
1657 East Helen Street

Anna Savage grew up in Northwood, NH, where she did not go to school, but instead spent her childhood observing, catching, and playing with frogs. She attended Amherst College, where she majored in biology, spent a semester abroad at the Center for Rainforest Studies in Queensland, Australia, and did summer research on lobster behavior at the Marine Biological Laboratory in Woods Hole, M.A. Her senior honors thesis in Jill Miller's lab on genetic self-incompatibility systems in flowering plants cemented her interest in academic research, and she began working on her Ph.D. in Kelly Zamudio's lab at Cornell University in 2005. Anna's thesis research



Anna testing frogs for chytrid in Ithaca, NY. Photo by David Rodriguez (2011).

combines her two primary interests: evolutionary genetics and amphibian conservation. She studies genetic responses of Lowland Leopard Frogs (*Lithobates yavapaiensis*) to infection with the emerging fungal pathogen *Batrachochytrium dendrobatidis*. Over the past six years, and with the aid of several local Arizona herpetologists, Anna has surveyed fourteen Lowland Leopard Frog populations each summer and winter, collecting skin swabs, toe clips, and occasionally egg masses to bring back to Cornell and rear in the lab. Combining field sampling and experimental infections, Anna has characterized immunogenetic diversity among frog populations, identifying genetic variants that associate with higher and lower disease susceptibility. She will discuss the role of MHC genes in determining chytridiomycosis outcomes in natural populations of Lowland Leopard Frogs, both in nature and in the lab, with emphasis on conservation implications for native Arizona ranid frogs.

FEATURE ARTICLE

123 "Amphibians and Reptiles of the Northern Jaguar Reserve and Vicinity, Sonora, Mexico: A Preliminary Evaluation" by James C. Rorabaugh, Miguel A. Gómez-Ramírez, Carmina E. Gutiérrez-González, J. Eric Wallace, and Thomas R. Van Devender

MEETING MINUTES

131 27 September and 25 October, 2011

NEXT MONTH'S  
SPEAKER

TBD

Tuesday, 17 January

Tucson Herpetological Society meetings are open to the public and are held on the third Tuesday of each month starting at 7:15 PM

# Amphibians and Reptiles of the Northern Jaguar Reserve and Vicinity, Sonora, Mexico: A Preliminary Evaluation

James C. Rorabaugh<sup>1</sup>, Miguel A. Gómez-Ramírez<sup>2</sup>, Carmina E. Gutiérrez-González<sup>2</sup>, J. Eric Wallace<sup>3</sup>, and Thomas R. Van Devender<sup>4</sup>

<sup>1</sup>Retired U.S. Fish and Wildlife Service, Saint David, AZ; <sup>2</sup>Naturalia/Northern Jaguar Project, Sahuaripa, Sonora; <sup>3</sup>University of Arizona, Tucson, AZ; <sup>4</sup>Sky Island Alliance, Tucson, AZ

The Northern Jaguar Reserve (Reserve) in the Municipio of Sahuaripa, Sonora, Mexico, lies in one of the most remote, least populated, and wildest areas of northwestern Mexico. Encompassing 77.8 square miles (20,140 ha) bounded by the Río Aros on the east and north, the Río Yaqui on the west, and lying south of the Aros/Bavispe confluence and north-northeast of the town of Sahuaripa (Figure 1), the Reserve is in the foothills of the Sierra Madre Occidental at elevations ranging from approximately 4580 ft (1396 m) in the Sierra Zetasora to 1420 ft (433 m) near the Ríos Aros and Bavispe confluence. The border crossing at Douglas, Arizona/Agua Prieta, Sonora lies 124 miles (200 km) NNW of the northern boundary of the Reserve. The vegetation communities of the Reserve are dominated by foothills thornscrub below about 2953 ft (900 m) and oak woodlands (Felger et al. 2001) above that, forming a temperate-subtropical ecotone. Oaks occur lower on north facing slopes and sparsely along arroyos, and thornscrub can be found at higher elevations on south facing slopes. The Reserve is owned and operated by Naturalia, a Mexican non-governmental environmental organization, with support from the Tucson-based Northern Jaguar Project. The Reserve was originally purchased as a refuge for the northern-most, known breeding population of Jaguars (*Panthera onca*), but is also notable for presence of Ocelots (*Leopardus pardalis*), Neotropical Otters (*Lontra longicaudis*), Military Macaws (*Ara militaris*) and other tropical species that intermingle with animals and plants characteristic of temperate North America.

The objective of our work was to compile a preliminary list of amphibians and reptiles from the Reserve and vicinity with notes on habitat use. Our study area includes that region shown in Figure 1.

## Methods

We made numerous trips to the Reserve and adjacent areas to search for amphibians and reptiles, often in the course of other work. CGG and MAGR are the resident reserve biologists, stationed in Sahuaripa, who frequent the Reserve. In July-August 2005, JEW participated in a biological inventory of the Ríos Aros and Yaqui (with a focus on major tributaries) from the town of Nátora on the Aros downstream for 115 river miles (184.8 river km) to El Río on the Yaqui, near the confluence with the Río Sahuaripa. That work included the portion of the Río Aros that forms the eastern boundary of the Reserve, as well as adjacent



Figure 1. The Northern Jaguar Reserve and vicinity, which lies in east-central Sonora. The northern boundary of the Jaguar Reserve is 124 miles (200 km) SSE of the border at Douglas-Agua Prieta. Small inset: black dot marks general reserve location.

reaches of the Río Yaqui to the west of the Reserve (O'Brien et al. 2006). JCR visited the Reserve for biological inventories and to conduct bat and amphibian workshops during June 2008, April 2009, and April 2010, and also collected frogs at the confluence of the Ríos Yaqui and Sahuaripa in April 2008 as part of the work reported by Oláh-Hemmings et al. (2009). TVD visited the Reserve during September 2009 and March-April 2011.

Most amphibian and reptile observations were obtained by walking trails or along arroyos. We photo-vouchered amphibians and reptiles, if possible, and documented localities and habitats in which animals were found. We are in the process of accessioning these data into either or both of the University of Arizona Herpetological Collection (UAZ) and the Madrean Archipelago Biodiversity Assessment (MABA) online database at Sky Island Alliance in Tucson. All photo-vouchered specimens documented by JCR in the study area have been submitted to both the UAZ collection and the MABA database.

In addition to our own work, we perused herpetological and other literature, talked to others working at

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The vegetation communities of the NJR are dominated by foothills thornscrub below about 2953 ft (900 m) and oak woodlands (Felger et al. 2001) above that, forming a temperate-subtropical ecotone.

the Reserve, and searched Sonoran data from 24 herpetological museum collections to determine if others had conducted amphibian or reptile inventories in our study area, and if so, what they found.

## Results and Discussion

### Museums and Literature

Our perusal of 24 herpetological collections yielded over 31,200 specimen records for Sonora, but no definitive evidence that any herpetological inventories or collecting had been conducted specifically at the Reserve prior to our work. Considerable collecting has occurred in the Nácori Chico area, about 30 km NE of the northern Reserve boundary; however, in our study area, museum data indicated only moderate collecting activity—primarily to the south and southeast of the Reserve boundary near Sahuaripa (see Table 1, which includes catalogue numbers and locations of collections mentioned below). In September 1959, G. O. Gates collected *Aspidoscelis costata*, *Callisaurus draconoides*, and *Incilius mazatlanensis* at Sahuaripa, and *Phrynosoma solare* “8.5 miles” (14 km) west of Sahuaripa (note—names used here are current names for these taxa, but may not reflect nomenclature in museum data). V. D. Roth and R. D. Krzman collected a *Phrynosoma solare* 4 miles (6.4 km) south of Sahuaripa in May 1970. A more ambitious collecting expedition occurred during July 1975 within approximately 1-2 miles (1.6-3.0 km) of Sahuaripa that included Allen E. Greer, P. Greer, John Wright, and James L. Patton. During that expedition, “*Rana pipiens*” (the name used for most leopard frogs at that time), *I. alvarinus*, *I. mazatlanensis*, *Smilisca fodiens*, *Kinosternon sonoriense*, *A. burti*, *Callisaurus draconoides*, *P. solare*, *Sceloporus clarkii*, *Urosaurus ornatus*, *Coluber flagellum*, and *Rhinocheilus lecontei* were all collected. In February 1987, Dean Hendrickson collected an *Ambystoma rosaceum* “24 miles” (39 km) east of Sahuaripa on the road to Nátora (which is close to or perhaps the same site as where JEW observed this species in 2005—see Table 1). Hendrickson’s classic work on the fishes of the Río Yaqui basin, conducted during that time frame, took him and his colleagues to many remote localities in Sonora and western Chihuahua; however, they visited no other localities on or near the Reserve (see Figure 3 in Hendrickson et al. 1980). In June 2001, Tod Reeder collected “*Rana yanapaiensis*” from 1.2 miles (2 km) north of Sahuaripa; however frogs collected both upstream (at the Ríos Yaqui/Sahuaripa confluence) and downstream (Arroyo San Ignacio, a tributary to



Figure 2. Arroyo Babisal just south of Rancho Babisal, Northern Jaguar Reserve. Vegetation is dry-season foothills thornscrub on the slopes and riparian in the canyon bottom. Photo by J. Rorabaugh.

the Río Sahuaripa) of that locality were determined through genetic analysis to be the morphologically similar *Litobates magnaocularis* (Oláh-Hemmings et al. 2009). In a personal communication to JCR, Julio Lemos Espinal reported a *Heloderma horridum* from near Sahuaripa (see Rorabaugh 2008), which is the northern-most record for that species.

The only other collection that may have occurred on or very close to the Reserve is a *Heloderma horridum* collected by John Wright from “25.5 miles” (41.0 km) south by road from Los Chinos (LACM 109953). A 2002 map from the Secretaría de Comunicaciones y Transportes shows a Los Chinos near Rancho Dubaral on the Reserve and another several km east of the Río Aros and southeast of the Reserve boundary. Rancho Los Chinos lies along the Río Aros between Arroyo Bonito and Chino Gordo, and the Sierra Los Chinos lies just southwest of the Reserve (Figure 1). The problem with the LACM record is that it does not indicate from which Los Chinos this lizard was collected. In fact, according to Google maps, there is another Los Chinos located about halfway between Mazatán and the Tecoripa junction on Highway 16, far to the southwest of the Reserve, which seems a more likely place to encounter *H. horridum*. However, if Wright’s Los Chinos is in the area depicted in Figure 1, it would be a significant collection and may represent a range extension north from Lemos-Espinal’s Sahuaripa locality.

### Observations by the Authors, Range Extensions, and Other Remarks

Our own observations and, in some cases, observations by others, are documented in Table 1. A sampling of species we observed are illustrated in Figures 3-9.

Our perusal of 24 herpetological collections yielded over 31,200 specimen records for Sonora, but no definitive evidence that any herpetological inventories or collecting had been conducted specifically at the NJR prior to our work.

Table 1. Amphibians and reptiles of the Northern Jaguar Reserve and vicinity. Localities indicated with an asterisk are near, but not on the Reserve. Nomenclature follows Liner and Casas-Andreu (2008) except where noted.

| Scientific Name                            | Common Names  | Location   | Habitat  | Source <sup>1</sup>   |
|--|---|--|--|---|
| <b>AMPHIBIA</b>                            |   |  |  |   |
| <b>CAUDATA</b>                             |   |  |  |   |
| <b>AMBYSTOMATIDAE</b>                      |   |  |  |   |
| <i>Ambystoma rosaceum</i>                  | Ajolote Tarahumara, Tarahumara Salamander                           | 10 km SW Nátora*, 24 mi E of Sahuaripa on rd to Nátora* (note – these may be the same locality)  | Oak woodland                                     | O'Brien et al. 2006; ASU 24134  |
| <b>ANURA</b>                               |   |  |  |   |
| <b>BUFONIDAE</b>                           |   |  |  |   |
| <i>Anaxyrus punctatus</i>                  | Sapo de Puntos Rojos, Red-spotted Toad                              | Widespread on the NJR  | Riparian in thornscrub                           | O'Brien et al. 2006; Rorabaugh & others   |
| <i>Incilius alvarius</i> <sup>2</sup>      | Sapo del Desierto de Sonora, Sonoran Desert Toad                    | Rancho Los Pavos, Río Aros (Carrizoso, El Toro), 2.6 mi W Sahuaripa*, between Rancho La Ventana and Rancho Babisal, Rancho Los Pavos               | Riparian in thornscrub, thornscrub               | O'Brien et al. 2006; Rick Williams; MVZ 136538; T.R. Van Devender; Diana Zamora       |
| <i>Incilius mazatlanensis</i> <sup>2</sup> | Sapo de Mazatlán, Sinaloa Toad                                      | Río Aros (Nátora*, Tunapa*, Buena Vista*), Arroyo La Ventana, Sahuaripa*, 2.6 mi W Sahuaripa*, Rancho Los Pavos, Arroyo Babisal                    | Riparian in thornscrub                           | O'Brien et al. 2006; Rorabaugh; UAZ 11818; MVZ 136532; T.R. Van Devender; S.L. Minter |
| <b>CRAUGASTORIDAE</b>                      |   |  |  |   |
| <i>Craugastor augusti</i>                  | Sapo Ladrador, Barking Frog   | Rancho Dubaral, Rancho Babisal   | Riparian, thornscrub                             | S.L. Minter; Gómez  |
| <b>HYLIDAE</b>                             |   |  |  |   |
| <i>Hyla arenicolor</i>                     | Ranita de las Rocas, Canyon Treefrog                                | Arroyos La Ventana, Dubaral, Babisal, Río Aros (near Dubaral, Chino Gordo*, Carrizoso), Río Yaqui (Fig Fall*, Los Alisos*)                         | Riparian in thornscrub                           | O'Brien et al. 2006; Rorabaugh; S.L. Minter   |
| <i>Smilisca fodiens</i>                    | Rana Chata, Lowland Burrowing Tree Frog                             | Just N Sahuaripa*, Rancho Babisal  | Thornscrub                                       | MVZ 136476-9; Gómez & S.L. Minter   |
| <b>MICROHYLIDAE</b>                        |   |  |  |   |
| <i>Gastrophryne olivacea</i>               | Ranita Olivo, Western Narrow-mouthed Toad                           | Río Aros (La Ciénega*, Carrizoso), Arroyo La Tinaja (~1 km N Rancho Babisal)   | Riparian in thornscrub                           | O'Brien et al. 2006, S.L. Minter  |
| <b>RANIDAE</b>                             |   |  |  |   |
| <i>Lithobates magnaocularis</i>            | Rana Leopardo del Noroeste de México, Northwest Mexico Leopard Frog | Arroyo La Ventana, Ríos Yaqui/Sahuaripa confluence*  | Riparian in thornscrub                           | Rorabaugh; Oláh-Hemmings et al. 2009  |
| <i>Lithobates tarahumarae</i>              | Rana Tarahumara, Tarahumara Frog                                    | Arroyo La Ventana, Arroyo Babisal (just S Rancho Babisal), Río Aros (La Cienega*)  | Riparian in thornscrub                           | O'Brien et al. 2006; Rorabaugh  |
| <i>Lithobates yavapaiensis</i>             | Rana Leopardo de Yavapai, Lowland Leopard Frog                      | Cattle tanks on the NJR, Río Aros (below Rancho Dubaral, Arroyo Bonito*, Carrizoso, Los Lobos), Rancho Dubaral, 10 mi SW Nátora*                   | Riparian in thornscrub and oak woodland          | O'Brien et al. 2006; Rorabaugh; S.L. Minter   |
| <b>REPTILIA</b>                            |   |  |  |   |
| <b>TESTUDINES</b>                          |   |  |  |   |
| <b>EMYDIDAE</b>                            |   |  |  |   |
| <i>Terrapene nelsoni</i>                   | Caja de Manchas, Spotted Box Turtle                                 | Río Aros (Buena Vista*, Los Lobos), Rancho Las Cuevas*   | Thornscrub                                       | O'Brien et al. 2006; S.L. Minter & Gomez  |
| <i>Trachemys yaquia</i>                    | Jicotea del Yaqui, Yaqui Slider                                     | Río Aros (Buena Vista)*, Río Yaqui (Fig Fall)*   | Riverine in thornscrub                           | O'Brien et al. 2006   |
| <b>KINOSTERNIDAE</b>                       |   |  |  |   |
| <i>Kinosternon sonoriense</i>              | Casquito de Sonora, Sonora Mud Turtle                               | Arroyo La Ventana (just NE of Rancho La Ventana), 10 mi SW of Nátora*, Río Aros (Tunapa*, La Cienega*, Chino Gordo*, Los Lobos), Just N Sahuaripa* | Riparian/riverine in thornscrub and oak woodland | Rorabaugh; O'Brien et al. 2006; MVZ 136789  |
| <b>TESTUDINAE</b>                          |   |  |  |   |
| <i>Gopherus morafkai</i> <sup>3</sup>      | Galápago del Desierto, Morafka's Desert Tortoise                    | Sierra Los Chinos*, Rancho Los Pavos   | Thornscrub                                       | Gómez & Gutierrez; T.R. Van Devender  |
| <b>SQUAMATA</b>                            |   |  |  |   |
| <b>LACERTILIA</b>                          |   |  |  |   |
| <b>HELODERMATIDAE</b>                      |   |  |  |   |
| <i>Heloderma horridum</i>                  | Escorpión, Beaded Lizard  | Sahuaripa*   | Thornscrub                                       | J. Lemos Espinal in Rorabaugh (2008)  |



Table 1 continued.

| Scientific Name                 | Common Names   | Location   | Habitat  | Source <sup>1</sup>  |
|---------------------------------|--|--|--|--|
| <i>Heloderma suspectum</i>      | Monstruo del Gila, Gila Monster                        | Rancho Dubaral, on road between El Río (near Ríos Yaqui/Sahuaripa confluence) and Sahuaripa*   | Thornscrub                                       | Gómez & Gutierrez; O'Brien et al. 2006   |
| <b>IGUANIDAE</b>                |  |  |  |  |
| <i>Ctenosaura macrolopha</i>    | Garrobo de Sonora, Sonoran Spiny-tailed Iguana         | Rancho Los Pavos, Rancho Dubaral, near Rancho Babisal  | Thornscrub                                       | Rorabaugh, S.L. Minter   |
| <b>PHRYNOSOMATIDAE</b>          |  |  |  |  |
| <i>Callisaurus draconoides</i>  | Cachora Arenera, Zebra-tailed Lizard                   | Widespread on the NJR, Just N of Sahuaripa*, Sahuaripa*  | Thornscrub                                       | All, MVZ 136667-70; UAZ 01413, 01464, 01423, 01418                               |
| <i>Crotaphytus nebrius</i>      | Cachorón de Sonora, Sonoran Collared Lizard            | Rancho Los Pavos   | Thornscrub                                       | Gómez & Gutierrez  |
| <i>Elgaria kingii</i>           | Lagartija Lagarto de Montaña, Madrean Alligator Lizard | Rancho Babisal   | Riparian in thornscrub                           | Gómez & Gutierrez  |
| <i>Holbrookia elegans</i>       | Lagartija Sorda Elegante, Elegant Earless Lizard       | Widespread   | Thornscrub                                       | All  |
| <i>Phrynosoma ditmarsii</i>     | Camaleón de Roca, Rock Horned Lizard                   | Sierra Lampazos, ~33 km SW Rancho Los Pavos*   | Oak woodland- thornscrub ecotone                 | Samia Carillo-P. and Reyna Castillo-G.   |
| <i>Phrynosoma solare</i>        | Camaleón Real, Regal Horned Lizard                     | Arroyo Babisal, Dubaral near Río Aros, 2.6 mi W Sahuaripa*, just N Sahuaripa*, 4.4 mi S Sahuaripa*, 4 mi S Sahuaripa*, between Ranchos Babisal and Dubaral | Thornscrub, riparian in thornscrub               | Rorabaugh; MVZ 136699-704; UAZ 32980; T.R. Van Devender                          |
| <i>Sceloporus clarkii</i>       | Bejori de Clark, Clark's Spiny Lizard                  | Widespread on the NJR, Just N Sahuaripa*   | Thornscrub, riparian in thornscrub               | All, MVZ 136734-8  |
| <i>Sceloporus horridus</i>      | Chintete Gris, Rough Lizard                            | Arroyo Santa Rosa/Rancho Santa Rosa*   | Thornscrub                                       | Rick Williams  |
| <i>Urosaurus ornatus</i>        | Roñito Ornado, Ornate Tree Lizard                      | Widespread on the NJR, Just N Sahuaripa*, 2.4 mi W Sahuaripa*, 2 km N Sahuaripa*   | Thornscrub, riparian in thornscrub               | All; MVZ 136633-6; MZFC-UNAM 15130-1   |
| <b>SCINCIDAE</b>                |  |  |  |  |
| <i>Plestiodon callicephalus</i> | Lincer de Barranco, Mountain Skink                     | Arroyo La Ventana, Arroyo Babisal, Arroyo La Tinaja (~1 km N Rancho Babisal), Mesa Encinoso (2.86 km NW Rancho La Ventana)                                 | Thornscrub, riparian in thornscrub; oak woodland | Rorabaugh; S.L. Minter; C. Hinojo-Hinojo; T.R. Van Devender; A.L. Reina-Guererro |
| <i>Plestiodon obsoletus</i>     | Lincer de Llanura, Great Plains Skink                  | Río Aros (Buena Vista*)  | Riparian in thornscrub                           | O'Brien et al. 2006  |
| <b>TEIIDAE</b>                  |  |  |  |  |
| <i>Aspidoscelis burti</i>       | Huico Manchado del Cañón, Canyon Spotted Whiptail      | Rancho Dubaral, Arroyo Babisal, Just North of Sahuaripa*   | Thornscrub, riparian in thornscrub               | Rorabaugh; S.L. Minter; MVZ 136750-61  |
| <i>Aspidoscelis costata</i>     | Huico Llanero, West Mexico Whiptail                    | 1 mi N Sahuaripa*, Sahuaripa*  | Thornscrub                                       | LACM 121391-6; UAZ 06696-7   |
| <i>Aspidoscelis sonorae</i>     | Huico Manchado de Sonora, Sonoran Spotted Whiptail     | NJR and vicinity, widespread   | Thornscrub                                       | Rorabaugh  |
| <b>SERPENTES</b>                |  |  |  |  |
| <b>BOLIDAE</b>                  |  |  |  |  |
| <i>Boa constrictor</i>          | Mazacoatl, Boa constrictor                             | Sierra Los Chinos*, Rancho Los Pavos   | Thornscrub                                       | Gómez & Gutierrez  |
| <b>COLUBRIDAE</b>               |  |  |  |  |
| <i>Coluber bilineatus</i>       | Látigo de Sonora, Sonoran Whipsnake                    | Rancho La Ventana  | Thornscrub                                       | Gómez & Gutierrez  |
| <i>Coluber flagellum</i>        | Chirriónera, Coachwhip                                 | Near Rancho Babisal, Just N Sahuaripa*, Rancho La Ventana, Rancho Las Cuevas*  | Thornscrub                                       | S. Richardson; E. Fernandez; MVZ 136779; Gómez & Gutierrez                       |
| <i>Coluber mentovarius</i>      | Sabanera, Neotropical Whipsnake                        | Arroyo La Ventana  | Thornscrub                                       | Student at Amphibian Workshop as told to Rorabaugh                               |
| <i>Diadophis punctatus</i>      | Culebra de Collar, Ring-necked Snake                   | Rancho La Ventana  | Thornscrub                                       | Gómez  |
| <i>Drymarchon melanurus</i>     | Palancacóatl, Central American Indigo Snake            | Río Aros (Tunapa*), Chino Gordo*, Carrizoso), Arroyo El Güijalo, Rancho La Ventana   | Riparian in thornscrub                           | O'Brien et al. 2006; S.L. Minter; A. Hannuksela                                  |
| <i>Hypsiglena chlorophaea</i>   | Nocturna Verde Oscuro, Desert Nightsnake               | Rancho La Ventana  | Thornscrub                                       | Gómez & Gutierrez  |
| <i>Oxybelis aeneus</i>          | Bejuquilla Parda, Brown Vinesnake                      | Spring N of Rancho Los Pavos   | Thornscrub                                       | Rorabaugh  |

Table 1 continued.

| Scientific Name                         | Common Names   | Location  | Habitat                            | Source <sup>1</sup>                            |
|---|--|---|------------------------------------|--|
| <i>Pituophis catenifer</i>              | Cincuate Casero, Gopher Snake                        | Arroyo Babisal, Rancho El Agua Fria*                            | Riparian, thornscrub               | Rorabaugh; Gómez & Gutierrez                   |
| <i>Rhinocheilus lecontei</i>            | Culebra Nariz-larga, Long-nosed Snake                | Rancho Babisal  | Riparian in thornscrub             | Rorabaugh; Gómez & Gutierrez                   |
| <i>Salvadora hexalepis</i>              | Cabestrillo, Western Patch-nosed Snake               | Río Aros near Dubaral   | Riparian in thornscrub             | Rorabaugh                                      |
| <i>Senticolis triaspis</i>              | Culebra Ratonera Verde, Green Ratsnake               | Ranchos La Ventana and Babisal                                  | Thornscrub                         | Gómez & Gutierrez                              |
| <i>Tantilla yaquia</i>                  | Culebra Cabeza Negra Yaqui, Yaqui Black-headed Snake | Río Yaqui (Los Pavos*)  | Thornscrub                         | O'Brien et al. 2006                            |
| <i>Thamnophis cyrtopsis</i>             | Jarretera Cuello-negro, Black-necked Gartersnake     | Río Aros (La Cienega*), Rancho Babisal                          | Riparian in thornscrub             | O'Brien et al. 2006; Gómez & Gutierrez         |
| <i>Trimorphodon lambda</i> <sup>4</sup> | Ilimacoa de Sonora, Sonoran Lyresnake                | Río Aros near Dubaral   | Riparian in thornscrub             | Rorabaugh                                      |
| <i>Trimorphodon tau</i>                 | Falsa Nauyaca Mexicana, Mexican Lyresnake            | Rancho La Ventana   | Mesquite thicket in thornscrub     | Rorabaugh (in press)                           |
| <b>ELAPIDAE</b>                         |  |   |                                    |  |
| <i>Micrurus distans</i>                 | Coralillo Bandas Claras, West Mexican Coralsnake     | Sierra Los Chinos, 17.5 km NNE Sahuaripa*                       | Thornscrub                         | Rorabaugh et al. (in press)                    |
| <b>VIPERIDAE</b>                        |  |   |                                    |  |
| <i>Crotalus molossus</i>                | Cascabel Serrana, Black-tailed Rattlesnake           | Rancho Babisal, on road between Ranchos La Ventana and Babisal. | Thornscrub, riparian in thornscrub | Rorabaugh; Gómez; D.M. Kramer and H. Duarte-R. |
| <i>Crotalus tigris</i>                  | Cascabel Tigre, Tiger Rattlesnake                    | Sierra Los Chinos*  | Thornscrub                         | Gómez  |

<sup>1</sup>Literature, museum specimens, and names of those making observations constitute sources.

<sup>2</sup>Following Frost et al. (2009), we use *Incilius* instead of *Ollotis* for the genus of these species.

<sup>3</sup>We follow Murphy et al. (2011) in recognizing *Gopherus morafkai* as a species distinct from *G. agassizii*.

<sup>4</sup>We follow Devitt et al. (2008) in recognizing *Trimorphodon lambda* as a species separate from *T. biscutatus*.



Figure 3. Adult *Ctenosaura macrolopha* emerging from a tree cavity near Rancho Dubaral. Photo by J. Rorabaugh.

These observations add seven species of amphibians and 27 species of reptiles to those documented by museum specimens. Represented are range extensions for *Trimorphodon tau* (Rorabaugh in press) of 67 miles (108 km) NNW of the closest known locality in eastern Sonora, which is at Santa Rosa, NE of Maycoba (T.R. Van Devender, pers. comm.); *Micrurus distans* (Rorabaugh et al. in press) 62 miles (100 km) NNW of the closest known locality at 2.3 miles (3.7 km) by Highway 16 east of the Río Maycoba between Yécora and Maycoba (Van Devender and Enderson 2007); and *Drymarchon melanurus* 42 miles (68 km) NE of the nearest known locality at “10 miles” (16 km) north of the dam on the Río Yaqui at Novillo (UAZ 38376). In addition, the *Plestiodon obsoletus* from Buena Vista on the Río Aros is only the seventh record of this species in Sonora, and represents a southeastern range extension of 37 miles (60 km) from the next nearest collection, which is at “11 miles” (18 km) west of Husabas (CAS-SUR 14330) and is 102 miles (164 km) east of the southern-most record at 21 miles (34 km) east of Hermosillo (UAZ 49170). Unfortunately, this individual escaped before it could be photo-vouchered, but a positive visual identification of this morphologically distinct lizard was made by JEW.

On the Northern Jaguar Project website ([www.northernjaguarproject.org](http://www.northernjaguarproject.org)), there is a photograph of *Sceloporus horridus* taken by Rick Williams at Arroyo Santa Rosa on Rancho Santa Rosa to the southwest of the Reserve (Figure 1). Of museum specimens assigned to *Sceloporus*

On the Northern Jaguar Project website, there is a photograph of *Sceloporus horridus* taken by Rick Williams at Arroyo Santa Rosa on Rancho Santa Rosa to the southwest of the Reserve. Of museum specimens assigned to *Sceloporus horridus*, the closest records in Sonora are from La Poza, which is about 17 miles (27 km) south of Hermosillo; and just east of San Nicolás on Highway 16.





Figure 4: Exceptionally blue, male *Urosaurus ornatus* battling it out on a mesquite trunk in Arroyo La Ventana. Photo by J. Rorabaugh.

*rus horridus*, the closest records in Sonora are from La Poza (MZFC-UNAM 3885), which is about 17 miles (27 km) south of Hermosillo; and just east of San Nicolás on Highway 16 (MZFC-UNAM 15176). The Arroyo Santa Rosa record may represent a significant northeastern range extension; however, museum records include specimens of “*Sceloporus spinosus*” from “40 miles” (64 km) north of Hermosillo (CAS 89747) and the Sierra de Oposura (=Sierra de Madera, MCZ R-6763), which are significantly to the northwest and north of Rancho Santa Rosa, respectively. *Sceloporus spinosus* is a species of the Mexican Plateau that does not occur in Sonora, but is similar in appearance to *S. horridus*. These specimens would need to be examined before the lizard found at Arroyo Santa Rosa could be pronounced a range extension.

Many of our observations, although not extending the ranges or documenting new habitats used, help define the distribution of species for which there are few Sonoran specimens or localities, and/or distribution is poorly defined in east-central Sonora. Examples include our observations of *Craugastor augusti*, *Gopherus morafkai*, *Terrepene nelsoni*, *Crotaphytus nebrius*, *Diadophis punctatus*, *Oxybelis aeneus*, *Senticolis triaspis*, and *Tantilla yaquia*.

A juvenile *Phrynosoma ditmarsii* was photographed by Samia Carrillo-Percástegui and Reyna Castillo-Gámez in the Sierra Lampazos west of the Río Yaqui roughly

20.5 miles (33 km) SW of Rancho Los Pavos. We found this image on the Northern Jaguar Project website and TVD tracked down the photographer. This represents only the sixth locality for this species. The lizard was found in an ecotone between thornscrub and oak woodland or savannah. This locality is on the edge or outside of the area shown on Figure 1.

The Reserve is at or near a distributional boundary between two very morphologically similar and closely related leopard frogs: *Litlobates magnaocularis* and *L. yavapaiensis*. We have seen these species at numerous sites and examined hundreds of individuals. By employing a combination of characters and examining a series of specimens or individuals, one can make an educated judgement about which species is at a site, but we are uncertain just how reliable this type of assessment is, and it is unlikely to work with individual frogs. Frost and Bagnara (1976) noted that ventral yellow coloration is negligible in *L. magnaocularis* as compared to *L. yavapaiensis*; and although we agree that *L. magnaocularis* is less likely to have ventral yellowing, it is not a dependable character for distinguishing individuals. However, the rear of the thigh of a small percentage of *L. magnaocularis* is all black or nearly so—a character we have not seen in *L. yavapaiensis*. In general, the thigh pattern of *L. magnaocularis* tends to be quite variable, but is most often an open and relatively light reticulation—similar to *L. berlandieri* or *L. blairi*, whereas *L. yavapaiensis* typically possesses a tighter and darker (often brown) reticulation. Breeding, adult male *L. magnaocularis* also have prominent vocal sacs (nearly nonexistent in *L. yavapaiensis*), and their calls are somewhat louder and may contain more snores and fewer stuttering chuckles as compared to *L. yavapaiensis*. Based on these characters, most of the leopard frogs we have encountered at and near the Reserve we believe to be *L. yavapaiensis*; however, frogs from Arroyo La Ventana, including just upstream of Rancho

Many of our observations, although not extending the ranges or documenting new habitats used, help define the distribution of species for which there are few Sonoran specimens or localities, and/or distribution is poorly defined in east-central Sonora.



Figure 5. *Trimorphodon tau* with distinctive light collar on the neck. From Rancho La Ventana. This individual is very pale with a washed out pattern compared to the vividly patterned specimens from southeastern Sonora. Photo by J. Rorabaugh.



Figure 6. *Incilius mazatlanensis* from Rancho Los Pavos. Photo by M. Gómez-Ramírez.



Figure 7. *Rhinocheilus lecontei* from Rancho Babisal. The other individual found at this locale had more red in the light bands, more closely resembling specimens from southern Sonora. Photo by J. Rorabaugh.

La Ventana and a reach 0.4 miles (0.6 km) southeast of Rancho La Ventana on the southern boundary of the Reserve have been assigned herein to *L. magnaocularis*. These determinations should be considered tentative and need to be confirmed through genetic analysis. The only such analysis conducted in the study area was on frogs collected at the confluence of the Ríos Yaqui and Sahuaripa, which were confirmed to be *L. magnaocularis* (Oláh-Hemmings et al. 2009).

As with the leopard frogs, our classification of *Aspidoscelis* species should be considered tentative. O'Brien et al. (2006) found *Aspidoscelis* to be the most common surface-dwelling reptile at their sites, but did not assign them to species. Individuals observed at Ranchos Babisal and Dubaral were assigned to *A. burti*, and others observed in the Reserve interior were thought to be *A. sonorae*. However, *A. costata* occurs in this region, and *A. burti*, in particular, can be confused with this species. Both *A. costata* and *A. burti* have been collected near Sahuaripa (see discussion above).

Herpetologists collecting in the Alamos region of Sonora have often noted how different *Rhinocheilus* is

there compared to more northern locales. Southern Sonora *Rhinocheilus* are relatively large and strikingly-colored snakes with distinct broad and dark saddles averaging 17 on the body. The taxonomy of these snakes has long been debated. Once considered a subspecies (*R. lecontei antonii*, Klauber 1941), Manier (2004) concluded that the morphological characters of this southern form were not sufficiently distinct to warrant subspecific status. However, Lemos-Espinal et al. (2004) considered *antonii* to be a full species. In Table 1, we accept the conclusion of Liner and Casas-Andreu (2008), who follow Manier (2004). However, if *antonii* is resurrected in the future as a subspecies or species, the specimens we found at the Reserve are consistent with that taxon. One specimen from Arroyo Babisal was not as colorful as southern Sonora *Rhinocheilus*, but the banding pattern matched *antonii* (Figure 7). Another specimen from that locale more closely resembled southern Sonora *Rhinocheilus* in coloration and pattern.

David M. Kramer photographed a small, dark snake along the Río Aros at Rancho Los Chinos between Arroyo Bonito and Chino Gordo (see Figure 1) that he described as a “threadsnake” (= *Leptotyphlops* or *Rena*). Unfortunately, the poor quality of the image defies identification, but it may be a *Ramphotyphlops braminus*, a species known in Sonora only from Hermosillo, and only as an introduction (Quijada-Mascareñas and Enderson 2007). Its presence in a remote area, such as the Reserve is unexpected. In the same area, Kramer encountered a coralsnake; he believed it was likely a *Micruroides euryxanthus*, but a small *Micrurus distans* cannot be ruled out. *Micruroides euryxanthus* would be a new species for the study area.

We expect numerous other species of amphibian and reptiles will be found in the study area. Species for which records exist on two or more sides of the study area in similar habitats, and which we believe are very likely to occur in the area, include *Scaphiopus couchii*, *Kinosternon integrum*, *Anolis nebulosus*, *Leptotyphlops humilis*, *Gyalopium quadrangulare*, *Lampropeltis getula*, *Thamnophis eques*, *Micruroides euryxanthus*, and *Crotalus atrox*.

### Summary

The herpetofauna of the Reserve and adjacent areas as depicted in Figure 1, is a derivation of both temperate and subtropical assemblages, with many species typical of the foothills of the Sierra Madre Occidental. Included are 11 species of amphibians and 40 species of reptiles. The Reserve proper is now known to support 10 species of amphibians and 31 species of reptiles. Our results are preliminary, and likely a variety of additional species will be found in the study area over time. The oak woodlands, in particular, are poorly sampled; most of the roads, camps, and ranchos are in foothills thornscrub thus resulting in a sampling/observational bias of species from this biotic community. Sampling during the summer rainy season is likely

The herpetofauna of the NJR and adjacent areas as depicted in Figure 1, is a derivation of both temperate and subtropical assemblages, with many species typical of the foothills of the Sierra Madre Occidental. Included are 11 species of amphibians and 40 species of reptiles. The NJR proper is now known to support 10 species of amphibians and 31 species of reptiles.



to be most productive, but is also when the roads are least passable.

**Acknowledgements.** We thank Naturalia for granting access to the Reserve. The following individuals assisted with surveys: Juan Carlos-Bravo, Samia Carrillo-Percástegui, Reyna Castillo-Gámez, Gerardo Carreón, H. Duarte-Robles, Erin Fernandez, Adam Hannuksela, C. Hinojo-Hinojo, Abigail King, David M. Kramer, Stephen L. Minter, Ana Lilia Reina-Guererro, Scott Richardson, and Diana Zamora-Barcenas. Rick Williams provided photos of *Sceloporus horridus* and *Incilius alvarius* that he observed. George Ferguson identified the *S. horridus* photographed by Rick Williams. Megan “Turtle” Southern assisted with field work, provided the base map for Figure 1, and helped track down information about amphibian and reptile photos on the Northern Jaguar Project website.

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Figure 8. *Crotalus molossus* at Rancho Babisal. Although threatening, this individual was readjusting its jaws after its head had been pinned with a snake stick. Photo by J. Rorabaugh.



Figure 9. *Terrapene nelsoni* found inside a downed palm log at Rancho Las Cuevas. Photo by M. Gómez-Ramírez.

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## BOARD MEETING MINUTES

### Tucson Herpetological Society Board of Directors Meeting Minutes

27 September 2011 – 7 p.m.  
U of A B105/Keating Building  
1657 E. Helen Street

#### Directors present:

Trevor Hare (President)  
Robert Villa (VP)  
Heidi Flugstad (Treasurer)  
Rob Nixon (Director)  
Taylor Edwards (Past President)

#### Directors absent:

Kris Ratzlaff (Secretary)  
Tim Allen (Director)  
Robin Llewellyn (Director)  
Travis Boswell (Director)  
Dennis Caldwell (Director)

#### Members Present: Ed Moll

#### Minutes of July/August 2011 Meeting:

Due to the proximity of the Current Research on the *Herpetofauna of the Sonoran Desert V*, July's BOD meeting was dedicated to CRHSD5 planning. In August, there were not enough members present for a quorum.

**Treasurer's Report** (Flugstad): Edwards motioned to approve the report, Nixon seconded. Passed.

#### Committee Reports

**Homepage** (Tuegel) – Nothing to report.  
**Conservation** (Caldwell) – Nothing to report.  
**Speakers Bureau** (Villa/Moll):

*11 August:* Robert Villa and Erin Olmstead (Tucson Audubon Society) promoted the Tucson Bird & Wildlife Festival on KGUN9 TV's Morning Blend talk show.

*20-21 August:* Robert Villa staffed a table at the Tucson Bird & Wildlife Festival with a gophersnake, kingsnake, a box turtle and THS literature.

*14 September:* Ed Moll gave a live reptile presentation to 10 children and 3 staff at the House of Neighborly Service.

*20 September:* Ed Moll talked on the importance of reptiles using live animals to 30 children and 2 staff of an afterschool group at Walker School.

*20 September:* Robert Villa and Mark Wolfson (Tucson Reptile Show and Sale) were interviewed on Arizona Public Media (KUAT TV)'s Arizona Illustrated to promote native and captive herpetofauna.

*24-25 September:* Robert Villa staffed a table at the Tucson Reptile Show and Sale with THS literature.

Volunteers sought for the National Geographic BioBlitz at Saguaro National Park West on *21-22 October*. Contact Robert Villa (cascabel1985@gmail.com).

**Sonoran Herpetologist** (Clark) – Looking for submissions.

**Membership** (Llewellyn) – Nothing to report.

**Program** (Villa):

July – Ann Devon-Song  
August – Jim Dixon  
September – Justin Congdon  
October – Justin Schmidt  
Onward – TBD

**C.H. Lowe Fund** (Hare) – Nothing to report.

**Student Chapter of the THS** (Hare) – Nothing to report.

Board of Directors meetings are always on the last Tuesday of each month (except December), at 7:00 PM; University of Arizona, B105/Keating Building, 1657 East Helen Street.

**Jarchow Conservation Award** – Likely will not be awarded due to time constraints (no organizing committee)

**Mexican Tortoise Project** (Vaughn) – Taylor Edwards made a motion that was approved pending the final wording in the agreement that the current project be expanded to include other *Gopherus* species besides Desert Tortoises (specifically *G. flavomarginatus*). Thus, the official project title will change from: THS Sonora, Mexico Desert Tortoise Project to: THS Mexican Tortoise Project.

No other changes to the agreement or the administrative understandings were made and collaborators will conduct all business as has previously been done according to the original agreement.

### Old Business

1. Current Research on the Herpetofauna of the Sonoran Desert

2. Tucson Herp Count

### New Business

Villa funding request – Request of travel (gas) expenses for a Madrean Archipelago Biodiversity Assessment (Sky Island Alliance and Veolia) will be deferred to C.H. Lowe Fund.

Elections – Elections chair is sought.

**Motion to adjourn was made**

## Tucson Herpetological Society Board of Directors Meeting Minutes

25 October 2011 – 7 p.m.

U of A B105/Keating Building  
1657 E. Helen Street

### Directors present:

Robert Villa (VP)  
Heidi Flugstad (Treasurer)  
Rob Nixon (Director)  
Tim Allen (Director)  
Robin Llewellyn (Director)  
Dennis Caldwell (Director)

### Directors absent:

Trevor Hare (President)  
Taylor Edwards (Past President)  
Kris Ratzlaff (Secretary)  
Travis Boswell (Director)

**Members Present:** Ed Moll

**Minutes of September 2011 Meeting:** Nixon moved, Flugstad seconded. Approved.

**Treasurer's Report** (Flugstad) – Llewellyn moved, Caldwell seconded. Approved.

### Committee Reports

**Homepage** (Tuegel) – Nothing to report.

**Conservation** (Caldwell) – Dennis will draft a letter on behalf of THS for the public comment period of the Rosemont-Augusta mine proposal review process.

**Speakers Bureau** (Villa/Moll) –

*1 October:* Robert Villa staffed at table at Emily Gray Middle School and Lew Sorensen Community Center on snake awareness for their wellness event.

*10 October:* Ed Moll presented a program using live reptiles to 19 children (3 to 5 years old) and 3 staff at Walker Early Learning Center

*20 October:* Robert Villa walked with Michael Fay “worlds greatest living explorer” and National Geographic Explorer-in-Residence from Manzo Elementary in Barrio Hollywood to Gates Pass and Kinney Roads, counting species along the way. They encountered various lizards and a Black-tailed Rattlesnake.

*21-22 October:* Robert Villa and Hanna Strauss (CA THS member) staffed a table at Saguaro National Park for National Geographic's BioBlitz using various reptiles. Robert gave a talk on Sonoran Desert amphibians and reptiles on 22 October.

*26 October:* Ed Moll will present a three-hour training session on herpetology for docents-in-training at Tohono Chul Park.

**Sonoran Herpetologist** (Clark) – Looking for submissions.

**Membership** (Llewellyn) – Nothing to report.

**Program** (Villa) – November: Jon Davis; December: TBA

**C.H. Lowe Fund** (Hare) – Nothing to report.

**Student Chapter of the THS** (Hare) – Nothing to report.

**Jarchow Conservation Award** – Nothing to report.

**Mexican Tortoise Project** (Vaughn) – The board approved the name change from Mexican Tortoise Project to THS Mexican Tortoise Project. Flugstad motioned, Caldwell seconded.

### Old Business

1. Current Research on the Herpetofauna of the Sonoran Desert

2. Tucson Herp Count



**Villa funding request** – Request of travel (gas) expenses for a Madrean Archipelago Biodiversity Assessment (Sky Island Alliance and Veolia) will be deferred to C.H. Lowe Fund.

**THS Facebook Page** – René Clark and Robert Villa will start a Facebook page for THS.

**New Business**

**THS T-shirts** – Looking for volunteer(s) to store t-shirts and other minor THS merchandise.

**Elections** – Elections committee formed (Repp, Villa)

**Meeting adjourned. Caldwell moved, Nixon seconded.**

**MEMBERSHIP UPDATE**

**As of 10 December 2011**

**Membership Information**

|            |      |              |       |
|------------|------|--------------|-------|
| Individual | \$20 | Sustaining   | \$30  |
| Family     | \$25 | Contributing | \$50  |
| Student    | \$14 | Life         | \$500 |

The Tucson Herpetological Society would like to thank existing members and new members for renewing their membership. We appreciate your support and are always looking for members to actively participate in THS activities and volunteer opportunities. It is a great way to be involved with the conservation of amphibians and reptiles in the Sonoran Desert.

**Time to Renew Your THS membership?**

This is a friendly reminder for those of you whose membership is due. Please send your check and a membership form (especially if information has changed) to THS, P.O. Box 709, Tucson, AZ, 85702. If you are a new member, please include your email address with your payment to receive monthly newsletter online. A membership renewal form is attached for your convenience. We look forward to seeing you at the monthly meetings.

Thank you!  
Robin Llewellyn - Membership Director

**New Members**

New Members  
Howard McKinney  
Bruce Grant  
Warren Savary

**Individual Memberships**

Paul Hamilton  
Brian Sullivan  
Ron Sparks

**Memberships Due in November**

Emily Bennett  
Rusty & Peggy Buss  
Lainie Levick  
Janine R. McCabe  
Rob Nixon

**Student Membership**

Lee Roop (New member)

**Members Due in December**

Jay Cole & Carol Townsend  
John Gray  
Doug and Laurie Moore  
Justin and Li Shen Schmidt

**Tucson Herpetological Society  
P.O. Box 709, Tucson, Arizona 85702-0709  
MEMBERSHIP RENEWAL FORM**

NAME: \_\_\_\_\_ Date \_\_\_\_\_  
Address or Personal Information Changes \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**MEMBERSHIP DUES**

[ ] \$20 Individual [ ] \$25 Family [ ] \$14 Student [ ] \$30 Sustaining [ ] \$50 Contributing [ ] \$500 Life

\$ \_\_\_\_\_ Jarchow Conservation Award  
\$ \_\_\_\_\_ Flat-tailed horned lizard Fund

\$ \_\_\_\_\_ Speakers Bureau  
\$ \_\_\_\_\_ C.H. Lowe Herp Research Fund

\$ \_\_\_\_\_ Total (MAKE CHECK PAYABLE TO: TUCSON HERPETOLOGICAL SOCIETY)

The THS newsletter, the *Sonoran Herpetologist*, is delivered online only. Please indicate the email address you would like to receive the newsletter if you are not currently receiving the newsletter at your preferred address. If you are unable to receive the newsletter online, please contact Robin at [robinia2@msn.com](mailto:robinia2@msn.com). If not already done, please add my email to the [THS directory](#) and/or email [Monthly meeting announcement](#) (circle one or both). Please return this form with your check to the address above.

Email address \_\_\_\_\_



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**Editor-in-Chief**

Howard Clark, editor.sonoran.herp@gmail.com

**Associate Editors**

Roy Averill-Murray, averill-murray@sbcglobal.net  
Don Swann, donswann@dakotacom.net  
Robert Bezy, bezy@comcast.net  
Tim Allen, tallen@elmontgomery.com

**Art Editor**

Dennis Caldwell, dennis@caldwell-design.com

**Book Review Editor**

Philip Brown, philipandbarbara@earthlink.net

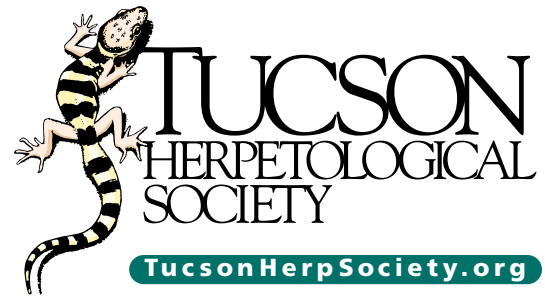
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Authors should submit original articles, notes, book reviews to the Editor, either via email using an attached word processed manuscript or by mail to the Society's address. The manuscript style should follow that of *Journal of Herpetology* and other publications of the Society for the Study of Amphibians and Reptiles. For further information, please contact the editor, at editor.sonoran.herp@gmail.com.

**Deadline for *Sonoran Herpetologist* 25(1): December 15**

*The Tucson Herpetological Society is dedicated to conservation, education, and research concerning the amphibians and reptiles of Arizona and Mexico.*

*Tucson Herpetological Society is a registered non-profit organization.*



**TucsonHerpSociety.org**

P.O. Box 709 Tucson, AZ 85702-0709

**Officers**

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**Secretary** Kris Ratzlaff, kratzlaf@email.arizona.edu

**Treasurer** Heidi Flugstad, heidi\_flugstad@hotmail.com

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Travis Boswell (2010-2011), sndscooters@yahoo.com

Tim Allen (2010-2011), tallen@elmontgomery.com

Robert Nixon (2011-2012), sapo1047@msn.com

Dennis Caldwell (2011-2012), dennis@caldwell-design.com

**Past President** Taylor Edwards, taylore@u.arizona.edu

**Society Activities**

**Monthly Members Meeting**

Robert Villa, Program Chair  
3rd Tuesday, 7:15 PM

**Board of Directors Meeting**

Last Tuesday of each month (except December), 7:00 PM  
University of Arizona, B105/Keating Building  
1657 East Helen Street

**Speakers Bureau** (scheduled presentations)

Robert Villa, Director  
Ed Moll, Director

**Conservation Committee**

Dennis Caldwell, Director

**Herpetological Information Hotline**

Bob Brandner 760-0574

**Jarchow Conservation Award**

Taylor Edwards, Chairperson

**Publications:**

*Sonoran Herpetologist*, *Backyard Ponds brochure*,  
*Living with Venomous Reptiles brochure*,  
*THS Herp Coloring Book*, *THS Collected Papers, 1988-1991*

**THS Internet World Wide Webpage**

<http://tucsonherpsociety.org>

Marty Tuegel, Webmaster, mtuegel@cox.net

For more information about the THS and the reptiles and amphibians of the Tucson area visit **tucsonherpsociety.org**