

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

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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

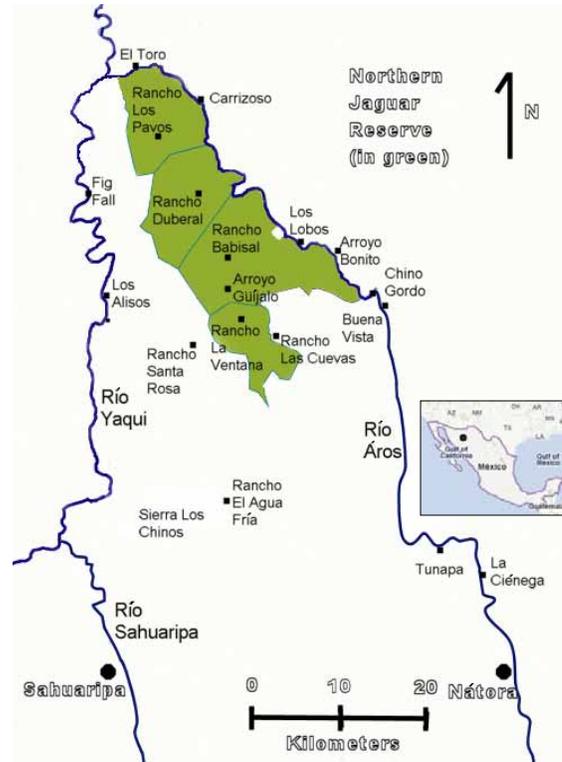


Figure 1. The Northern Jaguar Reserve and vicinity, which lies in east-central Sonora. The northern boundary of the Jaguar Reserve is 124 miles (200 km) SSE of the border at Douglas-Agua Prieta. Small inset: black dot marks general reserve location.

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 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 *Lithobates 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



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.

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 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.

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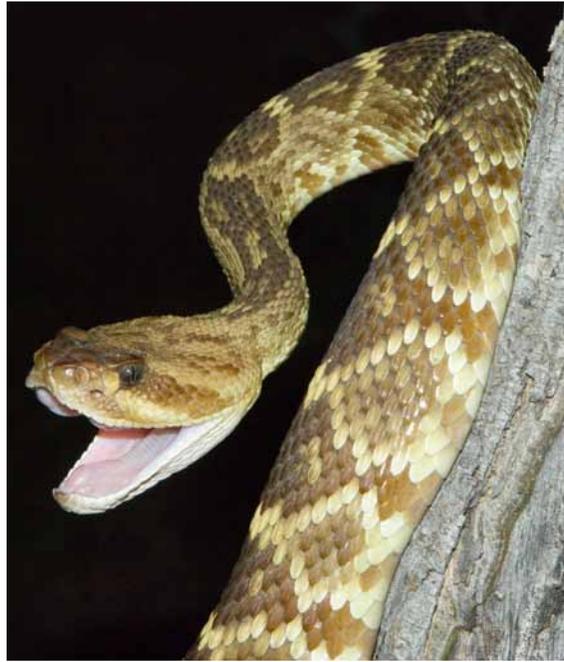


Figure 8. *Crotalus molossus* at Rancho Babisal. Although threatening, this individual was readjusting its jaws after its head had been pinned with a snake stick. Photo by J. Rorabaugh.



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

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