

A Preliminary Herpetofauna of the Sierra La Púrica, Sonora, Mexico

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Abstract—We documented four species of amphibians and 25 species of reptiles from the Sierra La Púrica, a sky island in northeastern Sonora, Mexico, that has been infrequently visited by herpetologists and other biologists. Most of our records come from expeditions we made in 2013 and 2025, but we also draw upon literature, museum records, the Madrean Discovery Expedition faunal database, and iNaturalist. Notable records include an elevational maximum (1,657 m) for the Mexican Spadefoot (*Spea multiplicata*) in Sonora, an elevational maximum (1,722 m) and 22 records of Ditmars' Horned Lizard (*Phrynosoma ditmarsii*), and the fourth Sonoran record for the Chihuahuan Hook-nosed Snake (*Gyalopion canum*). This is a preliminary herpetofauna because we did not visit the west side of the Sierra La Púrica where several southern species associated with the Río Sonora valley may occur. Some montane species likely eluded detection as well.

The Sierra La Púrica, located in the municipalities of Nacozari de García and Bacoachi in northeastern Sonora, Mexico, rises to about 2,467 m and, as we define it here, extends downslope on the west to about 1,109 m on the upper bajada of the Río Sonora Valley, and to about 1,250–1,360 m on the east side of the sierra (just west of Highway 17, Fig. 1). The Sierra La Púrica is part of a chain of sierras that runs from the Sierra Los Ajos east of Cananea south through the Sierra Buenos Aires and the Sierra La Púrica to the Sierra Cobriza west of Nacozari de García. Mountain passes between these ranges vary from about 1,550 to 1,600 m elevation, providing good corridors for movement of montane species among them. Much of the east side of the Sierra La Púrica drains into the north-flowing Arroyo las Calabazas, a tributary of the Río Bavispe–Río Yaqui, although the southeastern slopes drain into the south-flowing Arroyo Nacozari. Much of the west side drains into the Río Sonora, but drainages on the southwestern slope of the Sierra La Púrica drain into the Río Santa Rosa that confluences with Arroyo Nacozari at San Rafael de la Noria.

At Nacozari de García (1,103 m elev., ~21 km SSE of the high point in the Sierra La Púrica), mean annual precipitation is 578.5 mm, with 77% of that falling during July through September. April and May are the driest months (mean precipitation of 7.6 mm). The lowest mean monthly high and lowest mean monthly low temperatures (23.7 °C and 12.0 °C, respectively) are recorded in January, whereas the highest mean monthly high temperature (38.9 °C) is in June and the highest mean monthly low temperature (28.6 °C) is in July (weatherandclimate.com, accessed June 2026). Precipitation is likely greater and temperatures somewhat cooler in the Sierra La Púrica, particularly at high elevations.

Sanchez-Escalante et al. (2018) presented a preliminary flora of the Sierra La Púrica that included

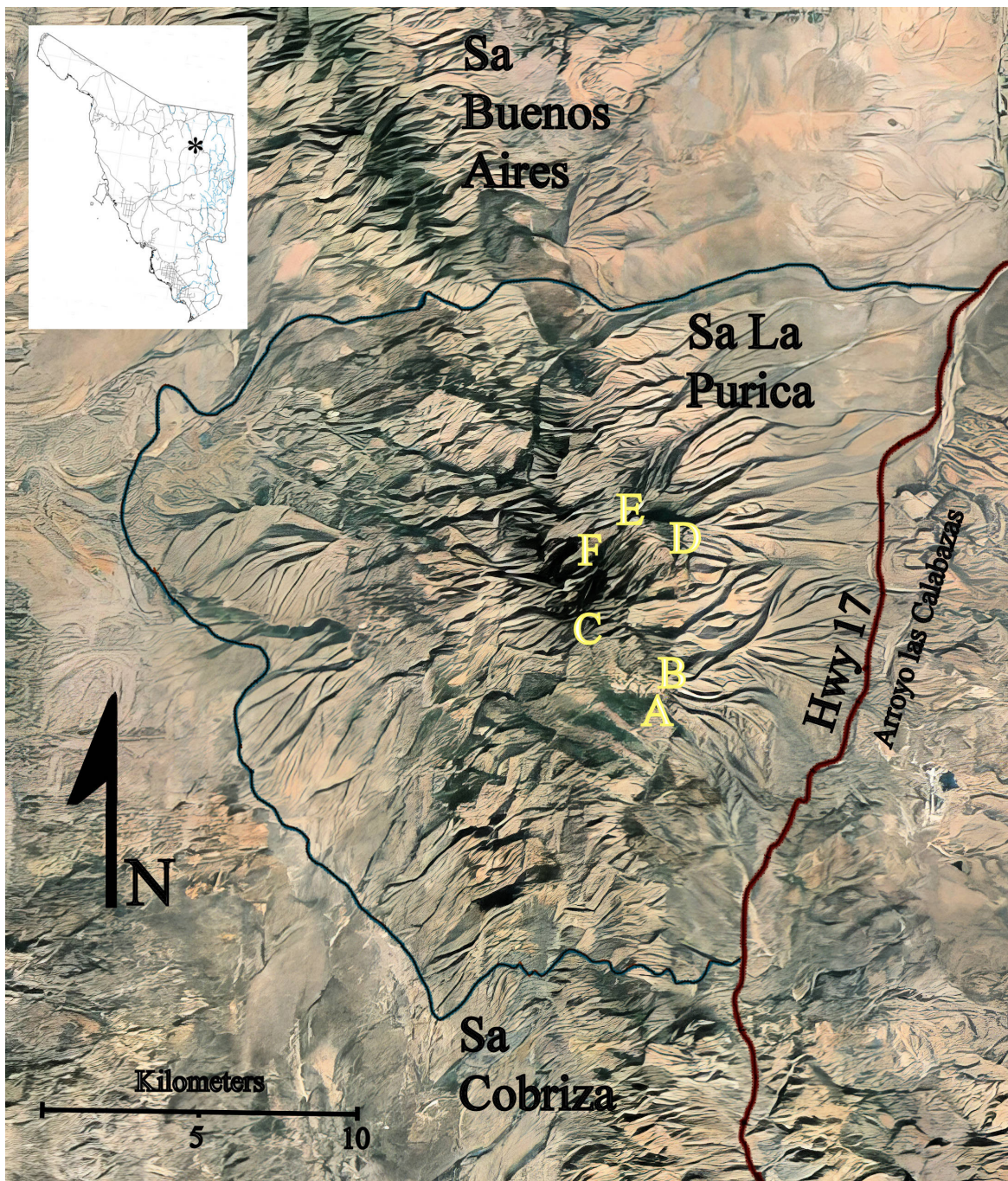
306 plant taxa in 71 families and 215 genera. The authors described four plant communities: desert grassland at the lowest elevations (Fig. 2), oak woodland on the slopes (Figs. 2 and 3), and pine-oak forest at the highest elevations. Linear riparian deciduous forest occurs along drainages passing through these larger vegetation communities (Fig. 4). At the very highest elevations, pine forest with few to no oaks is locally present (Fig. 5).

The Sierra La Púrica is part of the Área de Protección de Flora y Fauna Bavispe (APFF Bavispe), managed by the Comisión Nacional para el Uso y Conocimiento en México (CONANP). The APFF Bavispe extends over eight sierras in northeastern Sonora. The APFFs are areas established to conform to the regulations provided by the Ley General del Equilibrio Ecológico y la Protección al Ambiente (LGEEPA) and other applicable laws regarding places that contain habitats that flora and fauna depend on for their existence. The federal LGEEPA is a landmark piece of Mexican environmental protection legislation passed in March 1988 that defines the framework for all environmental law in Mexico, and provides some protection for APFFs, although most of the land with the APFF Bavispe is privately owned.

Methods

We define the northern and southern limits of our study area on roads through passes between Sierra La Púrica and the Sierra Buenos Aires on the north (Puerto Mababi, 30.6355 N, elev. 1,572 m) and between the Sierra La Púrica and the Sierra Cobriza on the south (30.4452 N, elev. 1,553 m). On the east, the boundary is just west of Highway 17 and on the west, we have drawn the boundary at the approximate juncture of the sierra and the bajada (Fig. 1). The Sierra La Púrica study area is approximately 426 km².

The Sierra La Púrica is part of a chain of sierras that runs from the Sierra Los Ajos east of Cananea south through the Sierra Buenos Aires and the Sierra La Púrica to the Sierra Cobriza west of Nacozari de García.



Our records for the Sierra La Púrica were collected during biological expeditions to the east side of the sierra: 10-17 July and 7-11 September 2013, and 1-5 November 2025. The July 2013 trip was a scouting trip for the larger September 2013 expedition.

Fig. 1. The Sierra La Púrica study area is outlined in the dark line and Highway 17 (our study area does not include the highway). Yellow letters show the locations of primary collection or observation localities: **A** – Rancho El Salto, **B** – Rancho Viejo, **C** – Las Antennas, **D** – Rancho Los Alisos, **E** – Rancho Jarazo, **F** – Barker's (1992) *Crotalus willardi silus* collection site (approximate). See Table 1 for additional information about these localities.

Our records for the Sierra La Púrica were collected during biological expeditions to the east side of the sierra: 10-17 July and 7-11 September 2013, and 1-5 November 2025. The July 2013 trip was a scouting trip for the larger September 2013 expedition. The latter trip, based at Rancho Viejo (part of Rancho El Salto, Fig. 1, Table 1), was a Madrean Archipelago Biodiversity Assessment (MABA) expedition hosted by Sky Island Alliance; it included 46 participants. The November 2025 trip, based at Rancho Los Alisos (Fig. 1, Table 1), was a Conservation Field Study hosted by

Greater Good Charities; it included 24 participants. Many participants in those expeditions were not herpetologists, but represented other biological disciplines. Participants who conducted herpetological inventories are authors on this paper. Trips included biologists from both the U.S. and Mexico. We did not visit the west side of the Sierra La Púrica.

We searched for amphibians and reptiles mostly with visual encounter surveys, although limited aquatic trapping for turtles (primarily in stock ponds) occurred with baited hoop nets and a few metal



Fig. 2. Desert grassland (foreground) and montane woodlands in the distance, September 2013. Photo by S. Minter.



Fig. 3. Oak woodland, Rancho Viejo, September 2013. Photo by J. Rorabaugh.



Fig. 4. Riparian deciduous forest. Arroyo below Rancho Viejo, September 2013. Photo by J. Rorabaugh.



Fig. 5. Pine forest near Las Antennas, September 2013. Photo by J. Rorabaugh.

funnel traps were employed terrestrially to capture lizards and snakes. Visual encounter surveys were conducted during the day and night; however, due to cool temperatures, very little nocturnal searching was conducted during the November 2025 expedition. A concerted effort was made to find Ditmars' Horned Lizards (*Phrynosoma ditmarsii*) during the November 2025 trip. Most surveys were within 2.5 km of base camps, but some longer excursions by vehicle were made to places such as Las Antennas at the high point of the sierra (Fig. 1). Our herpetological records (photo vouchers only) were collected mostly at or near primary localities listed in Table 1 and illustrated on Fig. 1.

We also consulted literature that might include observations or collections from the Sierra La Púrica. Additionally, we searched the Madrean Discovery Expeditions (MDE) faunal database, VertNet, the Arizona State University collections database, and iNaturalist for other records from the Sierra La Púrica. Records from iNaturalist were only accepted if they were accompanied by photographs that we could identify to species, or that referenced museum specimens collected from specific localities. We assumed that iNaturalist localities are correct.

Results

Amphibians and reptiles documented from our Sierra La Púrica study area include four species of

amphibians and 25 species of reptiles (Table 2). Collection and observational records are from the MDE database, our field notes, VertNet, iNaturalist, Armstrong and Murphy (1979), Barker (1992), including museum specimens of the Ridge-nosed Rattlesnake [*Crotalus willardi silus*] cited in that paper), Turner et al. (2017), and Van Devender et al. (2026). Most of the species were documented during our 2013 or 2025 expeditions (Table 2). Photos of vegetation communities and survey sites are presented in Figures 2-8. Some of the amphibians and reptiles we found are illustrated in Figures 9-17.

The first amphibian or reptile to be documented from our study area was a Gophersnake (*Pituophis catenifer*, MVZ:Herp 21030; see footnote #2 in Table 2 for museum acronyms) collected by Seth B. Benson, 2 June 1936 from "7 mi N Santa Rosa, ca. 35 mi N Cumpas". Ernest C. Tanzer collected a Desert Night Snake (*Hypsiglena torquata* = *Hypsiglena chlorophaea*, TCWC 33735) 20 September 1969 from the Sierra La Púrica, "64 mi S Agua Prieta". In June 1974, Michael D. Robinson and Darrel R. Frost collected Sonoran Spotted Whiptail (*Aspidoscelis sonora*), Elegant Earless Lizard (*Holbrookia elegans*), Clark's Spiny Lizard (*Sceloporus clarkii*), and Ornate Tree Lizard (*Urosaurus ornatus*) from the "SE end of Sierra La Purica NW Nacozari, ca 4500 ft el." for the UAZ.

To our knowledge, Barry L. Armstrong and James B. Murphy were the first herpetologists to access

Records from iNaturalist were only accepted if they were accompanied by photographs that we could identify to species, or that referenced museum specimens collected from specific localities. We assumed that iNaturalist localities are correct.

Table 1. Primary localities at which we and others collected or observed amphibians and reptiles in the Sierra La Púrica. See also Fig. 1.

Locality	Coordinates (WGS84) and elevation (m)	Vegetation Community	Observers, month, year
Rancho El Salto	30.52309, -109.72487 ; 1,504	Oak woodland	MABA, MDE, Jul & Sep 2013, Nov 2025
Rancho Viejo	30.53084, -109.72242; 1,657	Oak woodland	MABA, Jul & Sep 2013
Las Antennas	30.54406, -109.74861; 2,467	Pine-oak forest	MABA, Jul & Sep 2013
Rancho Los Alisos	30.56531, -109.71461; 1,504	Oak woodland	MDE, Nov 2025
Rancho El Jarazo	30.57556, -109.73250; 1,609	Oak woodland	MDE, Nov 2025
Barker's <i>C. w. silus</i> collection site	30.56620, -109.74927; 2,026 (approximate)	Pine-oak forest	D.G. Barker, 1984

the high country of the Sierra La Púrica, where they collected and observed *C. w. silus* in 1970–1974, 1978, and 1986. Specimens were deposited at UTA and KU. Armstrong and Murphy (1979) describe their trips during the 1970s. About 40 specimens of *C. w. silus* were observed during 1970–1974, including 11 in a two hour period in early July from 1,630 to 2,300 m elev. Canyons where snakes were found were in pine-oak forest with Sycamores (*Platanus wrightii*) and flowing water in the canyon bottoms. *Crotalus willardi silus* was observed from April through October, but most were found in the July–August rainy season. A pair was observed copulating on 15 July. A gravid female gave birth to five young on 7 August 1970, and another gave birth to four young on 10 August 1978. The authors noted the snakes from areas of predominantly pine forests were lighter in color, resembling the pine needle litter on the forest floor, whereas snakes from predominantly oak woodlands were a darker brown, matching the color of the oak leaf litter. Interestingly, Armstrong and Murphy observed no other species of *Crotalus* in the Sierra La Púrica. Their book (1979) includes a photograph of *C. w. silus* habitat in the Sierra La Púrica as well as other interesting natural history notes, although no observations or collections of other amphibian or reptile species are noted. In 1984, David G. Barker collected 12 *C. w. silus* from a canyon on the eastern slope of the sierra (Barker 1992, Fig. 1 and 17). Those specimens were deposited in various museums (Table 2).

We find no further herpetological museum collections or documented observations until our July and September 2013 MABA trips to Ranchos El Salto and Viejo, and Las Antennas, during which four species of amphibians and 16 species of reptiles were documented. During our November 2025 expedition, we documented two species of amphibians and 15 species of reptiles, including seven species of reptiles not documented during the 2013 expeditions (Table 2).

Records in iNaturalist, aside from those attributable to our expeditions, added a patch-nosed snake (*Salvadora* sp., iNaturalist #292362613) to our list, although the image provided was not adequate to determine if it was a Big Bend Patch-nosed Snake (*S. deserticola*) or Eastern Patch-nosed Snake (*S. grahamiae*). A 2025 photograph of a juvenile *Aspidoscelis sonorae* in iNaturalist (#328108285) was misidentified as a Desert Grassland Whiptail (*A. uniparens*). Other iNaturalist records for the Sierra La Púrica include a Sonoran Whipsnake (*Masticophis bilineatus*, iNaturalist #335727767), Black-tailed Rattlesnake (*Crotalus molossus*, iNaturalist #296860301), and 1984 records of *C. w. silus* provided by D. G. Barker (iNaturalist #335641325). Those latter records include an approximate location of where he made his observations and collections (Fig. 1, Table 1). A Ring-necked Snake (*Diadophis punctatus*) observed on 2 November 2025 by Sky Jacobs in iNaturalist is the same snake observed by Ryan Martinez on the same date and reported in the MDE database (Fig. 15, Table 2).

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Fig. 6. Sierra La Púrica from the eastern bajada (west of Hwy 17), November 2025. Photo by J. Rorabaugh.



Fig. 7. Dead and dying oaks on a south-facing slope near our Rancho Los Alisos camp, November 2025. Photo by J. Rorabaugh.

Table 2. Amphibians and Reptiles documented from the Sierra La Purica.

Scientific Name	Common Name	Elevation Range (m)	Vegetation Community ¹	Source ²
AMPHIBIANS - Anura				
<i>Anaxyrus punctatus</i> ²	Red-spotted Toad	1,500-1,657	oak woodland	MDE
<i>Hyla arenicolor</i> ³	Canyon Treefrog	1,486-2,467	oak woodland, pine-oak forest, pine forest, riparian deciduous forest	MDE
<i>Incilius alvarius</i> ³	Sonoran Desert Toad	1,392-1,657	oak woodland	MDE
<i>Spea multiplicata</i> ³	Mexican Spadefoot	1,657	oak woodland	MDE
REPTILES - Testudinis				
<i>Kinosternon sonoriense</i> ³	Sonora Mud Turtle	1,424-1,507	desert grassland-oak woodland ecotone, oak woodland, riparian deciduous forest	MDE, field notes
REPTILES – Squamata - Lacertilia				
<i>Aspidoscelis sonorae</i>	Sonoran Spotted Whiptail	1,316-1,885	desert grassland-oak woodland ecotone, oak woodland, riparian deciduous forest	MDE, UAZ, field notes
<i>Elgaria kingii</i> ³	Madrean Alligator Lizard	1,486	riparian deciduous forest	MDE
<i>Holbrookia elegans</i>	Elegant Earless Lizard	1,316-1,679	desert grassland, desert grassland-oak woodland ecotone, oak woodland	MDE, UAZ
<i>Phrynosoma ditmarsii</i> ³	Ditmars' Horned Lizard	1,502-1,770	desert grassland-oak woodland ecotone	MDE, field notes, Turner et al. (2017)
<i>Phrynosoma hernandesi</i> ³	Greater Short-horned Lizard	1,505-2,467	oak woodland, pine-oak forest, pine forest	MDE
<i>Plestiodon callicephalus</i> ³	Mountain Skink	1,486-1,637	oak woodland	MDE
<i>Sceloporus clarkii</i>	Clark's Spiny Lizard	1,372-1,642	desert grassland-oak woodland ecotone, oak woodland, riparian deciduous forest	MDE, UAZ
<i>Sceloporus jarrovi</i> ³	Yarrow's Spiny Lizard	1,659-2,467	oak woodland, pine-oak forest, pine forest	MDE
<i>Sceloporus virgatus</i> ³	Striped Plateau Lizard	1,448-2,467	desert grassland-oak woodland ecotone, oak woodland, pine-oak forest	MDE
<i>Urosaurus ornatus</i>	Ornate Tree Lizard	1,316-1,595	desert grassland, desert grassland-oak woodland ecotone, oak woodland, riparian deciduous forest	UAZ, MDE, field notes
REPTILES – Squamata - Serpentes				
<i>Crotalus molossus</i>	Black-tailed Rattlesnake	1,630	oak woodland	MDE, iNaturalist
<i>Crotalus willardi silus</i>	Ridge-nosed Rattlesnake	1,630-2,300	pine-oak forest, oak woodland, riparian deciduous forest	MDE, iNaturalist, KU, SDNHM, UF, UTA, Armstrong and Murphy (1979), Barker (1992)
<i>Diadophis punctatus</i> ³	Ring-necked Snake	1,597	oak woodland	MDE
<i>Gyalopion canum</i> ²	Chihuahuan Hook-nosed Snake	1,448	desert grassland-oak woodland ecotone	MDE, Van Devender et al. (2026)

Table 2 (continued). Amphibians and Reptiles documented from the Sierra La Purica.

Scientific Name	Common Name	Elevation Range (m)	Vegetation Community ¹	Source ²
<i>Hypsigena chlorophaea</i>	Desert Nightsnake	1,302-1,397	desert grassland	MDE, TCWC
<i>Lampropeltis pyromelana</i> ³	Sonoran Mountain Kingsnake	1,499-2,467	oak woodland, pine-oak forest	MDE
<i>Masticophis bilineatus</i>	Sonoran Whipsnake	1,543	desert grassland-oak woodland ecotone	MDE, iNaturalist
<i>Micruroides euryxanthus</i> ³	Sonoran Coralsnake	1,657	oak woodland	MDE
<i>Pituophis catenifer</i>	Gophersnake	1,469	desert grassland-oak woodland ecotone	MDE, MVZ ⁴
<i>Salvadora deserticola</i> or <i>grahamiae</i> ⁵	Patch-nosed Snake	1,420	desert grassland-oak woodland ecotone	iNaturalist
<i>Senticolis triaspis</i> ²	Green Ratsnake	1,586	riparian deciduous forest	MDE
<i>Tantilla yaquia</i> ³	Yaqui Black-headed Snake	1,486	desert grassland-oak woodland ecotone	MDE
<i>Thamnophis cyrtopsis</i> ²	Black-necked Gartersnake	1,486-1,615	oak woodland, riparian deciduous forest	MDE
<i>Trimorphodon lambda</i> ²	Sonoran Lyresnake	1,550	desert grassland-oak woodland ecotone	iNaturalist

¹Vegetation community derived from **1)** the record, **2)** field notes, or **3)** Google Earth imagery.
²Museum abbreviations are as follows: UAZ = University of Arizona; KU = University of Kansas; SDNHM = San Diego Natural History Museum; UF = University of Florida; UTA = University of Texas, Austin; TCWC = Biodiversity Research and Teaching Collections (Texas Cooperative Wildlife Collection); MVZ = Museum of Vertebrate Biology, University of California, Berkeley.
³First observation or collection of this species from the Sierra La Púrica made during our MABA or Conservation Field Study expeditions.
⁴Locality is too imprecise to define an elevation or vegetation community.
⁵The photo in iNaturalist is not adequate to determine the species.

Notable Records

Our expeditions documented four amphibian species and 15 species of reptiles from the Sierra La Púrica for the first time (Table 2). Our record of a Mexican Spadefoot (*Spea multiplicata*, Fig. 10) from oak woodland at Rancho Viejo represents an elevational maximum (1,657 m) for this species in Sonora. This anuran is more commonly found at lower elevations in grassland or desertscrub valleys in Sonora (Rorabaugh and Lemos-Espinal 2016).

The first *Phrynosoma ditmarsii* from the Sierra La Púrica (Fig. 11) was collected during our September 2013 expedition at Rancho El Salto. That animal was a young-of-the-year lizard (32 mm SVL) found at 1,679 m in an oak woodland-desert grassland ecotone on 10 September 2013 (Turner et al. 2017). We returned to that locality on 3 November 2025 and found nine additional *P. ditmarsii*. Twelve more *P. ditmarsii* were also found at three localities (1,502, 1,527, and 1,770 m elev.) near our Rancho Los Alisos base camp in November 2025, with the latter being the highest elevation *P. ditmarsii* ever recorded (Turner et al. 2017). The vegetation community at those three sites was oak woodland/

desert grassland ecotone (Fig. 8). Greater Short-horned Lizards (*Phrynosoma hernandesi*) were generally found at higher elevations, but their elevational distribution overlapped with that of *P. ditmarsii* at 1,505 to 1,770 m. Discovery of a Chihuahuan Hook-nosed Snake (*Gyalopion canum*, Fig. 13) at 1,448 m near Rancho Jarazo represents only the fourth record for Sonora (Van Devender et al. 2026). In Sonora, this species was previously documented in high grassland valleys but also in sky islands and the Sierra Madre Occidental to 1,845 m in pine-oak forest (Rorabaugh and Lemos-Espinal 2016).



Fig. 8. Some of the authors at a *Phrynosoma ditmarsii* collection site near our Rancho Los Alisos camp, November 2025. Photo by J. Rorabaugh.

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Fig. 9. *Hyla arenicolor*, Rancho Los Alisos, November 2025. Photo by Lana Ramsey.

Species Expected but not yet Documented

We suspect many species occur but are not yet documented from the Sierra La Púrica. We can look to collections and observations in the other sierras in this chain, as well as records from Highway 17 immediately to the east of our study area, to compile a list of likely species.

The Sierra Los Ajos, east and southeast of Cananea and the northernmost sierra in the chain that includes the La Púrica, has yielded Tarahumara Barking Frog (*Craugastor tarahumaraensis*, ASUHEP000456), Tarahumara Salamander (*Ambystoma rosaceum*), Chiricahua Leopard Frog (*Rana fisheri*), Chihuahuan Black-headed Snake (*Tantilla wilcoxi*), and Twin-spotted Rattlesnake (*Crotalus pricei*) (Rorabaugh and Lemos-Espinal 2016), all of which could occur in the Sierra La Púrica. However, no ranid frogs have been reported from the La Púrica, despite there being apparently suitable habitat in the areas we surveyed. We searched for *A. rosaceum* in suitable habitat but failed to find it. *Crotalus pricei* and *T. wilcoxi*, if present in the Sierra La Púrica, likely occur at high elevations based on their distribution elsewhere. Both *C. tarahumaraensis* and the Barking Frog (*C. augusti*) could occur in the La Púrica, but they are unlikely to be detected unless areas are surveyed early in the summer monsoon season when these anurans are active and calling. Our July 2013 scouting trip was in the early monsoon period, but no *Craugastor* were detected. An MDE scouting trip in July 2016 and an expedition in August of that year to the high country of the Sierra Buenos Aires did not document any amphibian or reptiles species not reported here for the Sierra La Púrica.



Fig. 10. *Spea multiplicata*, Rancho Viejo, September 2013. Photo by J. Rorabaugh.



Fig. 11. Juvenile *Phrynosoma ditmarsii* from near Rancho El Salto, September 2013. Photo by J. Rorabaugh.



Fig. 12. *Sceloporus virgatus* (juvenile), Rancho Los Alisos, November 2025. Photo by G. Molina-Padilla.

Other species not documented by us but found broadly across northeastern Sonora are likely to occur in the La Púrica, such as Sonoran Desert Tortoise (*Gopherus morafkai*), Canyon Spotted Whiptail (*Aspidoscelis burti*), Great Plains Skink (*Plestiodon obsoletus*), Regal Horned Lizard (*Phrynosoma solare*, LACM 5054 collected at “4 mi N Nacozari”, likely

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Fig. 13. *Gyalopion canum* (DOR), near Rancho Jarazo, November 2025. Photo by J. Rorabaugh.



Fig. 14. *Senticolis triaspis* in an arroyo near our Rancho Los Alisos camp, November 2025. Photo by J. Rorabaugh.



Fig. 15. *Diadophis punctatus*, Rancho Los Alisos, November 2025. Photo by C. Hedgcock.



Fig. 16. *Micruroides euryxanthus*, Rancho Viejo, September 2013. Photo by J. Rorabaugh.

on Highway 17), Common Kingsnake (*Lampropeltis getula*), Coachwhip (*Masticophis piceus*, UMMZ 78457 collected at “8.5 km al O de Pilares”; and two MDE observations from Highway 17 just east of our study area), Long-nosed Snake (*Rhinocheilus lecontei*), Western Diamond-backed Rattlesnake (*Crotalus atrox*), and Tiger Rattlesnake (*C. tigris*). These species are likely to occur in the lower to middle elevations of our study area (see distribution maps in Rorabaugh and Lemos-Espinal 2016).

We consider this a preliminary herpetofauna mostly because we did not visit the west side of the sierra. The Río Sonora Valley (west of the Sierra La Púrica) supports a number of species whose distributions are primarily to the south of the Sierra La Púrica, but that extend northward in mid- to lower elevations, often following fingers of foothills thornscrub or desert grassland-foothills thornscrub ecotones. Rancho Las Playitas, on the west side of the Río Sonora, is at a similar latitude (30.589° N) and elevation (1,060-1,590 m) as our study area, and a regional herpetofauna was recently published for that ranch (Turner et al. 2022). Species found at Rancho Las Playitas that could occur in the Sierra La Púrica, and not already mentioned above, include Mazatlan Narrow-mouthed Toad (*Gastrophryne mazatlanensis*), Lowland Leopard Frog (*Rana yavapaiensis*), Black Banded Gecko (*Coleonyx fasciatus*), Gila Monster (*Heloderma suspectum*), Great Plains Skink (*Plestiodon obsoletus*), Western White-bellied Spiny Lizard (*Sceloporus albiventris*), Mexican West Coast Boa (*Boa*

sigma, also see Van Devender et al. 2020), Thornscrub Hook-nosed Snake (*Gyalopion quadrangulare*), Neotropical Whipsnake (*Masticophis mentovarius*), Neotropical Vinesnake (*Oxybelis microphthalmus*, also see Van Devender et al. 2024), Western Threadsnake (*Rena humilis*), and File-tailed Groundsnake (*Sonora aemula*).

Land Use and Conservation

As mentioned above, parts of the Sierra La Púrica are within the APFF Bavispe, and as such the sierra is afforded some protection from anthropogenic impacts. The primary use of lands within our study area is cattle grazing. There are numerous cattle tanks constructed to collect runoff and provide water for cattle. Some of these tanks provide breeding habitat for anurans and Sonora Mud Turtles (*Kinosternon sonoriense*). We also observed roads, corrals, fences, and other livestock developments, but those projects have small footprints. In general, livestock grazing appears to be well-managed with relatively minimal impacts to vegetation communities. We observed no evidence of mining, and no mining disturbance can be seen on 2024 Google Earth imagery, though processing facilities for the Nacozari copper mine, including a smelter at La Fundación, are in the valley just east of Sierra La Púrica, so aerial deposition of toxic material is possible. Cut tree stumps are likely evidence of past timber and or fuelwood harvest. Darrel R. Frost reported that in 1974 he and Michael Robinson followed a relatively

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new logging road into the Sierra La Púrica (pers. comm. with JCR, June 2026), but currently the montane forests are not significantly affected by those activities. We observed no areas that have burned catastrophically in recent times.

In the American Southwest, the climate is getting warmer and, at least during the winter rainy season, drier (Garfin et al. 2013). Monsoon rainfall is difficult to model accurately, but some studies predict an increase in monsoonal precipitation as a result of climate change (Demaria et al. 2019; Douville et al. 2021; Battacharya et al. 2022), whereas other models predict decreases in precipitation (Pascale et al. 2017). Results of predictive climate models for Cananea posted by M. C. Fitzpatrick's lab (University of Maryland, Frostburg, <https://fitzlab.shinyapps.io/cityapp/>) suggest that by 2080 in winter, temperatures will increase by 4.3 °C and it will be 5.8% drier. Summers are predicted to be 5.1 °C warmer and 13.8% drier. Climate change may already be affecting vegetation communities in the Sierra La Púrica. In places, particularly on south-facing slopes, we observed many dead oaks (Fig. 7), likely killed by recent drought. Dead trees and other vegetation can increase the chances of damaging wildfires.

Taxonomic Notes

Regarding common and scientific names, we follow the latest compilation of Sonora's herpetofauna (Lemos-Espinal et al. 2019), with exceptions as noted in the "Taxonomic Notes" of Turner et al. (2025) and the following: we use *Rana fisheri* for the Chiricahua Leopard Frog (Hekkala et al. 2011 and Nicholson 2025), *Masticophis piceus* for the Coachwhip (Myers et al. 2017, 2019; Nicholson 2025), and *Oxybelis microphthalmus* for the Neotropical Vinesnake (Jadin et al. 2020, Nicholson 2025). We also use Ditmars' Horned Lizard as the common name for *Phrynosoma ditmarsii* (Sherbrooke 2020).

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Fig. 17. *Crotalus willardi silus*. Sierra La Púrica, 1984. Photo by D.G. Barker.

invertebrates. We thank Darrel Frost for sharing his recollections of the trip he and Michael Robinson made into the southeastern portion of the Sierra La Púrica in June 1974. Thanks to Raymundo Barrera of Rancho El Salto and Araceli Acosta (owner) and Manuel Tomás López Irigoyen (administrator) of Rancho Los Alisos for granting access to their lands.

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