Amphibians and Reptiles of the Roosevelt Reservoir Area, Arizona

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A COLLECTION representing seven species of amphibians and thirty-three species of reptiles (sixteen of lizards and seventeen of snakes) was made in the Roosevelt Reservoir area in Gila County, central Arizona, during the years 1936 and 1937 by the author as a spare-time study.

One species, *Leptotyphlops myopica,* has not previously been reported from the state. The specimens of *Rana tarahumarae* probably constitute the second Arizona record of this species and extend the known range about 165 miles north from the first station in Santa Cruz County, on the Mexican border. A few additional distribution records within the state are included, and more than half of the species have not been reported previously from Gila County.

Less collecting of amphibians and reptiles has been done in Gila County than in most sections of Arizona. No military forts of importance were located here, and this area was not on routes of early exploring expeditions. Present-day herpetologists have been more interested in the rich collecting areas along the Mexican boundary. In summarizing records of Arizona amphibians, Slevin (1928) cited no records from Gila County. Van Denburgh (1922) in a similar compilation of Arizona reptiles mentioned fourteen species from Gila County, of which two are not represented also in the author's collection. They are: *Crotaphytus wislizenii,* from the Gila River, and *Thamnophis angustirostris,* from Tonto Creek at an elevation of 6,000 feet. Van Denburgh cited three species from Roosevelt Reservoir and vicinity: *Callisaurus v. ventralis, Heloderma suspectum,* and *Cnemidophorus melanostethus.* From Sierra Ancha, also the author's collecting base, Van Denburgh listed five species: *Crotaphytus collaris baileyi, Sceloporus consobrinus, Phrynosoma douglassii hernandesi, Coluber t. taeniatus,* and *Lampropeltis pyromelana.* The remaining four species of other localities in Gila County were: *Uta ornata symmetrica, Phrynosoma solare, Micrurus euryxanthus,* and *Crotalus atrox.* Gloyd (1937) listed specimens of four species from Gila County, collected by Earl Sanders. Only one of these, *Crotalus m. molossus,* from 3 miles north of Roosevelt Dam, was not cited by Van Denburgh.

Roosevelt Reservoir, an artificial lake formed by Roosevelt Dam, is located at the union of Salt River and Tonto Creek within the Tonto National Forest in Gila County about 30 miles, by air line, northwest of Globe. In a natural basin at an elevation of about 2,100 feet, Roosevelt Reservoir is surrounded on all sides by steep, rough mountainous topography. The highest elevation in this vicinity is about 7,800 feet on Sierra Ancha, less than 20 miles northeast.

Collections were made on the watershed north and east of Roosevelt Reservoir within a 20-mile radius of the dam. Base for collecting was Sierra

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Ancha Experimental Forest of the Southwestern Forest and Range Experiment station, with headquarters at an elevation of about 5,000 feet on the southwest side of Sierra Ancha about 15 miles northeast of Roosevelt Dam. The various tanks, pits, plots, dams, etc., constructed at typical places on the watershed for research in forest influences, such as measurement of run-off, erosion, and stream flow, served as excellent traps for amphibians and reptiles. Most of the specimens, including those of a few species which otherwise might not have been represented, were captured alive in these research installations. A few important specimens were found dead on roads, where they had been run over by automobiles. Firearms were not used.

Variation of more than a mile in vertical elevation results in the presence of three zones of vegetation and a rich representation of amphibians and reptiles for the size of the area. These zones are: (1) semidesert, or Lower Sonoran, from Roosevelt Reservoir to an elevation of about 3,500 feet; (2) chaparral-woodland, or Upper Sonoran, roughly from 3,500 to 6,000 feet; and (3) pine-fir forest, or Transition, above 6,000 feet. With higher elevation temperature decreases, precipitation increases, and numbers of cold-blooded land vertebrates become fewer.

The semidesert zone is characterized by scattered xerophytic shrubs and trees with weeds and grasses among them. Dominant woody plants include jojobas or "coffeeberries" (*Simmondsia californica*), paloverdes (*Cercidium* spp.), and cacti (*Opuntia* spp.). Lizards and snakes are especially abundant in this hot, semiarid zone. Among the characteristic species here are: *Coleonyx variegatus, Holbrookia texana, Heloderma suspectum, Cnemidophorus melanostethus, Salvadora grahamiae hexalepis,* and *Crotalus a. atrox.*

Chaparral vegetation of broad sclerophyll shrubs with some open areas occupied by perennial grasses is common in the chaparral-woodland zone. Dominant chaparral species are shrub live oak (*Quercus turbinella*), mountain-mahogany (*Cercocarpus breviflorus*), and Gregg hornbush (*Ceanothus greggii*). On the more moist sites are oak woodlands of broad sclerophyll trees, in which Emory oaks (*Quercus emoryi*) and Arizona white oaks (*Quercus arizonica*) are dominant. Characteristic species of reptiles of the chaparral-woodland zone include: *Uta ornata symmetrica, Cnemidophorus perplexus, Eumeces obsoletus, Coluber t. taeniatus, Pituophis sayi affinis, Crotalus m. molossus,* and *Crotalus viridis oreganus.*

The pine-fir forest has as its dominant species ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga taxifolia*). Among the few species of amphibians and reptiles of this zone are: *Hyla arenicolor, Sceloporus u. consobrinus,* and *Lampropeltis pyromelana.*

Several genera of lizards and snakes are represented by different species in the semidesert zone from those of the higher zones. Examples typical of the semidesert zone include: *Uta stansburiana stejnegeri, Sceloporus magister, Phrynosoma solare, Cnemidophorus melanostethus, Coluber flagellum frenatus, Lampropeltis getulus yumensis,* and *Crotalus a. atrox.* Corresponding species of the same genera in higher zones are: *Uta ornata symmetrica, Sceloporus clarkii, S. u. consobrinus, Phrynosoma douglassii hernandesi, Cnemidophorus perplexus, Coluber t. taeniatus, Lampropeltis pyromelana, Crotalus viridis oreganus,* and *C. m. molossus.*

Although no attempt was made to collect large series of specimens, several were taken of most species. Specimens of every species listed except *Gerrhonotus kingii* were collected personally by the author. Credit is due various members of the personnel of Sierra Ancha Experimental Forest for assistance in collecting additional specimens. A complete set of specimens was deposited in the United States National Museum, and duplicates were retained at Sierra Ancha Experimental Forest. For checking and correcting his preliminary field determinations, the author is indebted to Drs. Leonhard Stejneger, Doris M. Cochran, and Hobart M. Smith, of the United States National Museum.

The list of species with notes and zonal distribution follows. Nomenclature is that of Stejneger and Barbour's (1939) checklist.

Scaphiopus couchii Baird. — A mating pair was found in water in a run-off tank July 8, 1936, following the first summer rain. Tadpoles are common in temporary pools in the semidesert after these summer rains.

Bufo alvarius Girard.—Two giant toads were collected at Grapevine Spring on Roosevelt Reservoir, semidesert zone.

Bufo punctatus Baird and Girard.—Four were caught at night May 16, 1937, in a creek, semidesert zone, where they were located by their call, a shrill bleat.

Bufo woodhousii Girard.—Three were obtained at night May 16, 1937, in Tonto Creek, semidesert zone, where they were found by their coarse croak.

Hyla arenicolor Cope.—Common in the pine-fir and chaparral-woodland zones but uncommon in the semidesert. Calling individuals and clasping pairs were common in water at a dam in the pine-fir forest on May 19, 1936. After the mating season adults are found occasionally around buildings.

Rana pipiens Schreber.—In small streams. One was collected in the semidesert zone but not preserved, and another was seen in the pine-fir zone.

Rana tarahumarae Boulenger.—A series of 22 specimens was taken out of about 100 observed in pools of water shaded by alders and sycamores along Rose Creek, elevation about 5,400 feet, at the lower border of the pine-fir zone, on August 22, 1936. This record probably is the second Arizona locality of this species of Chihuahua, southern New Mexico, and Arizona. Campbell (1931) previously collected specimens at Peña Blanca Springs in Santa Cruz County, near the Mexican border. The author saw a few adults and tadpoles at a spring in Bear Valley a few miles west of Peña Blanca Springs on May 15, 1938.

Coleonyx variegatus (Baird).—Common in the semidesert zone and rare in the chaparral-woodland zone. Several were collected in pits in the ground and in buildings at experimental plots, where more were trapped and seen frequently. Rarely found hiding under rocks.

Crotaphytus collaris baileyi (Stejneger). Three were captured in the chaparral-woodland zone and two in the semidesert zone.

Callisaurus ventralis ventralis (Hallowell).—Three were taken in the semidesert zone.

Holbrookia texana (Troschel).—Common in semidesert and uncommon in chaparral-woodland zone. Associated with lizards of the preceding species, which they resemble superficially.

Uta ornata symmetrica (Baird).—Abundant on ground and on tree trunks, chaparral-woodland zone. Young hatch early in August from eggs laid in experimental pits in the ground.

Uta stansburiana stejnegeri Schmidt.—Several were collected in pits in the ground in the semidesert.

Sceloporus clarkii clarkii Baird and Girard.—Resembling lizards of the species *S. magister,* these lizards are found in the chaparral-woodland zone on trunks of oak trees and on the ground.

Sceloporus magister Hallowell.—These swift, large lizards are common in the semidesert zone.

Sceloporus undulatus consobrinus (Baird and Girard).—On ground and tree trunks, but much less numerous than individuals of *Uta ornata symmetrica.* Chaparral-woodland and pine-fir zones. One was collected in an aspen forest also.

Phrysonoma douglassii hernandesi (Girard).—Common in chaparral-woodland and pine-fir zones.

Phrynosoma solare Gray.—Four were collected in the semidesert.

Gerrhonotus kingii Gray.—Seven of these infrequently collected lizards were taken in the chaparral-woodland and pine-fir zones at elevations from 5,000 to 7,000 feet. The specimens extend the range north into central Arizona.

Heloderma suspectum Cope.—These large, poisonous lizards are rarely run over and killed by automobiles on roads and infrequently collected alive. One young specimen 6½ inches long was taken alive on a road after sundown May 25, 1936. Semidesert zone up to the lower border of the chaparral-woodland zone at an elevation of about 4,000 feet. Vorhies (Shantz, 1936: 97–99) has emphasized that no person has ever been bitten by a Gila monster unless he was handling it carelessly. These unique, slow-moving lizards are harmless in the desert and should be left alone and protected by law and public sentiment. As Vorhies states, if this species were exterminated, we would be the losers.

Cnemidophorus melanostethus Cope.—Common in semidesert and uncommon in chaparral-woodland.

Cnemidophorus perplexus Baird and Girard.—Common in chaparral-woodland and uncommon in semidesert.

Eumeces obsoletus (Baird and Girard).—Uncommon on the ground, usually around leaf litter, in chaparral-woodland zone. Both adults and the black, blue-tailed young were taken.

Leptotyphlops myopica (Garman).—This species of worm snake is not included in the list of Arizona reptiles and amphibians by Slevin (1934). Recent extension of the range to Arizona by Stejneger and Barbour (1939) is based upon the specimens from the Roosevelt Reservoir area here recorded. Three were collected, one in 1935, one July 26, 1936, and one August 2, 1936, in run-off tanks in chaparral vegetation at an elevation of about 5,500 feet. They may have been washed into the tanks in heavy rains.

Coluber flagellum frenatus (Stejneger).—One was found dead on a road in the semidesert.

Coluber semilineatus (Cope).—Three specimens were collected in the semidesert and chaparral-woodland zones.

Coluber taeniatus taeniatus (Hallowell).—Common in chaparral-woodland. Often climbing in shrubs.

Salvadora grahamiae hexalepis (Cope).—Common in semidesert and chaparral-woodland.

Pituophis sayi affinis (Hallowell).—Common in chaparral-woodland and semidesert. One more than 6 feet long was the largest snake collected here. Johnson (1936) has described a fight between a gopher snake, or bull snake, and a coyote on Sierra Ancha, in which the coyote killed and ate the snake.

Lampropeltis getulus yumensis Blanchard.—Four were collected in the semidesert.

Lampropeltis pyromelana (Cope).—Common in chaparral-woodland and pine-fir forest.

Rhinocheilus lecontei Baird and Girard.—The only specimen was found dead on a road in the semidesert.

Thamnophis eques (Reuss).—Near water, chaparral-woodland and pine-fir zones.

Thamnophis ordinoides vagrans (Baird and Girard).—Around water, semidesert, chaparral-woodland, and pine-fir zones.

Hypsiglena ochrorhynchus Cope.—Four were taken in semidesert and chaparral-woodland zones.

Tantilla atriceps (Günther).—Two were collected in the chaparral-woodland zone. One was in a run-off tank, while the other was found hibernating in gravel along a road bank December 24, 1936.

Micruroides euryxanthus (Kennicott).—One was caught in a run-off tank near the upper border of the semidesert zone. These poisonous snakes are very rarely found here.

Crotalus atrox atrox (Baird and Girard).—Very numerous in the semidesert, where they reach a maximum length of about 5 feet. Many are run over and killed by automobiles on roads about sunset. Both typical specimens and those also segregated under *Crotalus scutulatus* (Kennicott) were collected. Klauber (1930) cited specimens of the two forms from Gila County, including *C. atrox* from Roosevelt Reservoir.

Crotalus molossus molossus (Baird and Girard).—Common in chaparral-woodland and pine-fir zones. Sometimes found around buildings.

Crotalus viridis oreganus (Holbrook).—Common in chaparral-woodland. Very young rattlesnakes are light gray with dark brown blotches, but all adults observed here are black except for narrow patterns of pink scales.

A few additional species have been reported reliably by foresters and others in the Roosevelt Reservoir area but are not represented in the author's collection. Chuckwallas (*Sauromalus obesus*) have been seen by several persons among granite boulders along Salt River above Roosevelt Reservoir. The author saw one about 25 miles southwest of the dam. Horned rattlesnakes or sidewinders (*Crotalus cerastes*) have been reported from Tonto Basin, north of Roosevelt Dam.

Mud turtles (*Kinosternon* sp.) are not uncommon in Roosevelt Reservoir

and Sallymae Creek, but attempts to get specimens were not successful. One land turtle of an uncertain species was caught on Sierra Ancha in 1938 and two others were reported previously. Land turtles probably are very rare in this area. Tiger salamanders (*Ambystoma tigrinum*) occur only a short distance away and are to be looked for, and western spadefoots (*Scaphiopus hammondii*) are to be expected here also.

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Herpetological Notes

DELAYED HATCHING IN THE SNAPPING TURTLE.—On a small, rocky island of Ashby Lake, Ashby Township, Lennox and Addington County, Ontario, 22 newly hatched snapping turtles, *Chelydra serpentina,* were unearthed on May 12, 1940. They were buried about 6 inches deep in light sandy soil, were apparently of one clutch and were alive, though not active since the temperature was near freezing. In a previous note (Copeia, 1933: 221), I suggested that snapping turtles may be delayed in their hatching, sometimes taking nearly a year to break from the earth. In the present case the eggs must have been deposited the previous year, for Ashby Lake was still ice-covered on May 5, 1940. Snapping turtles, near the northern edge of their range, can apparently remain over the first winter in the soil of the nesting site. This observation parallels Newman's report of over wintering in the eggs for *Graptemys geographica* (Newman, H. H., 1906, Jour. Comp. Neurol. Psychol., 16: 141).—G. C. Toner, *Cataraqui, Ontario, Canada.*