

AMPHIBIANS AND REPTILES IN NEVADA¹

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Although many naturalists study both amphibians and reptiles, there is little reason to include these two groups of vertebrates in a faunal report on such a desert region as Nevada, other than the similarity in method of preserving specimens. The great contrast in the life histories of these two kinds of animals is emphasized in their dissimilar responses to environmental conditions in the Great Basin. While one characteristically inhabits only the wettest situations, the other occupies and is especially adapted for life in the driest situations.

The University of California Museum of Vertebrate Zoology has carried on zoological exploration in Nevada, under the stimulation of its founder, Miss Annie M. Alexander, since the early years of its existence. Since 1927, renewed effort in that area has brought large collections representing all the groups of terrestrial vertebrates. On each expedition the collectors have been on the lookout for specimens of amphibians and reptiles in addition to their main objectives which usually were concerned with mammals or birds. Altogether more than 4,000 specimens of these cold-blooded vertebrates have been assembled and they form the basis for this report.

Names of persons who have had a part in assembling this material, a list of most of the localities where specimens were obtained, as well as other information of faunal import for this area may be found in my recent report on *The Birds of Nevada* (Pac. Coast Avifauna no. 23, 1936, pp. 1-145). Fifty accessions contain 4,213 specimens.

As was suggested in the preceding paragraph, the present faunal report is the result of field work by many persons. I am grateful to all of these collectors and especially to E. Raymond Hall, Ward C. Russell, Henry S. Fitch, and Tom Rodgers who made special efforts to get needed specimens. In actual preparation of the report much help was received from Mr. Rodgers who made the maps and who, with Mr. Walter Paxton, catalogued and measured many specimens. I am

thankful to the persons in charge of collections from which records were obtained (see p. 198). Mr. Lawrence M. Klauber and Mr. Charles M. Bogert have been generous in giving me results of their field work in Nevada. Dr. Joseph Grinnell has contributed to this report by advice and in other ways. Assistance in preparation of this publication was rendered by personnel of Works Progress Administration O.P. No. 465-03-3-193.

ACCOUNTS OF SPECIES

The sequence of genera in this report is that of the Check List of North American Amphibians and Reptiles (3rd ed.) by Stejneger and Barbour (1933). As in that check list the species and subspecies are here arranged alphabetically. Departures from that authority are chiefly in matters of taxonomy where recently accumulated material seems to require different treatment.

Items in each account are arranged according to a plan which is intended to include essential information but at the same time to allow sufficient flexibility to discard less significant matter. For each kind the adopted scientific name with authority is given as a heading. Next below this is a vernacular name selected usually for specific application; sometimes no finer distinction than the genus is feasible. Citation is given to the original description and the type locality is indicated for each form. When a kind has been attributed to Nevada by some other name than the one adopted here, at least one reference is given to each such synonym, but no effort has been made to compile a complete synonymy.

Because the ranges as defined in most reference works are not completely satisfactory or easily available, a brief statement of general range is given for each form. Following this is a summary of the nature of the occurrence of each form in Nevada. Then locality records are given insofar as I have been able to verify them. These are arranged by counties listed in general north to south order in the following sequence: Washoe, Storey, Ormsby, Douglas, Lyon, Humboldt, Elko, Pershing, Churchill, Lander, Eureka, White Pine, Mineral, Esmeralda, Nye, Lincoln, Clark. For most of the localities locations of specimens are

¹ Contribution from the Museum of Vertebrate Zoology of the University of California.

given where known; for some, published references are given, and a few are accepted from manuscripts. Following the list of locality records comes material of systematic significance and a summary of the natural history of each form as known from Nevada. Most of my own observations on the natural history of these animals have been published already in the *American Midland Naturalist* (1938, vol. 19: 20–32), and they are not repeated here.

ABBREVIATIONS

In the paragraphs giving locality records, locations of the specimens are given where known and the following abbreviations are used to designate collections which contain them:

Acad. Nat. Sci. Phila.....	Academy of Natural Sciences of Philadelphia
Calif. Acad. Sci.....	California Academy of Sciences
Klauber coll.....	Collection of L. M. Klauber, San Diego, California
Mus. Vert. Zool.....	Museum of Vertebrate Zoology, University of California
San Diego Soc. Nat. Hist...	San Diego Society of Natural History
Stan. Univ.....	Stanford University
U. C. L. A.....	University of California at Los Angeles
U. S. N. M.....	United States National Museum
Univ. Kans.....	University of Kansas
Univ. Mich.....	Museum of Zoology, University of Michigan

AMPHIBIA

Order **Salientia**

Suborder **Linguata**

SCAPHIOPODIDAE

Scaphiopus hammondii Baird

Western Spadefoot Toad

Original description.—*Scaphiopus hammondii* Baird, Pac. R. R. Rept., 10, 1859, Abbot's report, pt. 4, no. 4, p. 12, pl. 28 (figs. 2a, 2b, 2c, 2d) (Fort Reading [near Redding, in Shasta County], California).

Synonyms for Nevada.—*Scaphiopus intermontanus* Cope, 1883, pp. 15, 18.

Speca hammondii intermontana Cope, 1889, p. 304.

Range.—The species occurs in western North America from British Columbia south to Mexico

and east to the western edge of the Mississippi Valley. Several geographic races have been distinguished but the whole group has not yet been satisfactorily studied.

Occurrence in Nevada.—Has been found at widely scattered localities throughout the state south to the vicinity of Bunkerville in the Virgin River Valley near the eastern border of the state and just south of the northern boundary of Clark County. Localities of capture are mainly at levels between 4,000 and 6,000 feet; extremes are about 1,700 feet at the southernmost locality and 7,500 feet in Greenmonster Cañon, Monitor Range. Most of the localities are on the floors of the larger valleys. Dates of capture of adults are mostly in the early summer months from the latter part of May through July. Extremes are in Clark County, March 28, 1923, and October 2, 1931. Farther north an early date is April 24, 1930, 5,500 feet, in Smoky Valley. Late records are on September 5 and 8, 1930, at 6,800 and 6,500 feet, in northern White Pine County.

Nevada localities (Fig. 1) (380 specimens in Museum of Vertebrate Zoology).—

Washoe County: 4½ miles southwest of Diessner, 5,800 feet (Mus. Vert. Zool.); The Willows, Pyramid Lake (U. S. N. M.); Pyramid Lake (Calif. Acad. Sci.; U. S. N. M.).

Ormsby County: Carson City (U. S. N. M.).

Humboldt County: Thousand Creek Hot Springs (Mus. Vert. Zool.); Virgin Valley (Mus. Vert. Zool.); Big Creek at base of Pine Forest Mountains (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.); 1 mile north to 10 miles southwest of Winnemucca (Mus. Vert. Zool.).

Elko County: Marys River, 22 miles north of Deeth (Mus. Vert. Zool.); Piñon Range (Univ. Mich. Mus.); Lower Annie Creek (Univ. Mich. Mus.); Humboldt River Valley (Univ. Mich. Mus.); James Cañon (Univ. Mich. Mus.); Carlin (Univ. Mich. Mus.); Maggie Cañon (Univ. Mich. Mus.); Lower Maggie Creek; (Univ. Mich. Mus.); 10 miles southwest of Midas (Mus. Vert. Zool.).

Pershing County: 2 miles east of Unionville (Mus. Vert. Zool.).

Lander County: Smith Creek (Mus. Vert. Zool.).
Eureka County: 5 miles north of Beowawe (Mus. Vert. Zool.); Winzell (Mus. Vert. Zool.).

White Pine County: Cherry Creek (Mus. Vert. Zool.); east side of Schellbourne Pass (Mus. Vert. Zool.); 2½ miles east of Baker (Mus. Vert. Zool.).

Mineral County: East Walker River, 2 miles

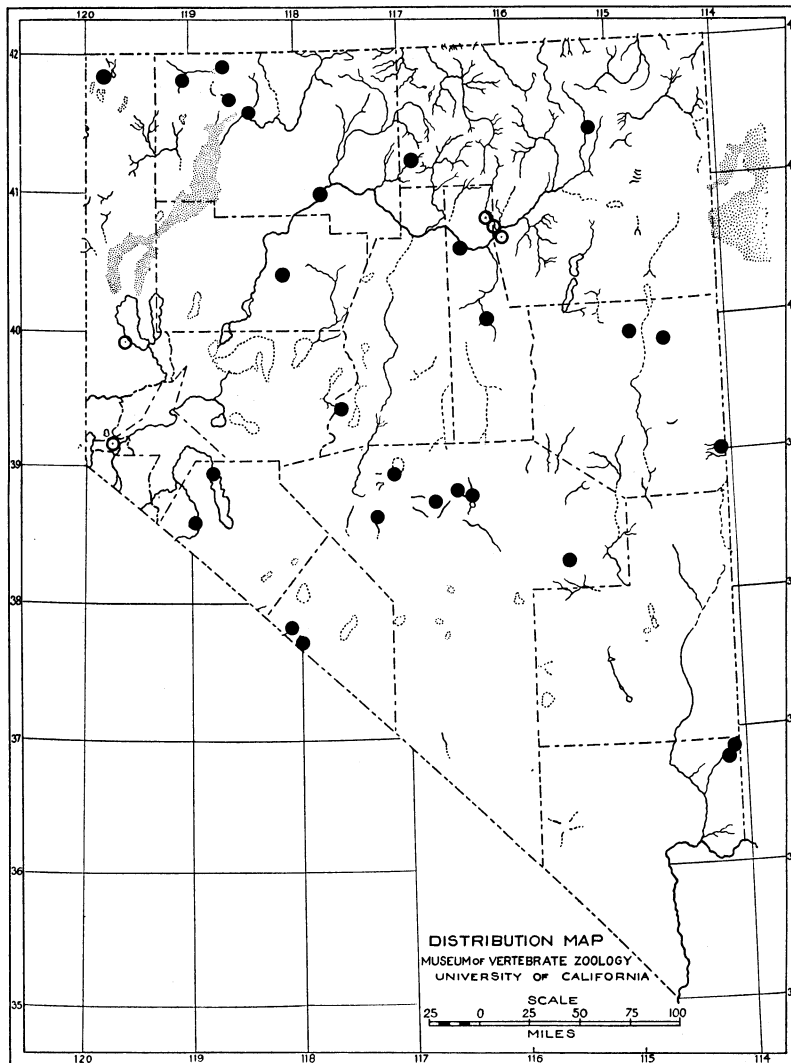


FIG. 1. Distribution of *Scaphiopus hammondi* in Nevada. Solid figures indicate specimens in Museum of Vertebrate Zoology; open figures indicate other records.

northwest of Morgans Ranch (Mus. Vert. Zool.); 3 miles south of Schurz, on Walker Lake (Mus. Vert. Zool.).

Esmeralda County: Arlemont (Mus. Vert. Zool.); Fish Lake (Mus. Vert. Zool.).

Nye County: Smoky Valley, 4 to 5 miles southeast of Millett P. O. (Mus. Vert. Zool.); 7 miles north of San Antonio (Mus. Vert. Zool.); Monitor Valley, 9 miles east of Toquima Peak (Mus. Vert. Zool.); Greenmonster Cañon, Monitor Range (Mus. Vert. Zool.); Fish Spring Valley, 6.5 miles north of Fish Lake (Mus. Vert. Zool.); Burned Corral Cañon, Quinn Cañon Mountains (Mus. Vert. Zool.).

Clark County: Bunkerville (Mus. Vert. Zool.); $\frac{1}{4}$ mile north of Mesquite (Mus. Vert. Zool.).

A specimen from Salt Lake City, Utah, and three or four from Pyramid Lake, Nevada, provided the basis for the description of the species *Scaphiopus intermontanus* by Cope (1883, p. 15). According to him the frontoparietal bones, though ossified, are not roughened in this form as in the other species of *Scaphiopus*. He considered this form nearest to the one from San Antonio, Texas (*S. varius*), from which it differed in having the vomerine teeth between the posterior borders of the internal nares rather than entirely posterior to them. Also the lips are not cross-barred, as they are in *S. varius*, and the superior region has two pale lines on each side, which are replaced by a coarse marbling in *S. varius*. Compared with *hammondi* this form was supposed to be distinguished by larger size, lighter colors, and the presence of the superior pair of light lines.

Nearly 400 specimens of this species in the Museum of Vertebrate Zoology were studied to determine the identity of the Nevada ones. These fall into general groups with characters about as Cope (1889, p. 303) indicated. However, the material is not yet sufficient to make adequate definitions of the groups. The easternmost group is represented by fourteen specimens from a single locality in eastern Colorado. They show remarkable uniformity in the characters which have been ascribed to the form *bombifrons*. The eighteen specimens from southern California are nearly as uniform in opposite development of these characters. They have the features that have been assigned to the form *hammondi*. However, the type locality, Fort Reading, in the northern part of the Sacramento Valley, is about 125 miles north of the nearest locality represented in that lot from southern California. No specimens are available from the northern Sacramento Valley to show

whether the population from the southern part of the state is truly *hammondi*.

The rest of the specimens are from scattered western localities between these two extremes, with few adults from any one place. They appear to demonstrate that *bombifrons* and *hammondi* are in the same species, for there is obvious intergradation in every character. Moreover, it seems likely that additional material from this intervening area would demonstrate the validity of a third race, *intermontanus*. In this area the toads are less uniform than either the Colorado or California populations and they are nearer structurally to the latter.

The variable characters in this species change perceptibly with increase in age, thus, to some extent, discounting their usefulness in geographical analysis. Table 1 (p. 200) summarizes some of the variable structural features of specimens in the Museum.

At Pyramid Lake, in 1911, 1912, and 1913, this toad was studied by Snyder (1920, p. 82). The species was seen first from April 23 to 25, and egg-laying was noted from May 28 to June 2. He pointed out that the chorus differed from that of *Hyla* and *Rana*, being in a lower key, somewhat guttural, and a little rasping; also it was entirely different from that of *Bufo*. The animals were collected in numbers in the quiet water of irrigation ditches and in little ponds, where at night they sprawled out motionless in the water, eyes projecting above the surface. All of them disappeared after egg-laying on June 2, 1911. Also at Pyramid Lake, in 1916, Van Denburgh and Slevin (1921, p. 29) from July 3 to 9, obtained fourteen specimens at dusk in pools of water on the beach.

Ruthven and Gaige (1915, p. 15) found this species to be common in the Humboldt Valley, about Carlin. The only adult obtained was found beneath a well curb in Carlin. Near Maggie Creek, on July 4, they collected many small, recently transformed individuals in the dried up bed of an irrigation ditch.

Specimens were obtained by Taylor (1912, p. 345) in Humboldt County, in 1909, on May 30 and June 4 and 21.

BUFONIDAE

Bufo boreas boreas Baird and Girard

Northwestern Toad

Original description.—*Bufo boreas* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, pp. 174–175 (Columbia River and Puget Sound).

TABLE 1
VARIATION IN SPADEFOOT TOADS FROM WESTERN UNITED STATES

Locality	No. of spec.	Internasal width			Pigment on 1st front toe			Interorbital boss			Metatarsal tubercle		
		nostril to eye			pres-absent trace ent			pres-absent trace ent			long	med.	high
Los Angeles, Tulare, Santa Barbara, Kern, Fresno Cos., Calif.....	18	14	1	3	11	7	0	13	5	0	18	0	0
Lassen, Modoc, Plumas, and Mono Cos., Calif.....	35	11	11	12	35	0	0	21	13	0	27	6	2
Oregon.....	2	0	0	2	1	0	1	0	2	0	1	0	1
Washington.....	2	0	0	2	1	0	1	0	0	2	1	1	0
Idaho.....	3	0	0	3	2	0	1	0	2	1	1	0	2
Humboldt Co., Nevada.....	8	4	0	4	7	1	0	2	4	1	3	3	2
Mineral, Esmeralda Cos., Nevada.....	15	2	4	7	8	4	3	6	6	1	9	5	1
Lander Co., Nevada.....	1	0	0	1	1	0	0	0	0	1	0	0	1
Nye Co. (adults).....	17	3	2	12	8	1	8	1	15	1	8	4	5
Nye Co. (young).....	263	160	79	24	257	5	1	112	149	0	183	53	6
White Pine Co., Nevada.....	3	0	0	3	2	0	1	0	0	3	1	1	1
Elko Co., Nevada.....	2	2	0	0	0	1	1	0	2	0	1	1	0
Clark Co., Nevada.....	2	0	0	2	1	0	1	0	1	1	2	0	0
Utah.....	1	0	1	0	1	0	0	0	1	0	1	0	0
Colorado.....	14	0	0	14	5	0	9	0	0	14	0	0	14
Arizona.....	5	0	0	5	0	2	3	0	2	3	1	1	3
New Mexico.....	1	0	0	1	1	0	0	0	0	1	1	0	0

Synonyms for Nevada.—*Bufo columbiensis*, Cope, 1889, p. 271.

Bufo boreas, Ruthven and Gaige, 1915, p. 13.

Bufo boreas halophilus, Slevin, 1928, p. 96.

Range.—This race extends from southern Alaska south to central California and eastward in the United States to Colorado.

Occurrence in Nevada.—Rather generally distributed in the northern half of the state south to about the 39th parallel; extends beyond this line at least in Smoky Valley. Limited closely to near vicinity of streams, but otherwise wide-ranging. Has been captured at altitudes from near 4,000 feet to over 9,000 feet.

Nevada localities (Fig. 2) (163 specimens in Museum of Vertebrate Zoology).—

Washoe County: Rock Creek, 7,000 feet, Granite Mountains (Mus. Vert. Zool.); 4 miles south of Flanigan, 4,100 feet (Mus. Vert. Zool.); Sutcliffe (Van Denburgh and Slevin, 1921, p. 29); The Pyramids (Van Denburgh and Slevin, 1921, p. 29); Anaho Island, Pyramid Lake (Calif. Acad. Sci.); Verdi (Mus. Vert. Zool.); Reno (Mus. Vert. Zool.); Galena Creek (Mus. Vert. Zool.); 3 miles south of Mount Rose, 8,500 feet (Mus. Vert. Zool.); Incline (Mus. Vert. Zool.).

Storey County: Virginia City (U. S. N. M.).

Ormsby County: Carson City (U. S. N. M.).

Douglas County: Glenbrook (Calif. Acad. Sci.; U. S. N. M.).

Humboldt County: Alder Creek (Mus. Vert. Zool.); Leonard Creek (Mus. Vert. Zool.); Big Creek Ranch (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.); Martin Creek R. S., Santa Rosa Mountains (Mus. Vert. Zool.).

Elko County: Mountain City (U. S. N. M.); Cobb Creek, 6 miles southwest of Mountain City (Mus. Vert. Zool.); Marys River, 22 miles north of Deeth (Mus. Vert. Zool.); 5 miles northwest of Deep Creek (Mus. Vert. Zool.); Elko (Calif. Acad. Sci.); Wells (U. S. N. M.); Upper Humboldt Valley (U. S. N. M.); Summit Secret Pass (Mus. Vert. Zool.); Jerry Creek (Mus. Vert. Zool.); head of Ackler Creek (Mus. Vert. Zool.); west side of Ruby Lake (Mus. Vert. Zool.); South Fork of Long Creek (Mus. Vert. Zool.); Three Lakes (Mus. Vert. Zool.); Harrison Pass R. S. (Mus. Vert. Zool.); 3 miles south of Halleck (U. S. N. M.); James Creek (Univ. Mich.); Maggie Creek (Univ. Mich.); Moleen Cañon (Univ. Mich.); 10 and 11 miles southwest of Midas (Mus. Vert. Zool.).

Lander County: Reese River Valley, 7 miles north of Austin (Mus. Vert. Zool.); Austin (U. S. N. M.); Big Creek (Mus. Vert. Zool.); Kingston R. S. (Mus. Vert. Zool.).

Eureka County: Evans (Mus. Vert. Zool.); 4 miles south of Romano, Diamond Valley (Mus. Vert. Zool.); Winzer (Mus. Vert. Zool.).

White Pine County: Willow Creek, 2 miles south of county line (Mus. Vert. Zool.).

Esmeralda County: Fish Lake (Mus. Vert. Zool.).

Nye County: 5 miles southeast of Millett P. O. (Mus. Vert. Zool.); South Twin River, 6,000 feet (Mus. Vert. Zool.); $1\frac{1}{2}$ miles south of Darrough's, 5,700 feet (Mus. Vert. Zool.); 7 miles north of San Antonio (Mus. Vert. Zool.).

Around the southern margin of the range of this species, in the dry areas in California and Nevada, are several populations or groups of populations that are segregated from one another by desert land which has no suitable habitat for this kind of toad. Some of these populations have been distinguished and named by naturalists, but the field work in this district has not been sufficient to clarify the taxonomic relations of all the colonies. No final treatment can be given the species now, but it seems clear that at least the races *halophilus* and *nelsoni* deserve recognition in southern California and Nevada.

The greatest uncertainty remains with respect to the toads in the vicinity of Walker Lake in western Nevada, which are here assigned to *B. b. halophilus*, but which seem to have no direct geographic connection with that race. Then, the sixteen specimens from Fish Lake Valley appear to represent an extreme of development of characters which can be detected in the southern Sierra Nevada. The most striking feature of coloration in this lot is the heavily spotted throat possessed by all those from Fish Lake Valley. This character is shown by only one of a large series of *B. b. boreas* from Humboldt County, Nevada. Apparently the Fish Lake Valley toads do not reach a large size; the largest one is only 80 mm. in head and body length.

Mention of occurrence of *B. woodhousii* in Humboldt County, Nevada, in various publications (Taylor, 1912, p. 344; Kellogg, 1932, p. 72) apparently is based on specimens of *Bufo boreas boreas* in the Museum of Vertebrate Zoology.

In the vicinity of the Pine Forest Mountains, Humboldt County, Taylor (1912, pp. 343-345) found toads at levels between 4,100 and 8,500 feet. In the mountains they were present in the meadows and small lakes. At lower altitudes

they were obtained along the streams; none being found more than fifteen feet from running water. One tried to escape by swimming to the bottom of a stream where it remained for several minutes. Usually, when pursued, they left the water and tried to escape over land. A mating pair was observed at 4,350 feet on June 9, and tadpoles were observed on May 24 and August 7.

Ruthven and Gaige (1915, p. 13) found this species to be abundant in the upper Humboldt Valley. Several females found on July 16, in dense grass at the edge of ditches, contained eggs. The toads were tame and usually walked rather than hopped. Stomachs contained ants and beetles. Tadpoles were abundant and in late July the trails in James Cañon were covered with recently transformed individuals. These authors report eight out of eleven adult toads having distinctly oval ear patches. Length of leg to heel was less than the distance to arm insertion by half an inch or equal to the distance to the rear end of the parotoids. The color was a dull brownish gray, with a broad light vertebral stripe, a patch of light color beneath the eye, a conspicuous black blotch between the thighs on the ventral surface, and with the tubercles on the fingers and toes tipped with orange.

***Bufo boreas halophilus* Baird and Girard** California Toad

Original description.—*Bufo halophila* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1853, p. 301 (Benicia, Solano County, California).

Range.—Lower parts of central and southern California, south to northern Lower California and eastward to Nevada.

Occurrence in Nevada.—Recorded from several localities in the vicinity of Walker Lake in west-central part of the state. Whether this population is connected with the main range of the race in California or is isolated from it cannot be determined from the material now available.

Nevada localities (Fig. 2) (50 specimens in Museum of Vertebrate Zoology).—

Mineral County: 3 miles south of Schurz (Mus. Vert. Zool.); Cottonwood Creek (Mus. Vert. Zool.).

In a series of 31 specimens from 3 miles south of Schurz on Walker Lake, Mineral County, 12 are unspotted below, 11 are faintly speckled with small dark spots, and 8 are thickly dotted with small dark spots. In each individual of this series the knees and elbows meet or overlap when

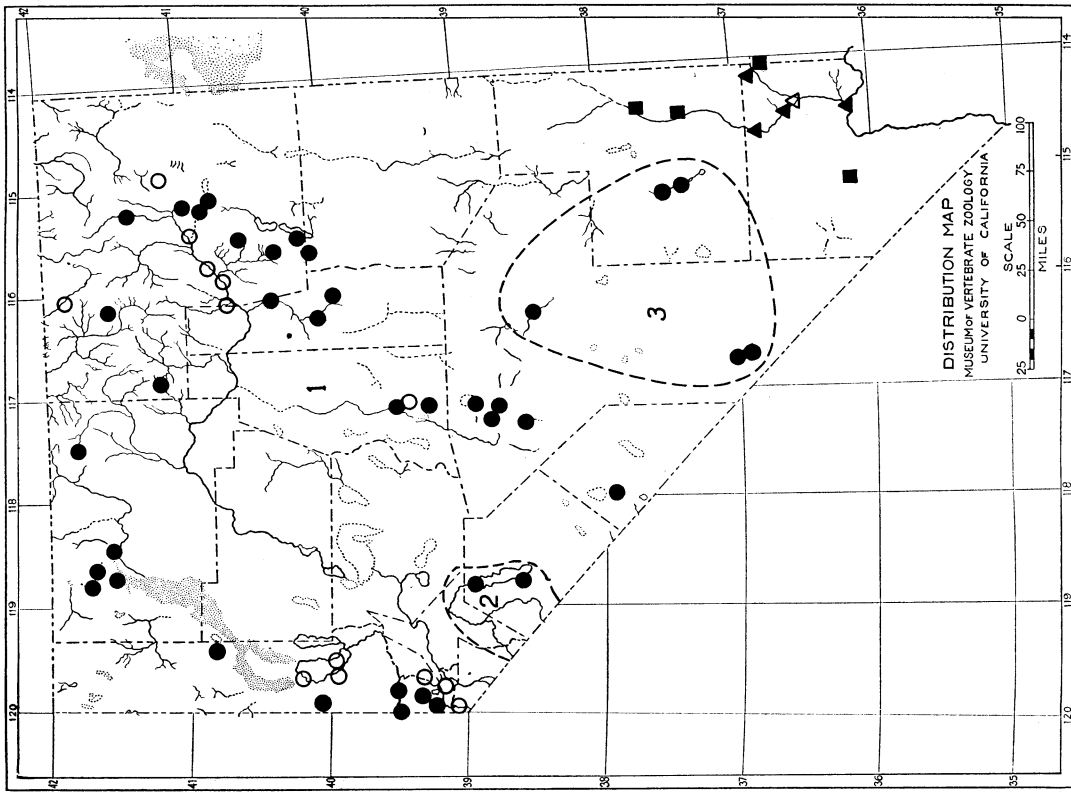


Fig. 2. Distribution of *Bufo boreas* (circles) in Nevada (1, *B. b. boreas*; 2, *B. b. halophilus*; 3, *B. b. nelsoni*), *Bufo compactilis* (squares) and *Bufo woodhousii* (triangles).

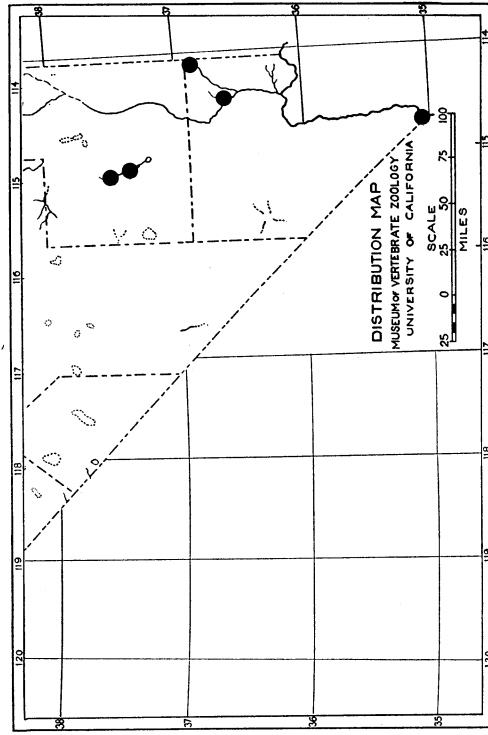


Fig. 3. Distribution of *Bufo cognatus* in southern Nevada.

adpressed to the side of the body. Compared with the toads from the Amargosa River these have distinctly wider and more blunt heads. The tubercles on the backs are rougher and more prominent in the Walker Lake specimens.

***Bufo boreas nelsoni* Stejneger**

Amargosa Toad

Original description.—*Bufo boreas nelsoni* Stejneger, N. Amer. Fauna no. 7, 1893, pp. 220–221, pl. 3, figs. 4a, 4b (Oasis Valley, Nye County, Nevada).

Synonym for Nevada.—*Bufo boreas halophilus*, Slevin, 1928, p. 96.

Range.—Southern and eastern Nye County and northern Lincoln County, Nevada.

Occurrence in Nevada.—So far known from three separated localities, but most characteristic population is in the upper part of the Amargosa River. Apparently this toad is more closely restricted to water than even its near relatives which inhabit more humid districts. Near Beatty, about May 20, 1931, many small young toads were picked up near the stream; large tadpoles were obtained here on May 4, 1936.

Nevada localities (Fig. 2) (60 specimens in Museum of Vertebrate Zoology).—

Nye County: Springdale, north end Oasis Valley (Mus. Vert. Zool.); Oasis Valley (U. S. N. M.); Amargosa River, 3½ miles northeast of Beatty (Mus. Vert. Zool.); Hot Creek Valley, 5,900 feet (Mus. Vert. Zool.).

Lincoln County: Pahrnagat Valley, 3 miles south of Crystal Spring (Mus. Vert. Zool.); 4 miles south of Alamo (Mus. Vert. Zool.).

The characters given by Stejneger (1893, p. 220) in the diagnosis of *Bufo boreas nelsoni* were as follows: "Similar to *B. boreas*: Skin between warts smooth; snout protracted, pointed in profile; webs of hind legs very large; soles rather smooth; limbs shorter, elbows and knees not meeting when adpressed to the sides of the body; inner metacarpal tubercle usually very large."

The 51 specimens now on hand from Oasis Valley and the Amargosa River near Beatty agree with this diagnosis in some features and differ from it in others. They contrast with the toads of the species *Bufo boreas* to the north and west in the following characters.

Small size: the largest adult in the lot measures 72.5 mm. in head and body length. This is a little more than half the maximum size of *Bufo b. boreas*.

The narrow, wedge-shaped head, especially when viewed from below, is one of the striking peculiarities of this toad. This seems to be correlated with the snout protracted and pointed in profile as mentioned by Stejneger.

Limbs so reduced that when adpressed to sides of body elbows and knees do not meet as was pointed out by Stejneger.

Small feet and reduced webbing is especially noticeable and is just the reverse of Stejneger's statement which may not have been as he intended.

Reduced spots below in all the large individuals contrasts with *boreas* and with all small ones from the Amargosa Valley. Possibly the old ones tend to lose ventral spotting.

Smooth skin and small, weakly developed, warts which characterize this lot may be an indication of close restriction of these toads to the water.

Inner metacarpal tubercle appears to average large, as Stejneger indicated.

Specimens from two other localities in southern Nevada, Hot Creek Valley and Pahrnagat Valley, seem to be nearer to this form than to any other, but the few available from there appear to vary towards *B. b. boreas*.

I conclude that *B. b. nelsoni* is a well-marked subspecies developed almost to the point of being a distinct species and that it is most closely related to the race *boreas* which comes near it on the north. This population is on the margin of the range of the species and shows extreme development of its characters. These characters are not modified in the direction of *halophilus* which also occurs to the south of *boreas*, but typically on the lower ground nearer the Pacific coast.

***Bufo cognatus* Say**

Great Plains Toad

Original description.—*Bufo cognatus* Say, in Long, Account of an expedition from Pittsburgh to the Rocky Mountains, vol. 2, 1823, p. 190 (Arkansas River, Prowers County, Colorado).

Synonym for Nevada.—*Bufo lentiginosus woodhousii*, Stejneger, 1893, p. 221.

Range.—Montana east to North Dakota and south to southeastern California and into Mexico.

Occurrence in Nevada.—The known localities of capture are in the southeastern part of the state, south of 38° N. and east of 116° W. Specimens in Mus. Vert. Zool. were taken in May.

Nevada localities (Fig. 3) (97 specimens in Museum of Vertebrate Zoology).—

Lincoln County: Crystal Spring, and 1 and 3 miles north, 4,000 feet, Pahrnagat Valley (Mus. Vert. Zool.); Pahrnagat Valley (U. S. N. M.); 4 miles south of Alamo (Mus. Vert. Zool.).

Clark County: Mesquite, west of Virgin River, 1,950 feet (Linsdale, MS); 2 miles southeast of Overton, 1,300 feet (Mus. Vert. Zool.); Colorado River, opposite Fort Mojave (Mus. Vert. Zool.).

Sixty-one specimens of *Bufo cognatus* were obtained, May 16 to 24, 1932, by a party of collectors from the Museum of Vertebrate Zoology, at the north end of Pahrnagat Valley, Lincoln County, in the vicinity of Crystal Spring. One of these collectors (Fitch, MS) made notes from which the following items were obtained: At Crystal Spring, on May 15, a large toad was captured just before dusk along the edge of the shallow lake two hundred yards north of the camp. At 8:30 p. m., after dark, search was begun with flashlights for amphibians in an alfalfa field between camp and the lake. None was found in the dry part of the field. Crickets were chirping in the field, but when the persons came near the edge of the water, they recognized that a part of the chorus was made by the toads. They searched for several rods along the shore and found two toads, but most of the animals were out in the water. More than twenty toads were captured within fifteen minutes, and nearly all those found in the water were males. They were found within a patch of tules, clinging to the stems, where water was up to eighteen inches deep. The body was held at right angles with the surface of the water and only the head projected above the surface. They usually stopped croaking when the light was brought near.

On the evening of May 17, the chorus began after dark at about 8 p. m. An hour later one toad was found in the camp and a five minute search along the dry bottom of an irrigation ditch close by and two hundred yards from the water yielded fourteen toads of which only two possessed the dark throat patches which characterize the males at this season. It was not apparent that they were moving toward the water; rather they seemed to be foraging. After one was killed, an insect larva which it had just caught was noticed in its mouth. Since only a few females, and no mating pairs, had been found in the water on the previous night, it seemed evident that most of the females had not yet gone to the water.

***Bufo compactilis* Wiegmann**

Sonoran Toad

Original description.—*Bufo compactilis* Wiegmann, Isis von Oken, vol. 26, pt. 7, 1833, p. 661 (Mexico).

Synonym for Nevada.—*Bufo lentiginosus woodhousii* Stejneger, 1893, p. 221.

Range.—In the United States from southern Nevada and Utah east to southeastern Oklahoma and south to the states of Michoacan and Tabasco in Mexico.

Occurrence in Nevada.—The known localities of occurrence are in the southeastern part of the state, in Meadow Valley, in the Virgin Mountains, and near Las Vegas. They range in altitude from 2,000 to 4,500 feet. Earliest date of capture was on March 23 (1923) at Las Vegas; others are in mid-June, August and October 9 (1913).

Nevada localities (Fig. 2) (30 specimens in Museum of Vertebrate Zoology).—

Lincoln County: Caliente (Calif. Acad. Sci.); Kershaw Cañon-Ryan State Park, 1 mile south of Caliente (Mus. Vert. Zool.); 7 and 21 miles south of Caliente (Mus. Vert. Zool.).

Clark County: Indian Spring, 4,000 feet, Virgin Mountains (Mus. Vert. Zool.); Las Vegas (Mus. Vert. Zool.; Calif. Acad. Sci.); Vegas Valley (U. S. N. M.).

Wright and Wright (1933, pp. 60–61) wrote of *Bufo compactilis*, as follows:

“Range: Southern portions of Utah and Nevada south far into Mexico, and east to Oklahoma and the eastern timber belt of Texas.

“Habitat: We found this toad breeding in rain pools in open fields near streams, in pools in creek valleys, in irrigation tanks or cattle tanks. It is a desert form that may at times be seen feeding at night under the street lights of desert towns.

“Size: Adults, 2 1/12–3 5/8 inches. (Males, 52–78 mm. Females, 54–91 mm.).

“General appearance: This broad, ‘squatty’ toad of medium size is pinkish drab in color, marked with dull citrine spots. The fingers and toes are light in color. The under parts are light. The back is covered with light tipped tubercles. In the male, the tip of the chin is white, then the folded part of the throat is pinkish buff with ecru-olive in the center. This area is followed by a circular pectoral area of purplish lilac.

“Structure: Parotoid, elongate, sometimes smooth; no sharp-edged ridge from eye to nostril, nostril area smooth; crown without bony ridges;

snout short, blunt; interorbital space about equal to upper eyelid; first finger at least equal to second; toes half webbed; sole tubercles large, each with a cutting edge; tympanum much smaller than the eye.

"Voice: The vocal sac is a large fat oblong 'sausage.' Deflated it forms a light apron covering several darker folds in the rear of the throat. The call is loud and shrill, a trill.

"Breeding: They breed from May 1 to July 10, or a few stragglers later, with the late summer rains. The brown and yellow eggs are in long fine coils, the jelly tube narrow, 1/12 inch (2 mm.), the eggs crowded, 14–20 eggs in 1 1/5 inches (30 mm.), the vitelli 1/16 inch (1.4 mm.). They hatch in 2 days. The bicolored tadpole is small, 1–1 1/8 inches (24–28 mm.), light colored, its back a drab or light grayish olive; its belly, pale cinnamon pink; its tail crests translucent. The tooth ridges are 2/3. After a tadpole period of 40 to 60 days, they transform, June 1 to August 1, at 1/2 inch (12 mm.)."

Selected differences between *woodhousii* and *compactilis* in typical form are indicated in the following tabulation of characters.

<i>woodhousii</i>	<i>compactilis</i>
Light vertebral streak.	No light vertebral streak.
Upper parts grayish or dull yellowish brown, blotched with a darker color or with scattered spots.	Upper parts light greenish gray or brown, irregularly spotted with darker color.
Cranial crests distinct, but not high.	Cranial crests absent, or poorly defined.
Parotoid glands twice as long as broad.	Parotoid glands reniform.
Tarsal fold indistinct or absent.	Tarsal fold present.
Head-and-body length 80–115 mm.	Head-and-body length 60–87 mm.

The relationships of *B. compactilis* to *B. woodhousii* in southern Nevada are difficult to interpret. The preserved specimens are not quite sufficient and there has been no opportunity to make a thorough study in the field. All the toads from Meadow Valley Wash, Indian Spring in the Virgin Mountains, and Vegas Valley agree fairly well with descriptions of *compactilis* and they are rather uniform structurally. Their occurrence in three far-separated places seems to suggest that the species moved into the region when it was more humid than it is now. These localities are

on the northwestern boundary of the range of the species. There would be little question concerning their identification except for the toads in the immediate vicinity of the Virgin and Colorado rivers. These show perceptible traces of *compactilis* characters, but they are here considered as belonging to the form *woodhousii* and their status is discussed under that heading.

The toads here considered as *compactilis*, from southern Nevada and Zion Cañon, Utah, have been compared with a small series (17 specimens) of *B. californicus* from southern California and Lower California. I can see no differences in structure between these series. In coloration they seem to differ in slight degree—the dark dorsal spots on the California ones being a little more distinct and larger. Moreover, the four preserved specimens from Las Vegas differ from the other Nevada ones to a greater degree in the opposite direction, being marked dorsally by very small, fine dark spots.

Geographically the gap between the Nevada and California specimens is not much greater than some of the gaps within the range commonly ascribed to *compactilis*. Apparently the Nevada toads deserve no greater than subspecific distinction from the California ones, if indeed they should not be treated as of the same race. The toads from Las Vegas appear more deserving of subspecific distinction.

A possible differing character is the shape of the inflated vocal sac. Myers (1930, p. 74) reports this as rounded in *californicus*. Both Dickerson (1906, fig. 96) and the Wrights (1933, p. 60) picture *compactilis* with an elongated, kidney-shaped vocal sac. No observations have been made to determine this character in the Nevada toads.

It is necessary, in making final taxonomic appraisal of toads, to study the living animals in their natural surroundings. Until further field studies can be made on this group of forms, satisfactory conclusions cannot be reached. However, the preserved material is sufficient to show that some changes in systematic treatment of the group will be required. Present indications are that these toads are all in the same species. The oldest name in the lot is *compactilis*. At least four races seem to deserve recognition, as follows:

- Bufo compactilis compactilis* Wiegmann 1833
- Bufo compactilis woodhousii* Girard 1856
- Bufo compactilis fowleri* Hinckley 1882
- Bufo compactilis californicus* Camp 1915

Bufo punctatus Baird and Girard

Red-spotted Toad

Original description.—*Bufo punctatus* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, p. 173 (Rio San Pedro, tributary of the Rio Grande del Norte = Devils River, Val Verde County, Texas).

Range.—Southeastern California and southwestern Utah, east to western Oklahoma and Texas, and south through Lower California and Mexico to San Luis Potosi and Guanajuato.

Occurrence in Nevada.—Found in April, 1936, along the Virgin River near Mesquite, in the Virgin Mountains, and in the Dead Mountains. The toads came after dark to springs and streams, sometimes when there was very little water. Daylight hours were spent in concealment, often in crevices in granite rocks. In the vicinity of Boulder Dam, individuals were found in the summer, of 1935, clinging to driftwood in the reservoir (Cowles and Bogert, 1936, p. 36).

Nevada localities (Fig. 4) (55 specimens in Museum of Vertebrate Zoology).—

Clark County: Virgin Springs, 2,000 feet, 8 miles north of Moapa (Mus. Vert. Zool.); Virgin River, 1 mile southwest of Mesquite, 1,500 feet (Mus. Vert. Zool.); Cabin Creek, 4,500 feet, Virgin Mountains (Mus. Vert. Zool.); Bitter Spring, Virgin Mountains (Mus. Vert. Zool.); Rogers Spring, 2,000 feet, 10 miles southwest of Overton (Mus. Vert. Zool.); Colorado River at mouth of Boulder Wash (Cowles and Bogert, 1936, p. 36); Hiko Spring, 2,000 feet, Dead Mountains (Mus. Vert. Zool.).

Bufo woodhousii Girard

Rocky Mountain Toad

Original description.—*Bufo woodhousii* Girard, Proc. Acad. Nat. Sci. Phila., 7, 1854, p. 86 ("New Mexico" [San Francisco Mountain, Coconino County, Arizona]).

Synonyms for Nevada.—*Bufo lentiginosus woodhousei*, Cope, 1889, p. 284.

Bufo lentiginosus subspecies *frontosus*, Yarrow, 1875, p. 520.

Bufo woodhousii woodhousii, Cowles and Bogert, 1936, p. 36.

Range.—Western United States and Mexico from Idaho east to the Missouri River and south to Sonora and southern Chihuahua.

Occurrence in Nevada.—Records are all in the southeastern part of the state, in the immediate vicinity of the Virgin and Colorado rivers. Altitudinally, the localities range from about 1,000 feet up nearly to 2,000 feet.

Nevada localities (Fig. 2) (94 specimens in Museum of Vertebrate Zoology).—

Clark County: Warm Springs, 2,000 feet, 8 miles north of Moapa (Mus. Vert. Zool.); Mesquite (Mus. Vert. Zool.; San Diego Soc. Nat. Hist.; Cowles and Bogert, 1936, p. 36); Bunkerville (Mus. Vert. Zool.); 2 miles southeast of Overton, 1,300 feet (Mus. Vert. Zool.); Kaolin Reservoir (Mus. Vert. Zool.); Saint Thomas (U. S. N. M.); Colorado River, 25 miles above Boulder Dam (Mus. Vert. Zool.); near mouth of Virgin River (Mus. Vert. Zool.).

Occurrence of this species has been attributed to northwestern Nevada by Taylor (1912, p. 342) and Kellogg (1932, p. 72) apparently on basis of specimens of *B. b. boreas* in the Museum of Vertebrate Zoology. The two specimens reported as this species by Stone (1911, p. 223) from Caliente, Lincoln County, are like specimens from farther south in the same valley and now in the Museum of Vertebrate Zoology. These have been included with *Bufo compactilis* in the present report. Also I have examined the two specimens (nos. 18,717–18, U. S. N. M.) taken March 13 and 14, 1893, in Vegas Valley, Clark County, and listed under *woodhousii* by Stejneger (1893, p. 221) and have included them with *B. compactilis*. The other toad listed by Stejneger (*loc. cit.*), taken on May 25, 1891, in Pahranaagat Valley, Lincoln County, resembles individuals in the large series from that vicinity which I have identified as *B. cognatus*.

Toads in the Muddy River Valley, along the Virgin River, and a little below the mouth of that river in the Colorado are nearest to *B. woodhousii* as it is represented in other parts of western United States, but they show some characters approaching *B. compactilis*. Size averages small as in the latter species. The light vertebral streak is indistinct in some specimens; the parotoid glands are shorter in some individuals than in normal *woodhousii*; cranial crests are poorly developed in some specimens. The population of toads in this area thus exhibits a wider range of variability than either *compactilis* or *woodhousii* in other regions. Characters of both species are represented but they seem to be predominantly *woodhousii*.

HYLIDAE

Hyla regilla Baird and Girard

Pacific Tree-toad

Original description.—*Hyla regilla* Baird and Girard, Proc. Acad. Nat. Sci. Phila., 6, 1852, p. 174 (Sacramento River [California], in Oregon and Puget Sound).

Synonyms for Nevada.—*Chorophilus triseriatus*, Stone, 1911, p. 224.

Pseudacris triseriata, Slevin, 1928, p. 120.

Range.—From southern British Columbia east to Idaho and Utah and south to northern Lower California and Arizona.

Occurrence in Nevada.—Apparently the tree-toad ranges over the whole state, but records indicate it is present at only scattered localities. Records are from both the valleys and the mountains; one is as high as 9,300 feet.

Nevada localities (Fig. 4) (208 specimens in Museum of Vertebrate Zoology).—

Washoe County: $\frac{1}{2}$ mile north of Vya, 6,000 feet (Mus. Vert. Zool.); Little High Rock Cañon (Mus. Vert. Zool.); Rock Creek, 7,425 feet, Granite Mountains (Mus. Vert. Zool.); Deep-hole (Mus. Vert. Zool.); $4\frac{1}{2}$ miles south of Flanigan, 4,100 feet (Mus. Vert. Zool.); Truckee River, 4,900 feet, near Verdi (Mus. Vert. Zool.); $5\frac{1}{2}$ miles north of Incline, 9,300 feet (Mus. Vert. Zool.).

Ormsby County: Carson City (U. S. N. M.).

Humboldt County: Virgin Valley (Mus. Vert. Zool.); Pine Forest Mountains (Mus. Vert. Zool.).

Elko County: Jarbidge Mountains (Mus. Vert. Zool.); James Creek and Carlin Peaks, Cortez Mountains (Univ. Mich. Mus.); 10 and 11 miles southwest of Midas (Mus. Vert. Zool.).

Eureka County: Eureka (Slevin, 1928, p. 116).

Nye County: Amargosa River, $3\frac{1}{2}$ miles northeast of Beatty (Mus. Vert. Zool.); 1 mile southeast of Beatty (Mus. Vert. Zool.); Oasis Valley (U. S. N. M.); Ash Meadows (U. S. N. M.); Pahump Valley (Slevin, 1928, p. 116).

Clark County: Cottonwood Springs and Mountain Spring, Charleston Mountains (U. S. N. M.); Younts Ranch, Pahump Valley (U. S. N. M.); Corn Creek (U. S. N. M.); Las Vegas (Mus. Vert. Zool.; Calif. Acad. Sci.); Vegas Valley, 1,800 feet (U. S. N. M.).

Tree-toads captured on September 2, 1909, at Las Vegas, Nevada, were reported by Stone (1911, p. 224) as *Chorophilus triseriatus*. Later

lists have included this species from Nevada under the name *Pseudacris triseriata* apparently on the basis of this record. In response to an enquiry about the three specimens (nos. 17,876–78, Acad. Nat. Sci. Phila.), H. W. Fowler wrote to me on March 5, 1936, that he had been unable to locate them in the collection. Since the identification cannot be verified and the locality is far from the nearest other record stations for the species in northeastern Utah and central Arizona, it seems best to have further evidence before accepting this as a Nevada species.

In Elko County, tree-toads were collected in James Cañon by Ruthven and Gaige (1915, p. 14). Early in August many partly grown ones were found under stones and in sagebrush around two small ponds. Two adults were obtained in rock slides on Carlin Peaks, one near a spring and the other several miles from water.

Taylor (1912, p. 343) on July 31, 1909, noted tadpoles and young tree-toads in a lake at Duffer Peak Meadow, 8,400 feet, in the Pine Forest Mountains, Humboldt County.

RANIDAE

Rana aurora draytonii Baird and Girard

Red-legged Frog

Original description.—*Rana Draytonii* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, p. 174 (San Francisco, California).

Range.—This race occupies a narrow strip of land next to the Pacific coast from near Mendocino City, Mendocino County, California, south to the Santo Domingo River, Lower California.

Occurrence in Nevada.—Known only from certain springs on the floor of Smoky Valley, 5,500 feet, Nye County, in the center of the state, where according to local testimony individuals of this frog brought from California were liberated several years ago by a Mr. Gendron who still lives in the valley.

Nevada locality (1 specimen in Museum of Vertebrate Zoology).—

Nye County: Millett P. O. (Mus. Vert. Zool.).

Rana boylei sierrae Camp

Sierra Nevada Yellow-legged Frog

Original description.—*Rana boylei sierrae* Camp, Univ. Calif. Publ. Zool., vol. 17, 1917, p. 120 (Matlack Lake, 10,500 feet, 2 miles south of Kearsarge Pass, Inyo County, California).

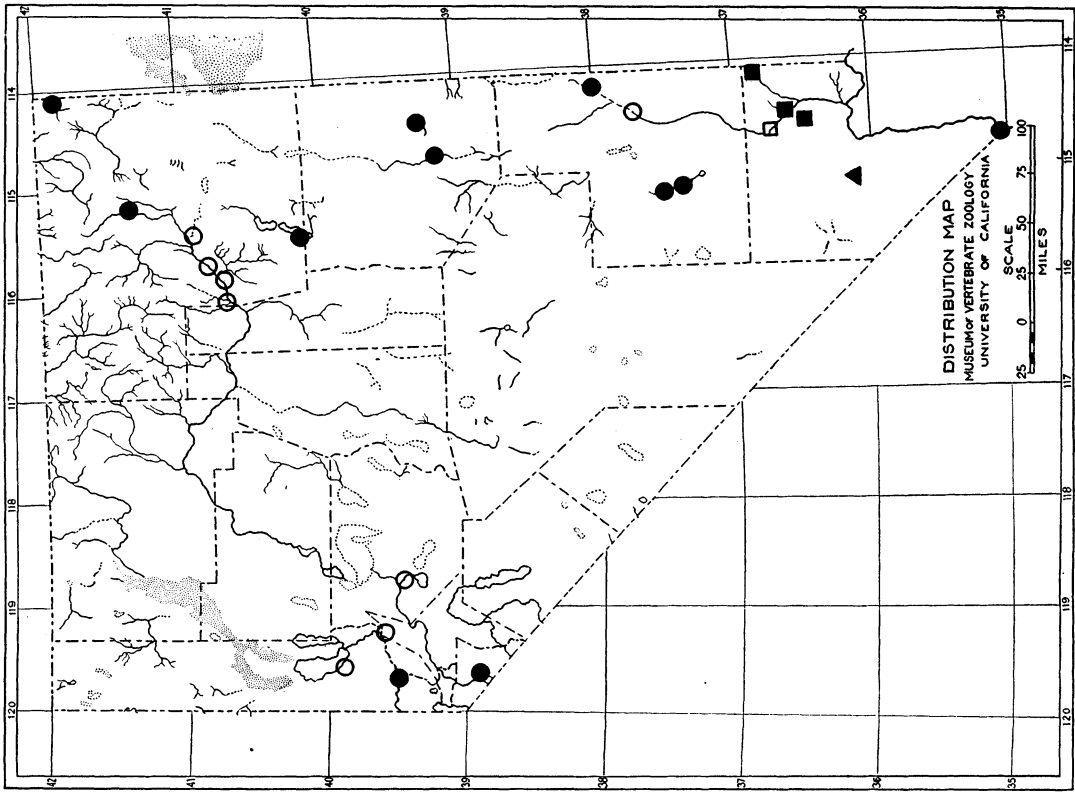


FIG. 5. Distribution of *Rana pipiens* (circles), *Rana onca* (squares), and *Rana fisheri* (triangle) in Nevada.

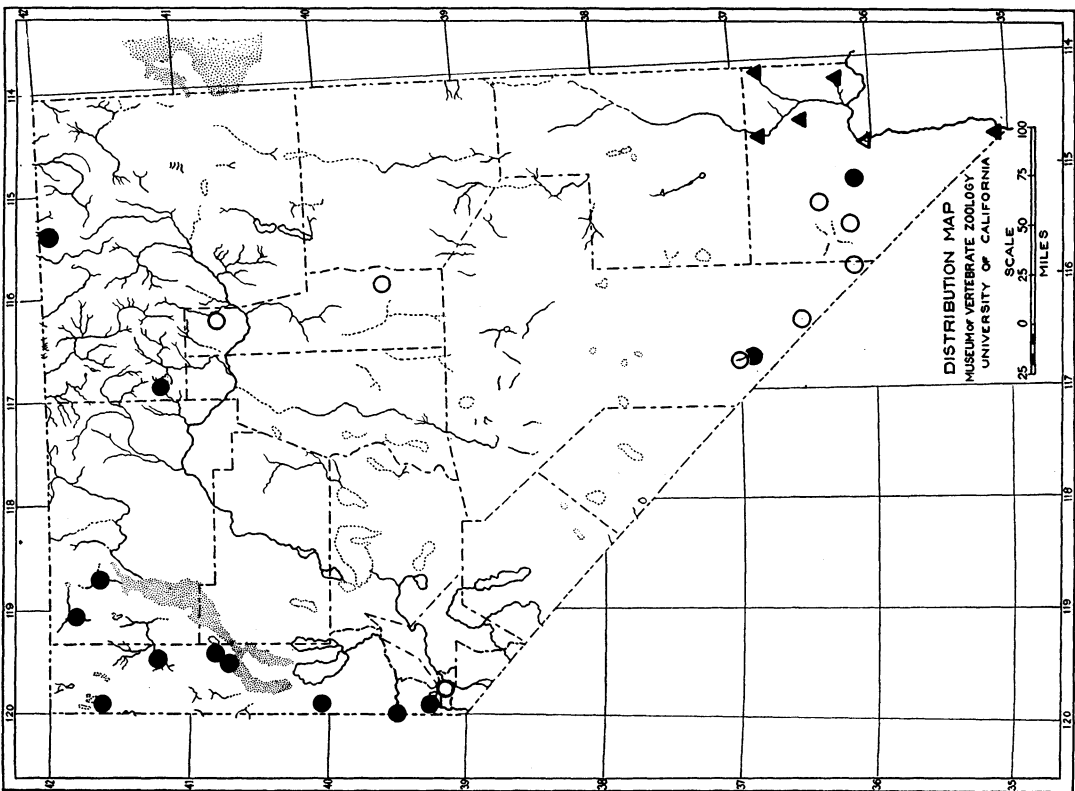


FIG. 4. Distribution of *Hyla regilla* (circles) and *Bufo punctatus* (triangles) in Nevada.

Synonyms for Nevada.—*Rana pretiosa*, Slevin, 1928, p. 136.

Rana temporaria pretiosa, Cope, 1889, p. 434.

Range.—Occurs only on the high parts of the central and southern Sierra Nevada, mainly in California.

Occurrence in Nevada.—Has been collected in the vicinity of Lake Tahoe and northward on the slopes of Mount Rose. Records range from 6,300 feet to 9,300 feet and, seasonally, from June 12 to August 21. The frogs were found along small streams and in small shallow lakes in meadows.

Nevada localities (18 specimens in Museum of Vertebrate Zoology).—

Washoe County: 5½ miles north of Incline, 9,300 feet, and Incline, at north end of Lake Tahoe (Mus. Vert. Zool.); 3 miles south of Mount Rose, 8,500 feet (Mus. Vert. Zool.); Lake Tahoe (U. S. N. M.).

Four specimens in U. S. N. M. from Lake Tahoe and evidently the basis for record of *Rana pretiosa* from that locality (see Slevin, 1928, p. 136) were examined by me on November 7, 1933. I identified them as *R. b. sierrae*.

***Rana catesbeiana* Shaw**

Bullfrog

Original description.—*Rana catesbeiana* Shaw, Gen. Zool., vol. 3, pt. 1, 1802, p. 106, pl. 33 (South Carolina).

Range.—Originally North America east of Rocky Mountains from southern Canada to northern Mexico. Has been transplanted to many localities in western United States.

Occurrence in Nevada.—Introduced at Ash Meadows, 2,173 feet, where a specimen was obtained on May 20, 1933, by W. C. Russell, and another on May 3, 1936 (Linsdale). One was heard on April 26, 1936, at Kaolin Reservoir, Clark County (Linsdale, MS).

Nevada locality (2 specimens in Museum of Vertebrate Zoology).—

Nye County: Ash Meadows (Mus. Vert. Zool.).

***Rana fisheri* Stejneger**

Nevada Frog

Original description.—*Rana fisheri* Stejneger, N. Amer. Fauna no. 7, 1893, p. 227 (Vegas Valley, Clark County, Nevada).

Synonym for Nevada.—*Rana onca*, Slevin, 1929, p. 127.

Range.—Known only from the vicinity of Las Vegas, Vegas Valley, Clark County, Nevada.

Occurrence in Nevada.—Inhabits the springs and short streams in the near vicinity of Las Vegas, close to 2,000 feet elevation. These frogs are most active in spring and early summer; dates of capture range from early in March to August 13.

Nevada localities (Fig. 5) (17 specimens in Museum of Vertebrate Zoology).—

Clark County: vicinity of Las Vegas (Mus. Vert. Zool.; Calif. Acad. Sci.; U. S. N. M.).

Stejneger (1893, p. 227) described *Rana fisheri* from Vegas Valley, Nevada, as follows: "Heel of extended hind limb reaching anterior eye canthus, falling considerably short of tip of snout; vomerine teeth between and projecting posteriorly beyond choanae; no black ear patch; vertical diameter of tympanic disc greater than distance between nostrils and eye; hind feet webbed for about two-thirds; one small metatarsal tubercle; one weak dorso-lateral dermal fold, no dorsal folds between; posterior lower aspect of femur granular; back and sides with numerous small, distinct, dark spots, surrounded by lighter; no external vocal sacs." He added that "the great size of the tympanic disc is also quite characteristic, being larger than in any of our species, except *R. catesbeiana*, *clamitans*, and *septentrionalis*."

For many years this form has been considered a synonym of *Rana onca* which was known from the single type specimen obtained by Yarrow in 1872 in "Utah." So few specimens have been available from southern Utah and southern Nevada that the relationships of the frogs in that area could not be studied satisfactorily. With the series now available from this region along with a study of the physiography of the area, I have been able to come to conclusions as follows: The population of frogs in Vegas Valley is sharply isolated from the closely related ones in the Colorado and Virgin river valleys. Although other colonies of *Rana* are isolated in eastern and southern Nevada, they have become less markedly differentiated from the common type of southwestern *Rana pipiens*. Whether the frogs of southern Utah and Nevada need separate recognition under the name *onca* as a species or subspecies cannot be determined without a study of the whole species throughout its range, but it seems plain to me that the Vegas Valley ones should be recognized as distinct. Although entered here as a species, this form is obviously closely related to *Rana pipiens* and it might well be known as a race

of that species. It contrasts most sharply with that frog in its peculiar shade of ground color, the reduction of dorsal spots, especially on the head, the enlarged tympanum, and in the reduced hind legs.

***Rana onca* Cope**

Nevada Frog

Original description.—*Rana onca* Cope, in Yarrow, Rept. Geog. and Geol. Expl. and Surv. west of 100th mer. (= Wheeler Survey), vol. 5, Zool., 1875, p. 528, pl. 25, figs. 1-3 (Utah).

Range.—Known only from the vicinity of the Virgin River in southern Nevada and Utah.

Occurrence in Nevada.—Inhabits streams and springs in southeastern part of the state; localities are along the Virgin and Lower Muddy rivers. They range in altitude from about 1,200 feet up to around 2,000 feet.

Nevada localities (Fig. 5) (78 specimens in Museum of Vertebrate Zoology).—

Clark County: Virgin River, 1,500 feet, near Mesquite (Mus. Vert. Zool.); Glendale (U. C. L. A.); 2 miles southeast of Overton, 1,300 feet (Mus. Vert. Zool.); Rogers Spring, 2,000 feet, 10 miles southwest of Overton (Mus. Vert. Zool.).

According to Tanner (1931, p. 189) *Rana onca* differs from *R. pipiens* "in having no definite narrow longitudinal folds between the dorsolateral ridges, its smaller size, and habitat in the extreme southwestern corner of Utah along the Virgin River. The head is as broad as long and depressed; the nostrils are nearer the eyes than the end of the snout; canthus rostralis almost absent in the specimens before me. Tympanic membrane large and smooth. The limbs are well developed, digits long and webs well formed. Skin above smooth with a few warts and tubercles about the head and neck.

"The general color above is brown to olive green with spots that are bordered with grey. The noticeable dorso-lateral fold is brown in the specimens examined. The undersurface is white over the belly and yellowish on the legs."

Recently collected series of specimens from several localities near the Virgin River indicate that this form is distinct from both *Rana pipiens* and *Rana fisheri*. From the former it differs by having smaller and fewer spots and these on a paler background and with less distinct gray borders, larger tympanum, and shorter legs. It is nearer to *fisheri* which reaches the extreme development in these characters, having still

fewer dorsal spots and much shorter hind legs. The characters of smaller size and absence of longitudinal folds between dorsolateral ridges seem not to be diagnostic in the Nevada material.

***Rana pipiens* Schreber**

Leopard Frog

Original description.—*Rana pipiens* Schreber, Naturforscher, vol. 18, 1782, p. 185, pl. 4 (New York).

Synonyms for Nevada.—*Rana halecina berlandieri*, Yarrow, 1883, p. 181.

Rana virescens brachycephala, Cope, 1889, p. 405.

Range.—Widespread in North America east of the Sierra Nevada and south into Mexico.

Occurrence in Nevada.—Recorded from many lakes and larger streams in the state, mainly in the northern and eastern parts; also present in the immediate vicinity of the Colorado River. Localities of record, outside the Colorado Valley, are mainly at altitudes between 4,000 and 6,000 feet. This is the commonest and most widespread kind of frog in the state.

Nevada localities (Fig. 5) (94 specimens in Museum of Vertebrate Zoology).—

Washoe County: The Willows, Pyramid Lake (Slevin, 1928, p. 125); Truckee River, 4900 feet, near Verdi (Mus. Vert. Zool.); Truckee River, 9½ miles east of Reno (Mus. Vert. Zool.).

Douglas County: Minden (Mus. Vert. Zool.).

Lyon County: Near Fernley (U. S. N. M.); 1 mile southeast of Fernley (Univ. Mich. Mus.).

Elko County: Marys River, 22 miles north of Deeth (Mus. Vert. Zool.); Goose Creek, 5,000 feet (Mus. Vert. Zool.); Humboldt River Valley (Univ. Mich. Mus.); Susan Creek (Univ. Mich. Mus.); Maggie Creek (Univ. Mich. Mus.); Moleen Cañon (Univ. Mich. Mus.); 3 miles south of Halleck (U. S. N. M.); west side of Ruby Lake (Mus. Vert. Zool.); Elko (Calif. Acad. Sci.); Carlin (Calif. Acad. Sci.).

Churchill County: Near Fallon (U. S. N. M.).

White Pine County: Cleveland Ranch, Spring Valley (Mus. Vert. Zool.); Steptoe Creek, 6,100 feet, 5½ miles southeast of Ely (Mus. Vert. Zool.).

Lincoln County: 3½ miles north of Eagle Valley, 5,600 feet (Mus. Vert. Zool.); Crystal Spring, 2 miles south, and 3 miles north (Mus. Vert. Zool.); Pahrnatagat Valley (U. S. N. M.); 4

miles south of Alamo (Mus. Vert. Zool.); Caliente (Calif. Acad. Sci.).

Clark County: Colorado River, opposite Fort Mojave (Mus. Vert. Zool.).

The leopard frog was reported as common in the upper Humboldt Valley by Ruthven and Gaige (1915, p. 12). Adults were found in the water of stagnant pools or on their banks, and only occasionally in running water. They were shy and hard to capture. Stomachs contained small toads, a few tadpoles, and insects. Specimens taken on July 18, contained eggs. The ground color in life was almost invariably dark gray, only one green one was obtained; small and recently transformed ones were grayish brown with small, round, dark brown spots.

On May 18, 1932, at Crystal Spring, Lincoln County, Fitch (MS) recorded in his notes that fourteen mouse traps put out the night before along the creek from Crystal Spring to a point 100 yards east, all in thick rushes on damp ground and within a few inches of the water, held two leopard frogs and two harvest mice (*Reithrodontomys*) in the morning.

***Rana pretiosa luteiventris* Thompson**

Spotted Frog

Original description.—*Rana pretiosa luteiventris* Thompson, Proc. Biol. Soc. Wash., vol. 26, 1913, p. 53 (Annie Creek, Elko County, Nevada).

Synonym for Nevada.—*Rana pretiosa*, Slevin, 1928, p. 136.

Range.—Southeastern Washington, Idaho, eastern Oregon, northeastern California, and northern Nevada.

Occurrence in Nevada.—All localities so far reported for this frog are in southwestern Elko County, in the upper part of the Humboldt Valley, and in northern Humboldt County. In altitude they are close to 5,000 feet.

Additional specimens (Univ. Mich.) collected in 1938 by C. L. Hubbs from the Reese River Valley in Lander and Nye counties extend the known range of this frog more than 100 miles southward.

The specimen from Lake Tahoe, reported as this species (Slevin, 1928, p. 136), was examined by me on November 7, 1933, in the U. S. N. M. It proved to be *R. b. sierrae*.

Nevada localities (1 specimen in Museum of Vertebrate Zoology).—

Humboldt County: Quinn River, near McDermitt (Stan. Univ.).

Elko County: Annie Creek (Univ. Mich.); Maggie Creek (Univ. Mich.); Humboldt River Valley (Univ. Mich.).

Eureka County: Pine Creek, 2 miles east of Palisade (Mus. Vert. Zool.).

These frogs were found by Ruthven and Gaige (1915, p. 13) along the edges of flowing streams or with their heads projecting above the vegetation of ponds. They were very shy and disappeared quickly when disturbed, but usually reappeared within a short time in about the same place.

REPTILIA

Subclass Diapsida

Order Squamata

Suborder Sauria

GEKKONIDAE

***Coleonyx variegatus* (Baird)**

Banded Gecko

Original description.—*Stenodactylus variegatus* Baird, Proc. Acad. Nat. Sci. Phila., vol. 12, 1858 (1859), p. 254 (Rio Grande and Gila valleys = Colorado Desert, in southern California).

Range.—Southern California and northern Lower California east to southwestern Utah and Texas.

Occurrence in Nevada.—Several specimens represent localities south from 37° N. to the Colorado River. Altitudinally, the species has been captured up to 4,000 feet. The animals are active at night and are sometimes found in the daytime beneath rocks or other shelter on the ground.

Nevada localities (Fig. 6) (9 specimens in Museum of Vertebrate Zoology).—

Nye County: Amargosa River, 3½ miles north-east of Beatty (Mus. Vert. Zool.).

Clark County: Mouth of Kyle Cañon, 4,000 feet, Charleston Mountains (Cowles and Bogert, 1936, p. 37); Glendale (Klauber, 1932, p. 120); Jean (Mus. Vert. Zool.); Colorado River, 20 miles above Boulder Dam (Mus. Vert. Zool.); near mouth of Virgin River (Mus. Vert. Zool.); Colorado River near Boulder Dam (Cowles and Bogert, 1936, p. 37); Colorado River, 5 miles north of California boundary (Mus. Vert. Zool.).

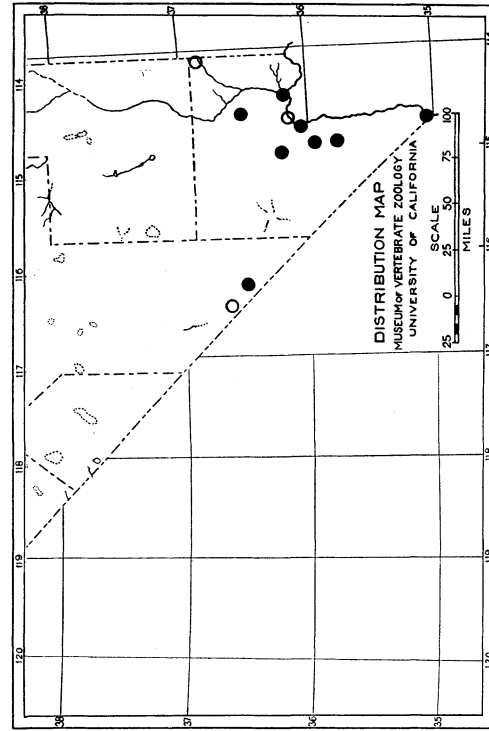


FIG. 7. Distribution of *Dipso-saurus dorsalis dorsalis* in southern Nevada.

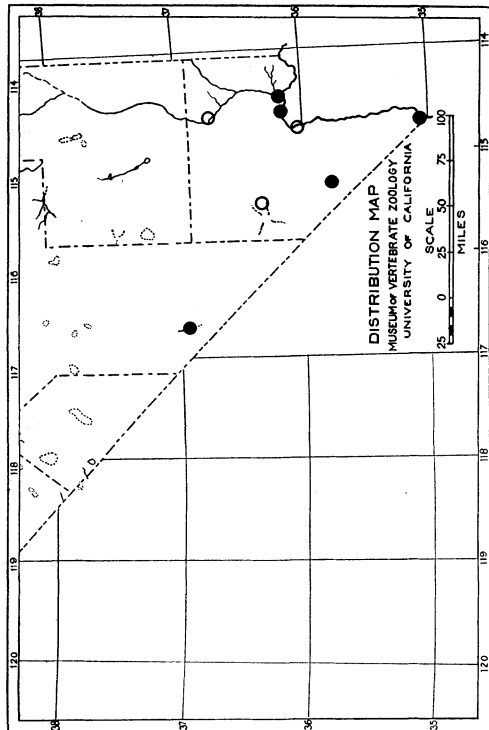


FIG. 6. Distribution of *Coleonyx variegatus* in southern Nevada.

IGUANIDAE

Dipso-saurus dorsalis dorsalis

(Baird and Girard)

Desert Iguana

Original description.—*Crotaphytus dorsalis* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, p. 126 (Colorado Desert, California).

Synonym for Nevada.—*Dipsosaurus dorsalis*, Van Denburgh, 1897, p. 46.

Range.—Desert areas of southeastern California, southern Nevada and adjacent parts of Utah, Arizona and south to central Lower California.

Occurrence in Nevada.—Specimens have been captured on the Amargosa Desert and in the near vicinity of the Virgin and Colorado rivers.

Nevada localities (Fig. 7) (31 specimens in Museum of Vertebrate Zoology).—

Nye County: Amargosa Desert (U. S. N. M.); 3 miles northeast of Fairbanks Spring (Mus. Vert. Zool.).

Clark County: Mesquite (Woodbury, 1931, p. 22); Callville (U. S. N. M.); near mouth of Virgin River (Mus. Vert. Zool.); Atlatl Rock, 2,000 feet, Valley of Fire (Mus. Vert. Zool.); 10 miles northeast of Las Vegas, 2,000 feet (Mus. Vert. Zool.); Colorado River, 3 and 12 miles above Boulder Dam (Mus. Vert. Zool.); vicinity of Boulder City (Cowles and Bogert, 1936, p. 37); 25 miles south of Las Vegas, on Searchlight road (Mus. Vert. Zool.); Hiko Spring, 2,000 feet, Dead Mountains (Mus. Vert. Zool.); 2 miles northwest of Fort Mojave, 500 feet (Mus. Vert. Zool.); Colorado River, 5 miles north of California boundary (Mus. Vert. Zool.); 22 miles north of Searchlight (Mus. Vert. Zool.).

Most of the thirty-one specimens (in Mus. Vert. Zool.) from Nevada show distinct longitudinal dark lines on the sides of the body. Nine have two full rows of granules, on both sides, between rostral and nasal scales; 13 have at least one granule on each side touching both rostral and nasal; eight have a complete double row of granules on one side and at least one single granule on the other; one has a single granule on one side and the other damaged.

Crotaphytus collaris baileyi Stejneger

Collared Lizard

Original description.—*Crotaphytus baileyi* Stejneger, N. Amer. Fauna, 3, 1890, pp. 103–105, pl.

12, fig. 1 (Painted Desert, Little Colorado River, Arizona).

Synonyms for Nevada.—*Crotaphytus collaris*, Yarrow, 1883, p. 52.

Crotaphytus collaris baileyi, Stone, 1911, p. 224.

Crotaphytus baileyi, Van Denburgh, 1897, p. 56.

Range.—Eastern Oregon and southern Idaho east through Utah and Colorado to western New Mexico and southwestern Texas, and south to Lower California and northern Mexico. Another race, closely related, occupies the territory south of the 40th parallel east to the Mississippi River.

Occurrence in Nevada.—Collared lizards live throughout the state, but they are restricted locally to a rather specialized habitat. Rocks make up the most conspicuous indicator of this suitable habitat; they are used in several ways by the lizards. They tend to be present in large numbers around the bases of mountain ranges. Fewness of records in the southern part of the state seems to indicate considerably reduced numbers there compared with the higher deserts. Most of the localities are between altitudes of 4,000 and 6,500 feet, but they extend from 1,000 to 7,500 feet.

Nevada localities (Fig. 8) (105 specimens in Museum of Vertebrate Zoology).—

Washoe County: Truckee River, between Reno and Pyramid Lake (U. S. N. M.); Derby (U. S. N. M.); Smoke Creek (U. S. N. M.); Smoke Creek Desert (U. S. N. M.); 1 mile northeast of Gerlach, 4,000 feet (Mus. Vert. Zool.); 1 mile west of Derby (Univ. Mich.); Pyramid Lake Indian Agency (U. S. N. M.); 7 miles east of Vista (U. S. N. M.); 6 miles south of Pahrump Peak (Mus. Vert. Zool.).

Lyon County: Mason, 4,500 feet (Van Denburgh, 1922, p. 108); Dayton (Calif. Acad. Sci.); 29 and 23 miles west of Fallon, 4,300 feet (Mus. Vert. Zool.).

Humboldt County: Thousand Creek Basin (Mus. Vert. Zool.); Limestones (Mus. Vert. Zool.); Big Creek Ranch (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.).

Pershing County: South slope Granite Peak, East Range (Mus. Vert. Zool.); 12 miles west and 2 miles south of Lovelock, 5,100 feet (Mus. Vert. Zool.).

Churchill County: near Fallon (U. S. N. M.); mountains east of Stillwater (U. S. N. M.); 3 miles west and 7 miles east of Frenchman's

Station (U. S. N. M.); no locality given (Burt, 1928, p. 15).
 Eureka County: Cortez Mountains at Humboldt River (Univ. Mich.).
 White Pine County: Mt. Moriah near Smith Creek Cave (Mus. Vert. Zool.).
 Mineral County: Endowment Mine (Mus. Vert. Zool.).
 Esmeralda County: Palmetto Mountains (Richardson, 1915, p. 406).
 Nye County: Ridge north of Wisconsin Creek, 7,500 feet (Mus. Vert. Zool.); North Twin River, 6,500 feet (Mus. Vert. Zool.); South Twin River, 6,500 feet (Mus. Vert. Zool.); Wall Cañon, 6,500 feet (U. S. N. M.); north Kingstons Mountains (Van Denburgh, 1922, p. 108); Tonopah (Calif. Acad. Sci.); Rhyolite (Calif. Acad. Sci.); Oasis Valley (U. S. N. M.); Current (Bentley, 1919, p. 88); $1\frac{1}{2}$ miles southwest of Cactus Spring, Cactus Range (Mus. Vert. Zool.); 2 miles northwest of Indian Spring, Belted Range (Mus. Vert. Zool.); 6, 8, and 9 miles east of Cliff Spring (Mus. Vert. Zool.); White River Valley, 14 miles west-southwest of Sunnyside (Mus. Vert. Zool.); Hot Creek Range, 6,700 feet, 8 miles west of Tybo (Mus. Vert. Zool.).
 Lincoln County: vicinity of Crystal Spring (Mus. Vert. Zool.); Ash Spring (Mus. Vert. Zool.); 22 miles east of Panaca (U. S. N. M.); Caliente (Calif. Acad. Sci.); Quartz Spring in Desert Mountains (U. S. N. M.); Juniper Mountains (Van Denburgh, 1922, p. 108).
 Clark County: vicinity of Boulder City (Cowles and Bogert, 1936, p. 37); 19 miles south of Las Vegas, 2,000 feet (Mus. Vert. Zool.); Atlatl Rock, 2,000 feet, Valley of Fire (Mus. Vert. Zool.).

Out of the 99 specimens in the Museum of Vertebrate Zoology, 96 have two distinct rows of interorbital scales. Three have one pair of these scales fused into a single scale.

In the Lahontan Basin, Richardson (1915, p. 407) found collared lizards only on hillsides among deposits of tufa and outcroppings of volcanic rock at an elevation of 4,500 feet. Ruthven and Gaige (1915, p. 17) in Eureka County, Nevada, found the species in only one place—the rocky summits of the Cortez Mountains. They found not more than six in four or five hours work, and many days they found none. One or two were on the ground, the rest on rocks. Because this lizard was usually on the tops of rocks or clinging to slopes and not on cliffs, it was con-

cluded that it was a poorer climber than *Sceloporus occidentalis* or *Uta stansburiana*. When alarmed they rushed down into crevices. Stomachs contained insects and spiders.

In the neighborhood of Crystal Spring, Pahranagat Valley, Fitch (MS) on May 20, 1932, collected several and saw others in small rocky ravines and along the sides of ridges. They sometimes escaped down a hole, but usually ran beneath the nearest rock. If the rock were turned over, the lizards seemed greatly confused, running off into the bushes and then returning several times to the spot where the rock had been before finally concealing themselves under another rock. On June 1, at 5,900 feet, north of Cliff Spring in Nye County, the same observer found this species in boulder strewn areas in foothills, where there was also gravel. It was found down in the sagebrush area where rocky ravines extended down into it. One young individual was shot after it had run under the edge of a sage bush. All others, when alarmed, hid under boulders. In the White River Valley, Nye County, on June 8, Fitch found one which was clinging to a boulder, just before sunset and which allowed him to approach and capture it by hand before showing sign of alarm. Another, found shortly after sunset the same day, was in a refuge place beneath a boulder.

***Crotaphytus wislizenii* Baird and Girard**

Leopard Lizard

Original description.—*Crotaphytus Wislizenii* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, p. 69 (Near Santa Fé, New Mexico).

Synonym for Nevada.—*Crotaphytus wislizeni*, Yarrow, 1883, p. 53.

Range.—Western United States from southern Oregon and Idaho south through Lower California and to northwestern Sonora; from eastern California to Texas.

Occurrence in Nevada.—Widespread in the valleys and flats throughout the state, but especially common on the plateau at altitudes between 4,000 and 6,000 feet.

Nevada localities (Fig. 9) (221 specimens in Museum of Vertebrate Zoology).—

Washoe County: Near Reno (Calif. Acad. Sci.); Smoke Creek Desert (U. S. N. M.); Smoke Creek, 3,900 feet (Mus. Vert. Zool.); 1 mile south of Warm Spring (Mus. Vert. Zool.); Flanigan, 4,200 feet (Mus. Vert. Zool.); $4\frac{1}{2}$ miles south of Flanigan, 4,100 feet (Mus. Vert.

- Zool.); 2 miles northeast of Sand Pass (Mus. Vert. Zool.); Fox Cañon, south of Pahrum Peak (Mus. Vert. Zool.); north end of Pyramid Lake (Mus. Vert. Zool.); 1 mile northwest of The Needles (Mus. Vert. Zool.); near Sutcliffe (Calif. Acad. Sci.); Pyramid Lake Indian Agency (U. S. N. M.); Truckee River 12 and 1 miles northwest of Wadsworth (Mus. Vert. Zool.); Wadsworth (U. S. N. M.).
- Ormsby County: Carson City (U. S. N. M.).
- Lyon County: Mason Valley, 12 miles east of Wellington (Mus. Vert. Zool.); 12 miles south of Yerington (Mus. Vert. Zool.); 22 miles west of Fallon (Mus. Vert. Zool.); $6\frac{1}{2}$ miles east of Dayton (Mus. Vert. Zool.).
- Humboldt County: Big Creek Ranch (Mus. Vert. Zool.); Alder Creek (Mus. Vert. Zool.); Leonard Creek (Mus. Vert. Zool.); Thousand Creek Flat (Mus. Vert. Zool.); Limestones (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.); Amos (Mus. Vert. Zool.); Winnemucca (Univ. Mich. Mus.); 23 miles northwest of Battle Mountain (Mus. Vert. Zool.); 7 miles north of Winnemucca (Mus. Vert. Zool.); Golconda (U. S. N. M.); 1 mile south of Golconda (Mus. Vert. Zool.).
- Elko County: Annie Creek (Univ. Mich.); Carlin (Calif. Acad. Sci.).
- Pershing County: Rabbit Hole, Mount Playa (U. S. N. M.); 3 miles south of Vernon, 4,200 feet (Mus. Vert. Zool.); 2 miles west of Toulon (Mus. Vert. Zool.); 30 miles west and 4 miles north of Lovelock, 4,300 feet (Mus. Vert. Zool.); 21 miles west and 2 miles north of Lovelock, 4,000 feet (Mus. Vert. Zool.); west base Granite Peak, East Range (Mus. Vert. Zool.).
- Churchill County: Mountain Well (Mus. Vert. Zool.); Hazen (U. S. N. M.); 7 miles west of Frenchman's Station (Univ. Mich.); 2 miles east of Sand Springs (U. S. N. M.).
- Lander County: 15 miles north of Battle Mountain (Mus. Vert. Zool.); Battle Mountain (U. S. N. M.); 26 miles north of Austin (Mus. Vert. Zool.); Smoky Valley, between Birch and Kingston creeks (Mus. Vert. Zool.); Kingston Creek, 6,200 feet (Mus. Vert. Zool.); 8 and 10 miles northeast of Tenabo (Mus. Vert. Zool.).
- Eureka County: Beowawe (U. S. N. M.); 14 and 18 miles northeast of Tenabo (Mus. Vert. Zool.).
- White Pine County: Baker (Mus. Vert. Zool.); Antelope Springs (Van Denburgh, 1922, p. 123); Snake Creek (Van Denburgh, 1922, p. 123).
- Mineral County: 6 miles northeast of Pine Grove (Mus. Vert. Zool.); 3 and 8 miles south of Schurz (Mus. Vert. Zool.); Huntoon Valley, 6,700 feet (Mus. Vert. Zool.); Hawthorne (Van Denburgh, 1922, p. 122).
- Esmeralda County: 15 miles south of Tonopah (Mus. Vert. Zool.); Gap Spring (Mus. Vert. Zool.); 7 miles north and 7 miles east of Arlemont (Mus. Vert. Zool.); Arlemont (Mus. Vert. Zool.); Chiatovich Creek, 7,000 feet (Mus. Vert. Zool.); Fish Lake (Mus. Vert. Zool.); Mount Magruder (U. S. N. M.); $13\frac{1}{2}$ miles northwest of Goldfield (Mus. Vert. Zool.); Goldfield (Calif. Acad. Sci.); Grapevine Mountains (U. S. N. M.).
- Nye County: Wisconsin Creek, 6,000 feet (Mus. Vert. Zool.); South Twin River, 6,000 feet (Mus. Vert. Zool.); Peavine Creek, 6,200 feet (U. S. N. M.); vicinity of Millett P. O., Smoky Valley (Mus. Vert. Zool.); Cloverdale Ranch (Mus. Vert. Zool.); Round Mountain (U. S. N. M.); Tonopah (Calif. Acad. Sci.); 8 to 14 miles southeast of Tonopah (Mus. Vert. Zool.); Currant (Bentley, 1919, p. 89); Rhyolite (Calif. Acad. Sci.); Oasis Valley (U. S. N. M.); Amargosa Desert (U. S. N. M.); 22 miles southeast of Beatty (Mus. Vert. Zool.); Pahump Valley (U. S. N. M.); $7\frac{1}{2}$ miles east of Cliff Spring, 5,900 feet (Mus. Vert. Zool.); Garden Valley (Mus. Vert. Zool.); White River Valley, 15 miles southwest of Sunnyside (Mus. Vert. Zool.); Hot Creek Valley, $5\frac{1}{2}$ and $6\frac{1}{2}$ miles east of Hot Creek (Mus. Vert. Zool.); Amargosa Desert (U. S. N. M.).
- Lincoln County: 9 and 16 miles east of Groom Baldy (Mus. Vert. Zool.); Penoyer Valley, 14 miles north-northwest of Groom Baldy (Mus. Vert. Zool.); $\frac{1}{4}$ mile south of Hiko (Mus. Vert. Zool.); Crystal Spring (Mus. Vert. Zool.); Pahrangat Valley (U. S. N. M.); Caliente (U. S. N. M.); Panaca (U. S. N. M.); Quartz Spring (U. S. N. M.); Timpahute Mountains (U. S. N. M.).
- Clark County: Cottonwood Spring, Charleston Mountains (U. S. N. M.); Indian Spring Valley (U. S. N. M.); Vegas Valley (U. S. N. M.); 3 miles south of Mesquite, 2,500 feet (Mus. Vert. Zool.); Saint Thomas (U. S. N. M.); Piute Valley, 10 miles south of Searchlight and 1 mile north of California line (Klauber, 1932, p. 121); 14 miles northeast of Searchlight, 3,500 feet (Mus. Vert. Zool.); Boulder City (Klauber, 1932, p. 121; Cowles and Bogert, 1936, p. 37); 5 miles west of Hiko Spring (Mus. Vert. Zool.);

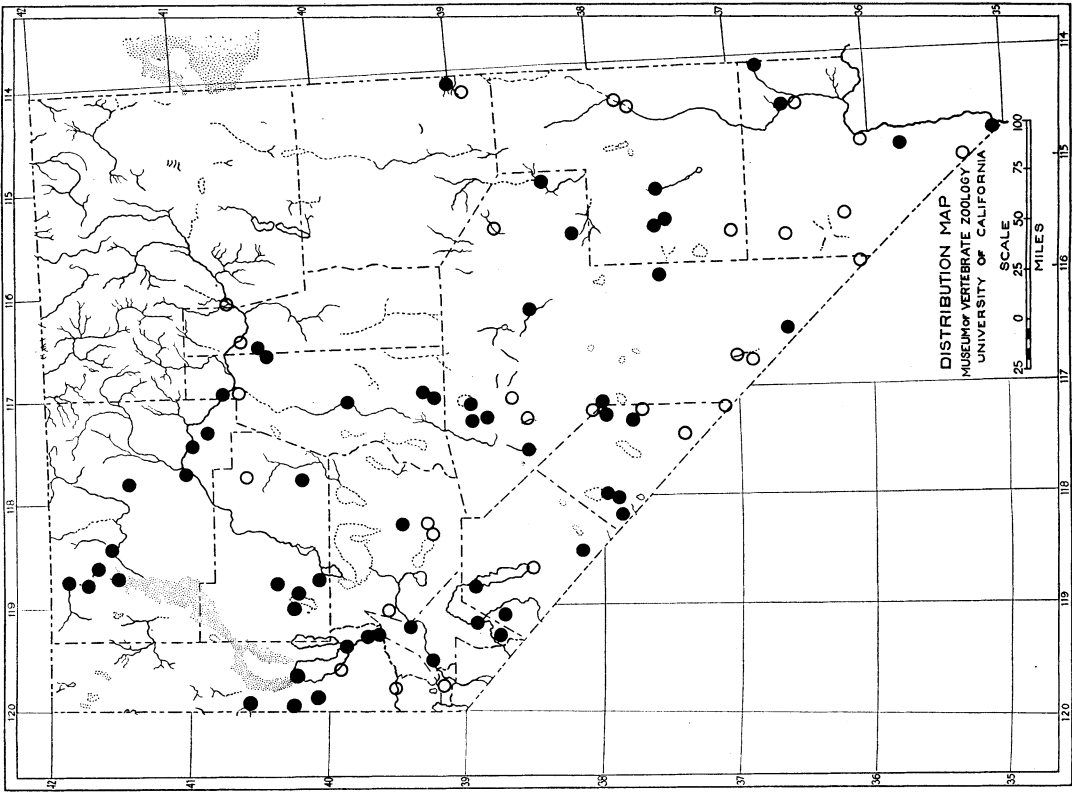


FIG. 9. Distribution of *Crotaphytus wislizenii* in Nevada.

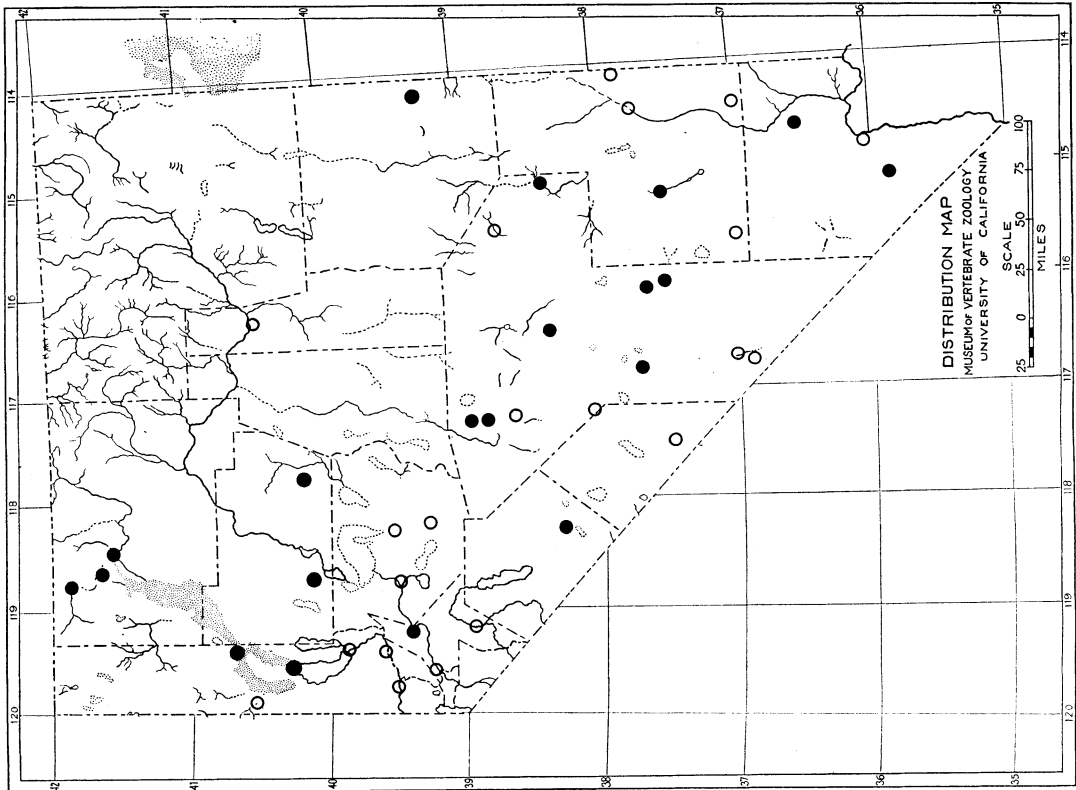


FIG. 8. Distribution of *Crotaphytus collaris baileyi* in Nevada.

Hiko Spring, 2,000 feet (Mus. Vert. Zool.); 5 miles southeast of Overton (Mus. Vert. Zool.).

In the Lahontan Basin, Richardson (1915, p. 408) found leopard lizards on the desert among low growths of sagebrush and other shrubs. Breeding activities were indicated as follows. Two females from Pyramid Lake Indian Agency, between May 26 and June 1, contained two and four eggs. One at Derby, June 29, had two eggs, and one at Carson City, July 10, had three. The last one had brilliant red-orange breeding colors. A female taken in Elko County on July 13 contained eggs and the first young one (129 mm. long) was found in this vicinity on August 14.

Merriam (in Stejneger, 1893, p. 168) has given a full account of special coloration of this species in the breeding season, as follows: "In many lizards, as well known, the male assumes a special coloration during the breeding season. The present species is a notable exception, the male remaining the same, while the female undergoes a remarkable change. The whole under surface and sides of the tail become deep salmon or even salmon red, and the sides of the body assume the same color, either uniformly or in blotches. The red markings on the sides usually begin as spots, which soon unite to form transverse stripes. The central part of the back is not affected by the change, and the dark markings on the sides remain distinct. None were seen in this condition until May 20, when the first red one was found on Pahroc Plain, Nev., but dozens were seen afterward in Pahranaagat Valley, Indian Spring Valley, the Amargosa Desert, Tule Cañon, and numerous other localities. The change does not take place till late in the development of the egg. Many pairs were observed in copulation in Diamond and the Upper Santa Clara Valleys, Utah, and thence northward to Mountain Meadows and the Escalante Desert, and westerly across the Juniper Mountains to Meadow Creek Valley from May 11 to 19, but no trace of the red coloration had appeared. The red individuals were always found to contain large eggs, generally measuring from 12 to 15 mm. in length, with the coriaceous shell already formed."

The leopard lizard in Nevada feeds mainly upon large insects, such as grasshoppers, and other lizards. The following kinds of lizards have been identified as items of food in this area: *Crotaphytus wislizenii*, *Uta stansburiana*, *Sceloporus graciosus*, *Sceloporus magister*, *Cnemidophorus tessellatus*, *Phrynosoma platyrhinos*.

Fitch (MS) made observations in 1932, in

southern Nevada, on this species as follows. On May 14, at 10:30 a. m., he found a mating pair in a road 14 miles southeast of Tonopah. Tracks in the dust showed where the female had dragged the male. They permitted persons to approach within a few feet without separating. Near Crystal Spring, Lincoln County, on May 19, another mating pair was found at 6 p. m. That morning at 5:30 o'clock, a leopard lizard was found sunning itself on a rock. The animal was dark in color and so sluggish that it was approached and caught by hand before it moved.

The leopard lizard proved to be one of the commonest reptiles of the desert in Humboldt County (Taylor, 1912, p. 347). It was found in washes and on lesser ridges of the open desert, under various species of desert plants and was much more common along the eastern foothills of the mountains than at any other locality visited. When really surprised the lizards exhibited great speed, never stopping until they reached some convenient bush, into the shelter of which they crawled and remained quiet. One escaped by running into a burrow. One was shot in the top of a low thorny bush. When handled certain individuals made a hissing sound and vigorously attempted to bite; one uttered a low moaning sound. While at rest they kept the head raised from the ground and watched an intruder, but when in motion they lowered it. One ran into a bush after a cicada which apparently it failed to secure. Next it crawled along slowly, occasionally protruding its tongue. When a fly buzzed about the bush and lit nearby the lizard crawled slowly toward it, and as the insect left the ground the lizard jumped four inches into the air after it. In the jump all four feet left the ground. The first female showing the red coloration of the breeding season was captured on June 8.

On June 7, 1932, in Garden Valley, Nye County, a leopard lizard was shot after it ran from a clump of grass late in the afternoon. It was muddy and dark colored, relatively sluggish, apparently having just come out after two days of cold and rainy weather.

Sauromalus obesus (Baird)

Chuckwalla

Original description.—*Euphryne obesus* Baird, Proc. Acad. Nat. Sci., vol. 12, 1858 [1859], p. 253 (Fort Yuma, Arizona).

Synonym for Nevada.—*Sauromalus ater*, Van Denburgh and Slevin (1921, p. 30).

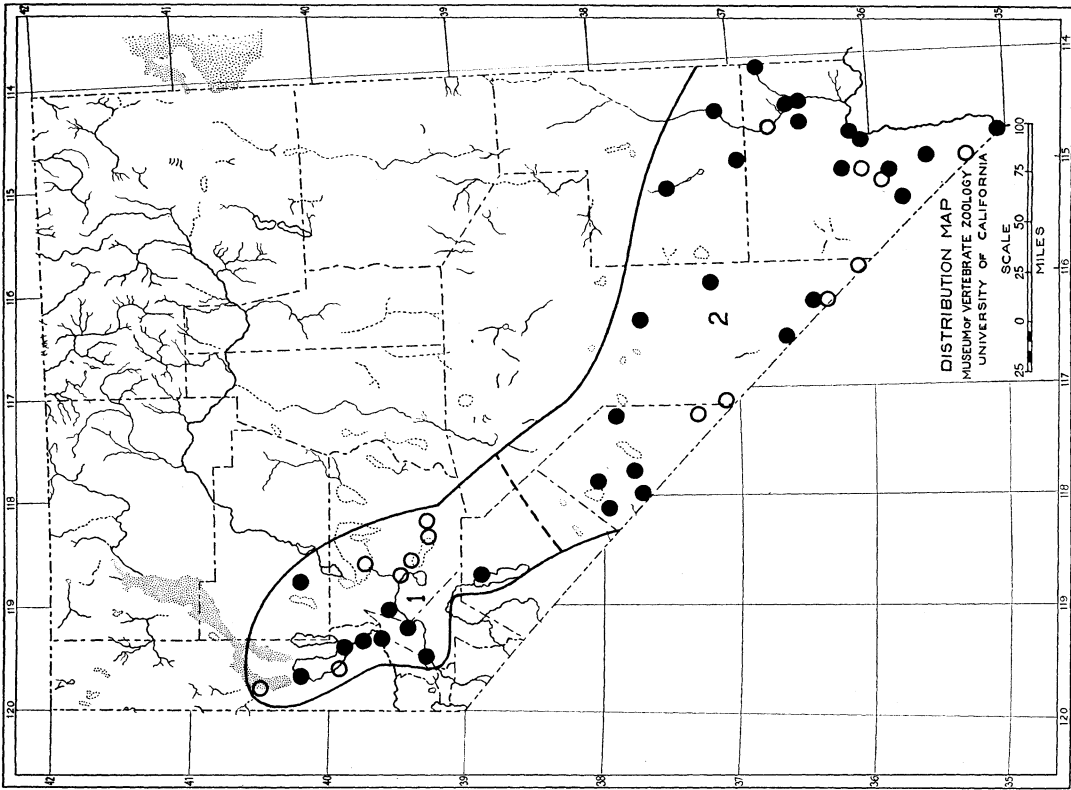


FIG. 11. Distribution of *Calisaurus draconoides* in Nevada (1, *C. d. myurus*; 2, *C. d. gabbi*).

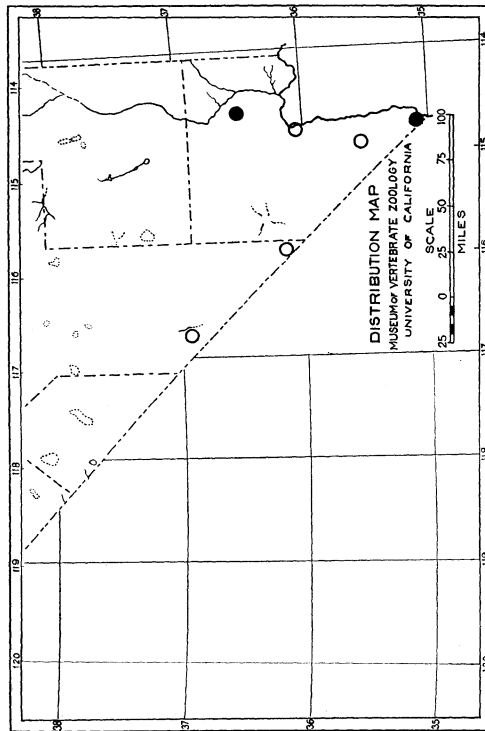


FIG. 10. Distribution of *Sauromalus obesus* in southern Nevada.

Range.—Southern Nevada, southwestern Utah, Arizona, southern California, and northern Lower California.

Occurrence in Nevada.—The chuckwalla has been captured at several localities in the southern part of the state, north to Rhyolite. They are all south of 37° N. and below 4,000 feet altitude. Rocky sections of the desert provide suitable habitat.

Nevada localities (Fig. 10) (6 specimens in Museum of Vertebrate Zoology).—

Nye County: Rhyolite (Calif. Acad. Sci.); Pah-rump Valley (U. S. N. M.).

Clark County: Atlatl Rock, 2,000 feet, Valley of Fire (Mus. Vert. Zool.); Searchlight (Klauber, 1932, p. 121); Hiko Spring (Mus. Vert. Zool.); 9½ miles south of Dead Mountain, 2,200 feet (Mus. Vert. Zool.); vicinity of Boulder Dam (Cowles and Bogert, 1936, p. 37).

***Callisaurus draconoides gabbii* Cope**

Gridiron-tailed Lizard

Original description.—*Callisaurus draconoides gabbii* Cope, Rept. U. S. Nat. Mus., 1898 [1900], p. 272 (northern Lower California).

Synonyms for Nevada.—*Callisaurus ventralis* (part), Van Denburgh, 1897, p. 50.

Callisaurus draconoides ventralis, Cope, 1900, p. 274.

Callisaurus ventralis ventralis, Van Denburgh and Slevin, 1921, p. 31.

Range.—Southern Nevada, western Arizona, southeastern California, and northern Lower California.

Occurrence in Nevada.—This race is one of the most abundant lizards on the sandy and gravelly ground in southern Nevada, north to about the 38th parallel. Records show its presence nearly across Esmeralda County and north to central Nye and Lincoln counties. It is found usually on the floors of the valleys and is especially abundant on areas of pure sand. A long period of collecting in northern Nye County and other localities failed to show the presence of this lizard on the high plateau of central and northern Nevada.

Nevada localities (Fig. 11) (311 specimens in Museum of Vertebrate Zoology).—

Esmeralda County: 7 miles north of Arlemont (Mus. Vert. Zool.); Big Smoky Valley (Mus. Vert. Zool.); Fish Lake (Mus. Vert. Zool.); 2 miles northwest of Cave Spring, 5,700 feet (Mus. Vert. Zool.); Gold Mountain (Stejneger, 1893,

p. 172); 15 miles south of Tonapah (Mus. Vert. Zool.).

Nye County: Amargosa Desert, 20 miles southeast of Beatty (Mus. Vert. Zool.); Amargosa Desert, Thorps Mill (U. S. N. M.); 3 miles northeast and 2 miles southeast of Fairbanks Spring (Mus. Vert. Zool.); Ash Meadows (U. S. N. M.); Pah-rump Valley (U. S. N. M.); 4½ miles southeast of Oak Springs, 4,750 feet (Mus. Vert. Zool.); south end of Kawich Range (Mus. Vert. Zool.).

Lincoln County: Crystal Spring (Mus. Vert. Zool.); 11 miles south of Hiko (Mus. Vert. Zool.); Ash Spring, 3,800 feet (Mus. Vert. Zool.); Pahranagat Valley (U. S. N. M.); 6 miles northeast of Carp, 3,000 feet (Mus. Vert. Zool.); 1 mile west of Coyote Spring, 2,500 feet (Mus. Vert. Zool.).

Clark County: 2 and 5 miles southeast of Overton, 1,300 feet (Mus. Vert. Zool.); 8 miles south of Saint Thomas (Mus. Vert. Zool.); Glendale (Klauber, 1932, p. 121); Sloan (*ibid.*); Boulder City (*ibid.*); Las Vegas Wash, 11 and 16 miles southeast of Las Vegas (*ibid.*); Piute Valley, 10 miles south of Searchlight and 1 mile north of California line (*ibid.*); 10 miles northeast of Las Vegas (Mus. Vert. Zool.); Colorado River, 3 and 12 miles above Boulder Dam (Mus. Vert. Zool.); Callville (U. S. N. M.); 19 miles south of Las Vegas (Mus. Vert. Zool.); opposite Fort Mojave (Mus. Vert. Zool.); 1 mile west of Jean (Mus. Vert. Zool.); Hiko Spring, 2,000 feet (Mus. Vert. Zool.); 5 and 12 to 20 miles north of Searchlight, 3,500 feet (Mus. Vert. Zool.); Indian Spring, 4,000 feet, Virgin Mountains (Mus. Vert. Zool.); 3 miles south of Mesquite, 2,500 feet (Mus. Vert. Zool.); Atlatl Rock, 2,000 feet, Valley of Fire (Mus. Vert. Zool.).

The race *gabbii* was characterized and compared with *draconoides* in the original description by Cope (1900, p. 272) as follows: "A band of granular scales behind collar only. Superciliary scales equal frontals and in contact on middle line; larger scales before ear; legs longer; wrist beyond muzzle, hind foot mostly so."

Callisaurus draconoides gabbii exhibits characters as follows: Males have two large oblique lateral black blotches usually not followed by a third black spot; dark dorsal tail bars with nearly straight or slightly undulate posterior margins at least from middle to end of tail; dorsal tail bars black in males; occipital and supraorbital semicircles usually separated by a row of scales (re-

verse of condition in *C. d. ventralis*); ratio of tail length to total length greater than in *C. d. ventralis*; ratio of length of hind leg to body length greater than in *C. d. ventralis*; femoral pores average less than 17 (17 or more is average in *C. d. ventralis*).

Merriam (in Stejneger, 1893, p. 171) gave an extended account of the habits of this lizard in southern Nevada where he considered it the most characteristic reptile of the deserts. He found it almost universally distributed there and much more abundant than any other species. He wrote that "it starts off at full speed, as if fired from a cannon, and stops with equal suddenness, thus escaping or eluding its enemies, the coyotes, hawks, and larger lizards. When running it moves so swiftly that the eye has difficulty in following, and when at rest its colors harmonize so well with those of the desert that it can hardly be seen."

"The attitude of this lizard when at rest differs from that of most others in that the knees and elbows stand out at right angles from the body and are elevated to such a degree that they nearly reach the plane of the back. Like many other species, it has an odd habit of performing a singular gymnastic exercise, consisting in rapidly dropping and elevating the body with the knees held stiff at right angles to the trunk."

The same observer found the food of this lizard to be insects and the blossoms and leaves of plants. He noted that during the breeding season the males develop a conspicuous patch of metallic greenish-blue on the sides of the body and have the power of inflating a pinkish sac under the chin.

Geographic variation in Nevada was observed by Merriam (*op. cit.*, p. 172), as follows. "In Desert Valley, just east of the Pahroc Mountains, a form of this species was found which seems to be subspecifically distinct from the ordinary type. It is much shorter and broader, with a shorter tail, and is bluish-gray in color. It may be the same as the animal inhabiting the desert at Pyramid Lake, Nevada, which point is about two degrees further north than Desert Valley, though in the same zoological sub-zone, for the low altitude of a series of narrow and irregular deserts in western Nevada carries this zone much farther north than elsewhere. These specimens suggest the existence of a form peculiar to the upper division (or *Grayia* belt) of the Lower Sonoran Zone, *Callisaurus ventralis* [= *gabbii*] proper being closely restricted to the lower division (or *Larrea* belt) of the same zone."

Callisaurus draconoides myurus Richardson

Gridiron-tailed Lizard

Original description.—*Callisaurus ventralis myurus* Richardson, Proc. U. S. Nat. Mus., vol. 48, 1915, p. 408 (Pyramid Lake Indian Agency, Washoe County, Nevada).

Synonyms for Nevada.—*Callisaurus ventralis* (part), Van Denburgh, 1897, p. 50.

Callisaurus draconoides ventralis, Burt, 1933, p. 230.

Range.—Western Nevada.

Occurrence in Nevada.—This race is most abundant in the vicinity of Pyramid Lake, but it has been found at other localities in southern Washoe County, Lyon County, western Pershing and Churchill counties, and northern Mineral County. Its range may not be so sharply cut off from the rest of the species as the records shown on the map indicate. However, some collecting has been done in the intervening area.

Nevada localities (Fig. 11) (87 specimens in Museum of Vertebrate Zoology).—

Washoe County: North end Pyramid Lake (Mus. Vert. Zool.); The Needles (Mus. Vert. Zool.); The Willows (U. S. N. M.); near Sutcliffe (Calif. Acad. Sci.); Pyramid Lake Indian Agency (Mus. Vert. Zool.; U. S. N. M.); Truckee River, 12 miles northwest of Wadsworth (Mus. Vert. Zool.); Big Bend of Truckee River (U. S. N. M.); Wadsworth (Mus. Vert. Zool.; U. S. N. M.); Derby (U. S. N. M.); Smoke Creek Desert (U. S. N. M.).

Lyon County: 27, 23, 20, and 18 miles west of Fallon, 4,300 feet (Mus. Vert. Zool.); 6½ miles east of Dayton (Mus. Vert. Zool.).

Pershing County: 16 miles west of Lovelock (Mus. Vert. Zool.).

Churchill County: 3 miles west of Hazen (Mus. Vert. Zool.); Fallon (U. S. N. M.); Carson Sink (U. S. N. M.); near Sand Springs (Univ. Mich.; U. S. N. M.); 1 mile southeast of Salt Wells and 3 miles west of Frenchman's Station (Burt, 1933, p. 232).

Mineral County: 6 and 8 miles south of Schurz (Mus. Vert. Zool.).

Callisaurus d. myurus, the northernmost race in the species, reaches an extreme in several directions of development. It has a shorter tail, fewer femoral pores, and darker dorsal coloration compared with races immediately to the south.

All Nevada specimens of this species were measured, but the summary shown in the accom-

panying tabulation applies to only eighty or about one fifth of the individuals. Twenty of the largest ones were selected and measured from each of four localities.

Locality		Body-length	Tail-length	Ratio of Body-length to Tail-length	Length of Hind leg	Femoral pores
Virgin River near Overton.....	{ Av.	77.3	105.1	.73	73.2	16.14
	{ Min.	73.0	99.8		69.0	14
	{ Max.	84.1	116.2		79.1	19
Colorado River near Fort Mojave...	{ Av.	77.6	103.0	.75	73.8	16.56
	{ Min.	69.9	94.0		65.5	14
	{ Max.	87.5	118.5		81.0	20
Amargosa Desert.....	{ Av.	75.75	98.8	.77 —	73.2	16.09
	{ Min.	68.2	81.2		65.5	13
	{ Max.	81.6	116.5		79.5	19
Pyramid Lake.....	{ Av.	76.7	94.9	.80	70.8	13.59
	{ Min.	74.5	87.5		63.4	11
	{ Max.	81.0	103.9		78.2	16

In the region of Pyramid Lake this is the most abundant reptile over most of the area. Richardson (1915, p. 411) observed that it occurred in greatest numbers on the sandy desert among low shrubs. He saw none in dense growths of sagebrush or on rocky hillsides. He noted that it was swift, often running a hundred feet or more when disturbed, and that it seldom ran straight ahead of an intruder, but usually moved off to the right or left in an arc. When in rapid motion, the tail was raised above the level of the body, but never curled over the back. The tail was curled over the back sometimes when a lizard was moving slowly. During a light thundershower many of the lizards were found buried in loose desert sand, where they remained until nearly stepped on before moving. A wounded individual uttered a high-pitched cry when handled. Seven stomachs contained wasps, grasshoppers, spiders, larvae of insects, and vegetable material. Three females taken on May 31 at the south end of Pyramid Lake contained 4, 5, and 6 large eggs each.

As Richardson (1915, p. 411) has already pointed out the *Holbrookia* reported from "north of Pyramid Lake" by Cope (1883, p. 18) was no doubt this form.

***Uta graciosa* (Hallowell)**

Long-tailed Uta

Original description.—*Uro-saurus graciosus* Hallowell, Proc. Acad. Nat. Sci. Phila., vol. 7, 1854, pp. 92–93 ("Lower California" [= southern California]).

Range.—Southern California, southern Nevada, southwestern Arizona, and northeastern Lower California.

Occurrence in Nevada.—All records are from

localities in southern and eastern Clark County, mostly in the vicinity of the Virgin and Colorado rivers. Cowles and Bogert (1936, p. 37) found this lizard especially common in the creosote bushes bordering a stream near Boulder City.

Nevada localities (Fig. 13) (21 specimens in Museum of Vertebrate Zoology).—

Clark County: Bunkerville (U. S. N. M.); Mesquite (San Diego Soc. Nat. Hist.); 2 miles southeast of Overton, 1,300 feet (Mus. Vert. Zool.); Kaolin, 1,220 feet (Mus. Vert. Zool.); Callville (U. S. N. M.); Colorado River, 25 miles above Boulder Dam (Mus. Vert. Zool.); Boulder City (Cowles and Bogert, 1936, p. 37); 10 miles northeast of Las Vegas, 2,000 feet (Mus. Vert. Zool.); Atlatl Rock, 2,000 feet, Valley of Fire (Mus. Vert. Zool.).

***Uta ornata symmetrica* Baird**

Tree Uta

Original description.—*Uta symmetrica* Baird, Proc. Acad. Nat. Sci. Phila., 1858, p. 253 (Fort Yuma, Arizona).

Synonym for Nevada.—*Uta ornata ornata*, Stejneger and Barbour, 1933, p. 57.

Range.—Valley of the Colorado River and the adjacent Colorado Desert.

Occurrence in Nevada.—Definite localities are all along the Colorado River on the southern border of the state. Cowles and Bogert (1936, p. 38) report this species as confined almost entirely to the steepest cañon walls. Yarrow (1883, p. 56)

reported a specimen (no. 8641, U. S. N. M.) collected by himself in 1872, in Nevada, but no definite locality specified. Van Denburgh and Slevin (1921, p. 28) queried this species in their list of amphibians and reptiles of Nevada.

Nevada localities (No specimens in Museum of Vertebrate Zoology).—

Clark County: Black Cañon (Cowles and Bogert, 1936, p. 38); Eldorado Cañon (Cowles and Bogert, 1936, p. 38).

Uta stansburiana stansburiana

Baird and Girard

Brown-shouldered Lizard

Original description.—*Uta Stansburiana* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, p. 69 (Salt Lake Valley, Utah). Stansbury's Expl. Surv. Vall. Great Salt Lake, 1852, p. 345, pl. 5, figs. 4–6.

Synonyms for Nevada.—*Uta stansburiana*, Yarrow, 1883, p. 56.

Uta stansburiana nevadensis, Ruthven and Gaige, 1915, p. 18.

Range.—Eastern Oregon, southern Idaho, northern California and Nevada, and most of Utah.

Occurrence in Nevada.—Record stations are nearly all in the northwestern part of the state, north of Fish Lake Valley, Esmeralda County. This lizard is usually confined to the near vicinity of rocks or bushes where it can reach cover quickly when disturbed.

Nevada localities (Fig. 12) (135 specimens in Museum of Vertebrate Zoology).—

Washoe County: Smoke Creek, 1 mile from California line (Mus. Vert. Zool.); Pyramid (Calif. Acad. Sci.); Sutcliffe (Calif. Acad. Sci.; U. S. N. M.); Anaho Island (Calif. Acad. Sci.); Derby (Stan. Univ.); Little High Rock Cañon (Mus. Vert. Zool.); Truckee River, 12 miles northwest of Wadsworth (Mus. Vert. Zool.); Big Bend of Truckee River (U. S. N. M.); east of Reno (U. S. N. M.).

Storey County: Virginia City.

Lyon County: Mason Valley, 12 miles east of Wellington (Mus. Vert. Zool.); Lincoln Highway, 22 and 29 miles west of Fallon (Mus. Vert. Zool.); West Walker River, 12 miles south of Yerington (Mus. Vert. Zool.).

Humboldt County: Virgin Valley (Mus. Vert. Zool.); Big Creek Ranch (Mus. Vert. Zool.);

Alder Creek (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.).

Elko County: Cortez Range, near Carlin (Univ. Mich.); Moleen Cañon (Univ. Mich.); Piñon Cañon (Univ. Mich.); 8 miles southwest of Wendover, Utah, 4,700 feet (Mus. Vert. Zool.).

Pershing County: 2 miles west of Toulon (Mus. Vert. Zool.); 15 miles west of Lovelock, 5,100 feet (Mus. Vert. Zool.); south base Granite Peak, East Range (Mus. Vert. Zool.).

Churchill County: Hazen (Univ. Mich.); 5 miles north of Fallon (Mus. Vert. Zool.); 2 miles east of Sand Spring (U. S. N. M.); 7 miles east of Frenchman's Station (U. S. N. M.).

Lander County: Smoky Valley, between Birch and Kingston creeks (Mus. Vert. Zool.); Clear Creek, 6,500 feet (Mus. Vert. Zool.).

Eureka County: 12 miles south of Eureka (Mus. Vert. Zool.).

White Pine County: 8 miles west of Illipah (Burt, 1933, p. 236); Mt. Moriah near Smith Creek Cave (Mus. Vert. Zool.).

Mineral County: East Walker River, 2 miles northwest of Morgan's Ranch (Mus. Vert. Zool.); 7 miles north of Schurz, 4,600 feet (Mus. Vert. Zool.); Endowment Mine (Mus. Vert. Zool.); Huntoon Valley, 6,700 feet (Mus. Vert. Zool.).

Esmeralda County: 7 miles north of Arlemont (Mus. Vert. Zool.); Arlemont (Mus. Vert. Zool.); Fish Lake (Mus. Vert. Zool.).

Nye County: Wisconsin Creek, 6,000 feet (Mus. Vert. Zool.); Ophir Creek, 6,500 feet (Mus. Vert. Zool.); Last Chance Creek, 6,000 feet (Mus. Vert. Zool.); South Twin River, 6,500 feet (Mus. Vert. Zool.); Pablo Creek, 6,400 feet (U. S. N. M.); Smoky Valley, 5 miles southeast of Millett P. O. (Mus. Vert. Zool.); Round Mountain (U. S. N. M.); Tonopah (Calif. Acad. Sci.).

Richardson (1915, p. 412) on the basis mainly of specimens from western Nevada, characterized *Uta s. stansburiana* as having "small, rounded, and weakly carinated dorsal scales. The number of scales in a line from the interparietal plate to a point on the rump above the posterior surfaces of the thighs varies between 89 and 116. The average for 55 specimens is 103.4. Six males have a tail length ranging from 70 mm. to 77 mm., average 74+ mm. In five females the minimum length is 66 mm., the maximum 69 mm., and the average 67+ mm. The femoral pores likewise are fewer in number (average 13+) than in the

other forms (= *stejnegeri* and *hesperis*).” That author considered *nevadensis* to be identical with *stansburiana*.

***Uta stansburiana stejnegeri* Schmidt**

Brown-shouldered Lizard

Original description.—*Uta stansburiana stejnegeri*, Schmidt, Amer. Mus. Nov., no. 15, 1921, pp. 1–2 (Mouth of Dry Cañon, Alamogordo, Otero County, New Mexico).

Synonyms for Nevada.—*Uta stansburiana*, Stejneger, 1893, p. 175.

Uta stansburiana stansburiana, Cowles and Bogert, 1936, p. 38.

Range.—Southeastern California and southern Nevada east to western Texas and south to northeastern Lower California and northern Mexico.

Occurrence in Nevada.—Southern part of the state is occupied by this race which extends north along the eastern border as far as the 39th parallel and northwest as far as Tonopah. The northern boundary of the range has been drawn on the map somewhat arbitrarily, but it agrees fairly well with the treatment given this species by Van Denburgh (1922). The population in the southern end of the state is generally distributed throughout the deserts and the mountains.

Nevada localities (Fig. 12) (140 specimens in Museum of Vertebrate Zoology).—

White Pine County: Baker (Mus. Vert. Zool.); 4 miles northeast of Baker (Univ. Mich.); 4 miles northwest of Baker (U. S. N. M.).

Esmeralda County: Goldfield (Calif. Acad. Sci.).

Nye County: Rhyolite (Calif. Acad. Sci.); south end Kawich Mountains (Mus. Vert. Zool.); 2 miles southeast of Fairbanks Spring (Mus. Vert. Zool.); Amargosa River, 3½ miles northeast of Beatty (Mus. Vert. Zool.); 2 miles northwest of Indian Spring, Belted Range (Mus. Vert. Zool.); 8 miles west of Tybo, 6,700 feet, Hot Creek Range (Mus. Vert. Zool.); 4 miles north of Hot Creek, Hot Creek Range (Mus. Vert. Zool.); Railroad Valley, 3 miles south of Nyala, 5,600 feet (Mus. Vert. Zool.); 7½ to 9 miles east of Cliff Spring, 6,000 feet (Mus. Vert. Zool.); Garden Valley, 8½ miles northeast of Sharp (Mus. Vert. Zool.); Ash Meadows (U. S. N. M.); Pahump Valley (U. S. N. M.).

Lincoln County: Penoyer Valley, 9 miles southeast of Belted Peak (Mus. Vert. Zool.); 16 miles east of Groom Baldy, 4,600 feet (Mus.

Vert. Zool.); Crystal Spring, and 1 mile northeast (Mus. Vert. Zool.); Ash Spring (Mus. Vert. Zool.); Pahrnagat Valley (U. S. N. M.); Caliente (U. S. N. M.); 21 miles south of Caliente (Mus. Vert. Zool.); 1 mile west of Coyote Spring, 2,500 feet (Mus. Vert. Zool.); 6 miles northeast of Carp (Mus. Vert. Zool.).

Clark County: Mountain Spring, 5,600 feet, Charleston Mountains (U. S. N. M.); Kyle Cañon, 6,000 feet, Charleston Mountains (Mus. Vert. Zool.); Kyle Cañon, 4,000 feet, Charleston Mountains (Cowles and Bogert, 1936, p. 38); Atlatl Rock, 2,000 feet, Valley of Fire (Mus. Vert. Zool.); Virgin River (U. S. N. M.); 2 and 5 miles southeast of Overton, 1,300 feet (Mus. Vert. Zool.); Saint Thomas (U. S. N. M.); Mesquite (San Diego Soc. Nat. Hist.); 3 miles south of Mesquite, 2,500 feet (Mus. Vert. Zool.); Indian Spring, 4,000 feet, Virgin Mountains (Mus. Vert. Zool.); Glendale (Klauber coll.); 3 miles northwest and 10 miles northeast of Las Vegas (Mus. Vert. Zool.); Las Vegas (Klauber coll.); Vegas Valley (U. S. N. M.); 19 miles south of Las Vegas (Mus. Vert. Zool.); 6 miles north of Searchlight (Mus. Vert. Zool.); 14 miles northeast of Searchlight (Mus. Vert. Zool.); Searchlight (Klauber, 1932, p. 122); Jean (Klauber, 1932, p. 122); 1 mile west of Jean (Mus. Vert. Zool.); Piute Valley, 1 mile north of California line (Klauber, 1932, p. 122); Colorado River, 25 miles above Boulder Dam (Mus. Vert. Zool.); vicinity of Boulder City (Cowles and Bogert, 1936, p. 38); Hiko Spring, 2,000 feet (Mus. Vert. Zool.); 2 miles northwest of Fort Mojave, 500 feet (Mus. Vert. Zool.).

The form of *Uta* which inhabits southern Nevada was described by Richardson (1915, p. 415) as follows: “Like *Uta stansburiana* Baird and Girard, but with larger and more heavily carinated and acutely pointed dorsal scales. The number of scales in a line from the interparietal plate on the head to a point on the back above the posterior surfaces of the thighs varies in 111 specimens from 78 to 103; average, 86.5. The general size is larger than that of *Uta stansburiana*, especially in the ratio of the hind leg to the length from snout to anus and in the tail length. The tail length in 6 males from the Colorado River, Arizona and California, ranges from 92.5 mm. to 104.5 mm.; average, 98.3 mm. In 8 females from the same region the minimum length is 71.5 mm., the maximum 81.5 mm., the average 76.2 mm., longer than in any typical *Uta stansburiana* ex-

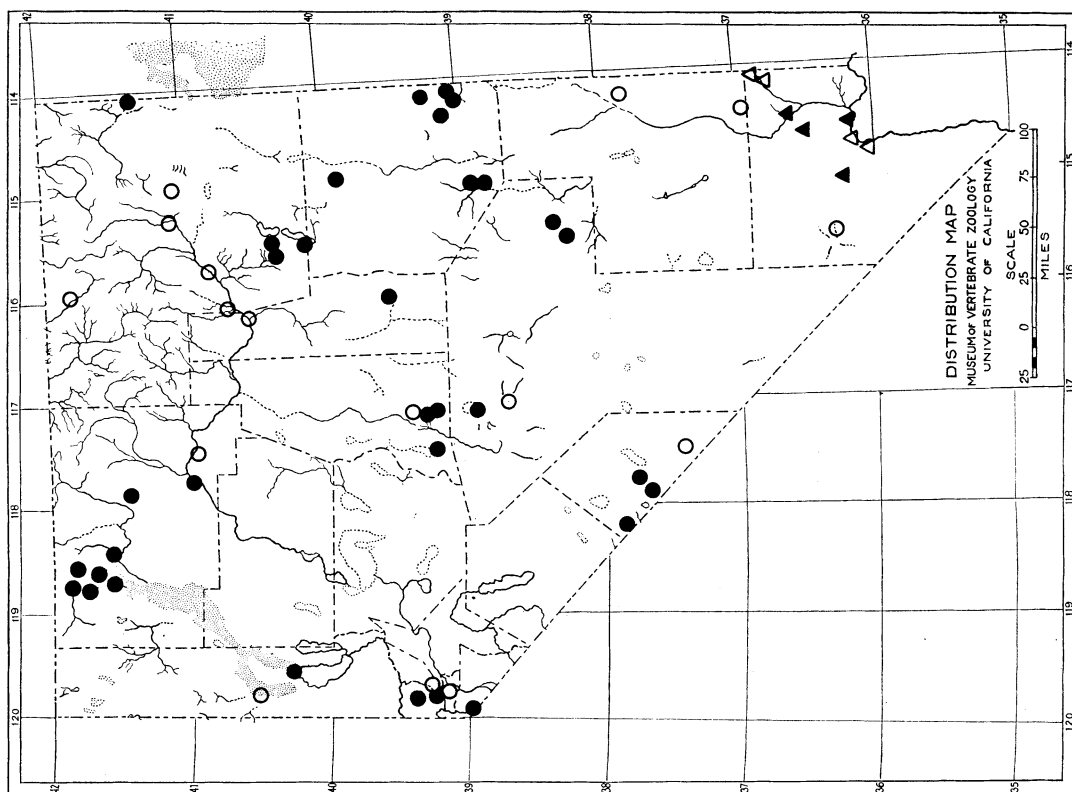


FIG. 13. Distribution of *Sceloporus graciosus* (circles) and *Uta graciola* (triangles) in Nevada.

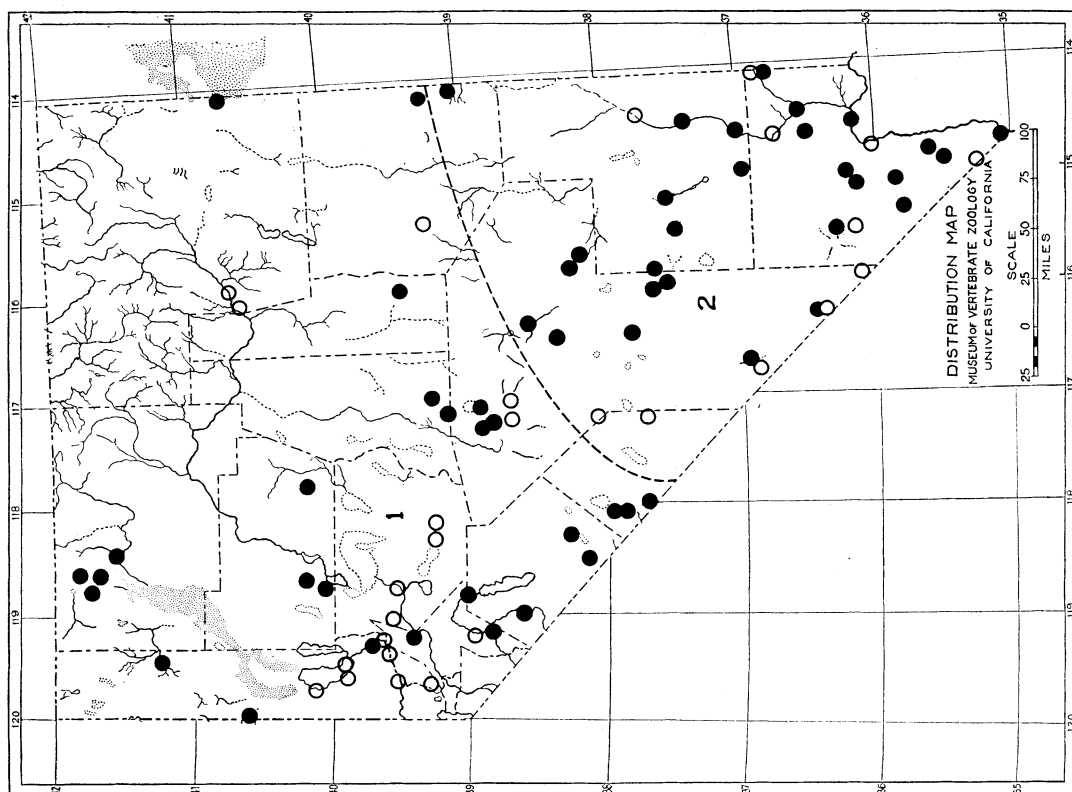


FIG. 12. Distribution of *Uta stansburiana* in Nevada (1, *U. s. stansburiana*; 2, *U. s. stansburiana*).

amed. The femoral pores average 14+ on each thigh, a larger average number than is possessed by *Uta stansburiana*."

Sceloporus graciosus graciosus

Baird and Girard

Sagebrush Lizard

Original description.—*Sceloporus graciosus* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, p. 69 (Valley of Great Salt Lake, Utah).

Synonyms for Nevada.—*Sceloporus gracilis*, Yarrow, 1875, p. 576.

Sceloporus graciosus, Yarrow, 1875, p. 576.

Sceloporus consobrinus, Yarrow, 1883, p. 61.

Sceloporus graciosus, Ruthven and Gaige, 1915, p. 21.

Sceloporus graciosus gracilis, Van Denburgh, 1922, p. 285.

Range.—Eastern Oregon and Nevada east to Wyoming and Colorado and south to northeastern Arizona and western Oklahoma.

Occurrence in Nevada.—This race occupies most of the state above the 4,500-foot level, except the extreme southern part. It has been taken as far south as the Charleston Mountains in Clark County. Over most of the state it occupies the valleys and flats between 5,000 and 6,500 feet; some places occurring as high as 8,000 feet. Most frequently it is found among stands of *Artemisia tridentata*. In general the habitat of this species in Nevada seems to be below that of the larger *S. occidentalis*. This is just the reverse of the condition in California, where the large species is more frequent in the valleys and low ground and the small one is restricted to the mountains.

Nevada localities (Fig. 13) (101 specimens in Museum of Vertebrate Zoology).—

Washoe County: Smoke Creek Desert (U. S. N. M.); Horse Cañon, Pahrump Peak (Mus. Vert. Zool.); Fox Cañon, 6 miles south of Pahrump Peak (Mus. Vert. Zool.); 2 miles west of Reno Hot Springs (Mus. Vert. Zool.); east side of Washoe Lake (Mus. Vert. Zool.).

Storey County: Virginia City (Van Denburgh, 1922, p. 285).

Ormsby County: Carson City (U. S. N. M.).

Douglas County: 3 miles southeast of Lake Tahoe (Mus. Vert. Zool.).

Humboldt County: Virgin Valley (Mus. Vert. Zool.); Thousand Creek (Mus. Vert. Zool.);

Alder Creek, 5,000 and 6,000 feet (Mus. Vert. Zool.); Big Creek, 4,800 to 6,000 feet (Mus. Vert. Zool.); Big Creek Ranch (Mus. Vert. Zool.); Leonard Creek, 5,000 to 6,000 feet (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.); Amos (Mus. Vert. Zool.); Winemucca (Mus. Vert. Zool.); Golconda (U. S. N. M.).

Elko County: Mountain City (U. S. N. M.); Tecoma, 4,900 feet (Mus. Vert. Zool.); Wells (Calif. Acad. Sci.); Elko (Calif. Acad. Sci.; U. S. N. M.); Carlin (Calif. Acad. Sci.; U. S. N. M.); Deeth (U. S. N. M.); Harrison Pass R. S. (Mus. Vert. Zool.); Green Mountain Cañon, Ruby Mountains (Mus. Vert. Zool.); west side of Ruby Lake, 3 miles north of Elko County line (Mus. Vert. Zool.).

Lander County: Austin (Calif. Acad. Sci.); Big Creek Camp Ground (Mus. Vert. Zool.); Mahogany Cañon (Mus. Vert. Zool.); Kingston R. S. (Mus. Vert. Zool.); Peterson Creek, 6,500 feet, Shoshone Mountains (Mus. Vert. Zool.).

Eureka County: Cortez Mountains (Univ. Mich.); Palisade (Stan. Univ.); 8 miles west of Eureka (Mus. Vert. Zool.).

White Pine County: Antelope Springs (Van Denburgh, 1922, p. 278); Sacramento Pass, 10 miles from Osceola (Univ. Mich.); Cherry Creek, 6,800 feet (Mus. Vert. Zool.); Spring Valley, 6,000 feet, 5½ miles southwest of Osceola (Mus. Vert. Zool.); Deadman Creek and Smith Creek Cave, Mt. Moriah (Mus. Vert. Zool.); Lehman Cave (Mus. Vert. Zool.); Baker Creek, 6,600 to 7,500 feet (Mus. Vert. Zool.); Baker, 5,800 feet (Mus. Vert. Zool.); Water Cañon, 8 and 10 miles north of Lund (Mus. Vert. Zool.); White River Valley, 1 mile south of Lund (Mus. Vert. Zool.).

Esmeralda County: Chiatovich Creek, 7,000 and 8,200 feet (Mus. Vert. Zool.); Valcalda Spring (Mus. Vert. Zool.); 2 miles south of Piper Peak, 7,700 feet, Silver Peak Range (Mus. Vert. Zool.); Mount Magruder, 8,000 feet (U. S. N. M.).

Nye County: Smoky Valley, 5 miles southeast of Millett P. O. (Mus. Vert. Zool.); Round Mountain (Calif. Acad. Sci.); Scofield Cañon, Grant Mountain (Mus. Vert. Zool.); Burned Corral Cañon, 6,700 feet, Quinn Cañon Mountains (Mus. Vert. Zool.).

Lincoln County: 15 miles east of Panaca (U. S. N. M.); Mormon Mountains (U. S. N. M.).

Clark County: Kyle Cañon, 5,000 to 8,000 feet,

Charleston Mountains (Cowles and Bogert, 1936, p. 38).

As was pointed out by Van Denburgh (1922, p. 276) the Nevada population of this species is intermediate in most characters between the races *graciosus* and *gracilis*. Typical examples of the former, from Utah, have larger dorsal scales and brighter coloration with dorsal and lateral blotches more distinct as compared with *gracilis* from Oregon and western California. Because the Nevada specimens seem to be nearer to *graciosus*, especially in coloration, all of them have been assigned here to that race. More material from the western border of the state might make it desirable to assign some specimens from there to the race *gracilis*.

The summary of measurements and scale counts tabulated below shows some structural characters of the Nevada population.

	Length snout to anus	Length of tail	Length hind leg	Femoral pores	Scales from interparietal to posterior surface of thigh
36 males (measurements in mm.)					
Av.....	54.31	75.85	38.27	14.56	52.71
Min.....	48.4	62.2	32.7	12	44
Max.....	62.4	95.0	44.4	19	61
48 females					
Av.....	54.94	72.35	37.29	14.20	53.66
Min.....	45.7	59.9	29.4	10	44
Max.....	64.1	88.3	42.0	18	61

In Elko County, Ruthven and Gaige (1915, p. 22) found this to be the most common and widely distributed lizard. It was found at altitudes between 5,000 and 7,500 feet, but most commonly at the lower levels. It was observed among rocks rarely, and then only where there was much soil, for it was found to be pre-eminently a ground form preferring a fine soil. They generally found this lizard beneath sage and other bushes where the coloration was protective. It climbed among the bushes to some extent, but when alarmed generally sought safety under dead brush or in a burrow. At night it buried itself in the loose soil. Females taken on July 4 contained large eggs; those taken on and after July 10 had none.

Females containing eggs were reported from the region of the Pine Forest Mountains, by Taylor (1912, p. 350) as collected on May 21, June 18, and June 25.

In Water Cañon, 8 miles north of Lund, White Pine County, on June 14, 1932, Boyers (MS)

made observations on fighting of two individuals of this species. The two lizards darted off a small rock under a sage bush and rolled about six inches down the slope, hanging on to each other with their teeth. They separated and stalked around each other, with throat puffed out, belly lowered, and tail straight out behind, every few seconds displaying by raising and lowering the body by flexing all four legs at once. After a minute, one moved off down slope and left the other.

Sceloporus magister magister Hallowell
Rough-scaled Lizard

Original description.—*Sceloporus magister* Hallowell, Proc. Acad. Nat. Sci. Phila., vol. 7, 1854, p. 93 (near Fort Yuma, California).

Synonyms for Nevada.—*Sceloporus clarkii*, Yarrow and Henshaw, 1878, p. 1645.

Sceloporus clarki clarki, Yarrow, 1883, p. 63.

Sceloporus magister, Richardson, 1915, p. 418.

Range.—From western Nevada south to northern Lower California and from southern California to southern Utah.

Occurrence in Nevada.—The rough-scaled lizard is common in the southern and western parts of the state, below the 4,000-foot level. In the west it extends northward as far as Pyramid Lake, in the east as far as Caliente. Usually lives where there are trees and bushes among which it climbs.

Nevada localities (Fig. 14) (73 specimens in Museum of Vertebrate Zoology).—

Washoe County: North end of Pyramid Lake (Calif. Acad. Sci.; U. S. N. M.); near The Needles (Mus. Vert. Zool.); Sutcliffe (Calif. Acad. Sci.); The Willows (U. S. N. M.); Anaho Island (Calif. Acad. Sci.); Wadsworth (U. S. N. M.); Derby (Van Denburgh, 1922, p. 335).

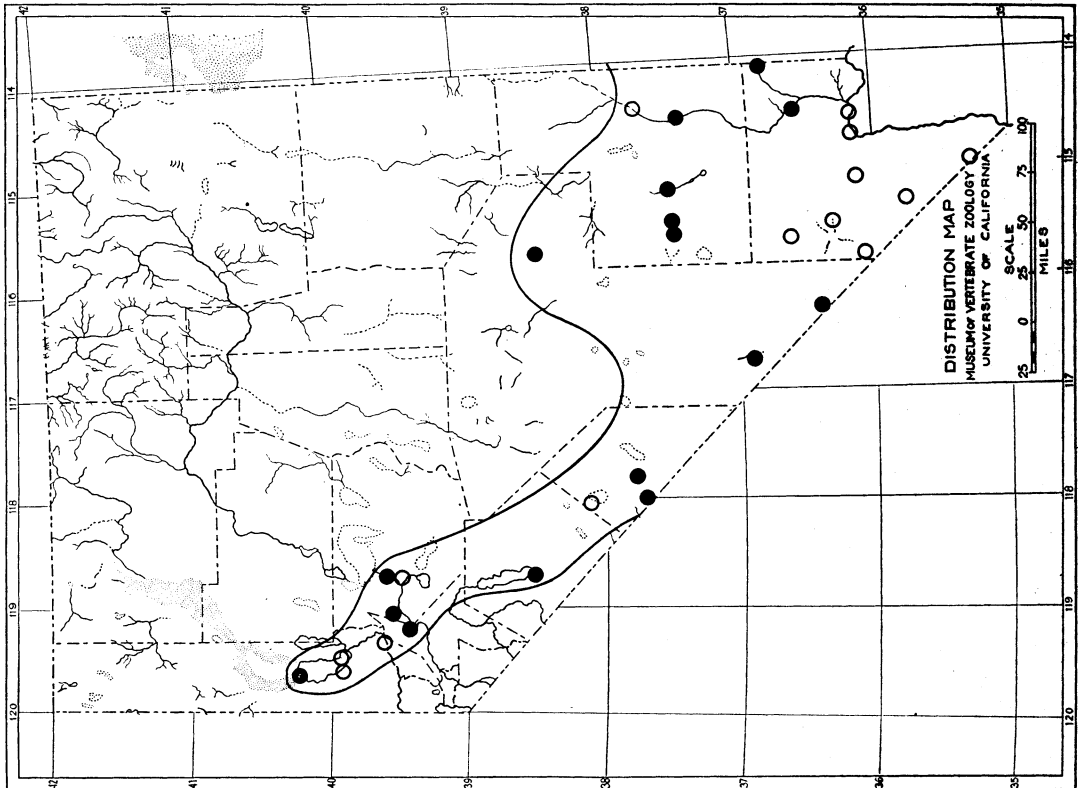


FIG. 14. Distribution of *Sceloporus magister magister* in Nevada.

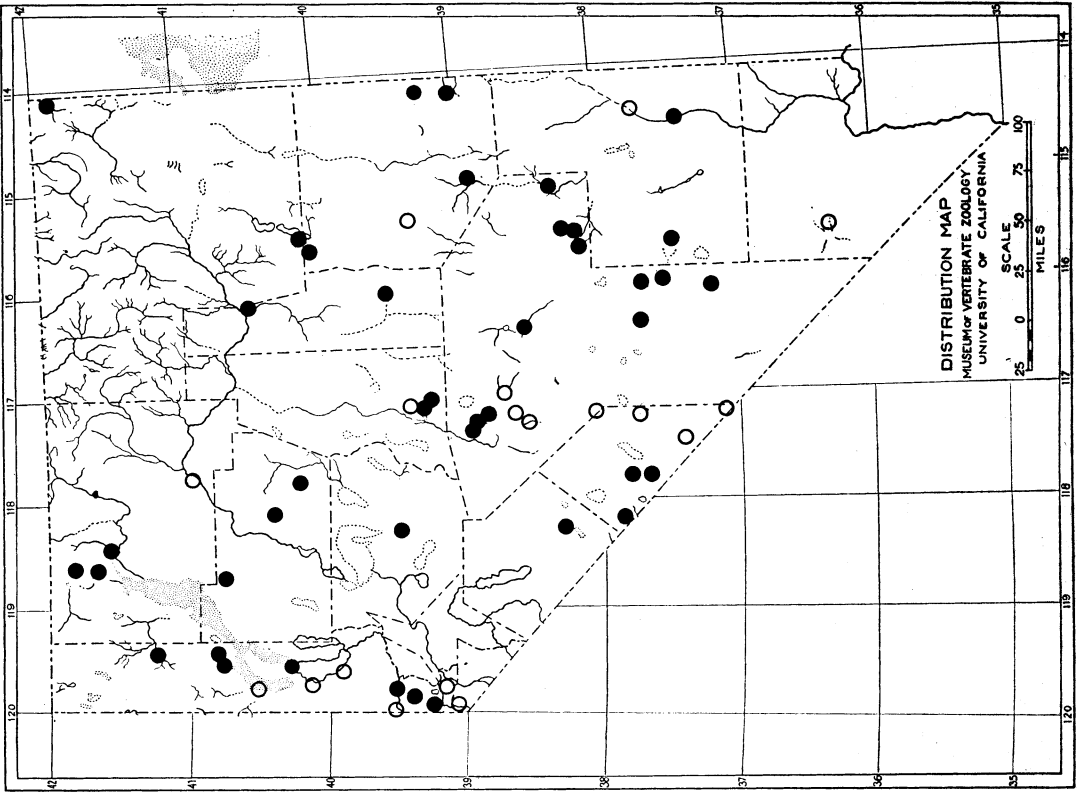


FIG. 15. Distribution of *Sceloporus occidentalis bi-seriatus* in Nevada.

Lyon County: Lincoln Highway, 22 miles west of Fallon (Mus. Vert. Zool.).

Churchill County: Hazen (Burt and Burt, 1929, p. 451); 6 miles west of Hazen (Mus. Vert. Zool.); 10 miles west and 5 miles north of Fallon (Mus. Vert. Zool.); 4 miles west of Fallon (U. S. N. M.); Fallon (U. S. N. M.); Sand Spring (Burt, 1933, p. 238).

Mineral County: 4 miles northwest of Hawthorne (Mus. Vert. Zool.).

Esmeralda County: Columbus (Van Denburgh, 1922, p. 335); Fish Lake (Mus. Vert. Zool.); 2 miles northwest of Cave Spring, 5,700 feet (Mus. Vert. Zool.); Grapevine Mountains (U. S. N. M.).

Nye County: Amargosa River, $3\frac{1}{2}$ miles northeast of Beatty (Mus. Vert. Zool.); Ash Meadows (U. S. N. M.); Ash Meadows, 3.2 miles west southwest of Devil's Hole (Mus. Vert. Zool.); Rhyolite (Calif. Acad. Sci.); Railroad Valley, 11 miles south of Lock's Ranch (Mus. Vert. Zool.).

Lincoln County: 9 and 16 miles east of Groom Baldy (Mus. Vert. Zool.); Crystal Spring (Mus. Vert. Zool.); $\frac{3}{4}$ mile west of Ash Spring (Mus. Vert. Zool.); Pahrnagat Valley (U. S. N. M.); Pahrnagat Mountains (U. S. N. M.); Caliente (Calif. Acad. Sci.); Meadow Valley, 21 miles south of Caliente (Mus. Vert. Zool.).

Clark County: Pahrump Valley (U. S. N. M.); Indian Spring Valley (U. S. N. M.); Kyle Cañon, 4,000 feet, Charleston Mountains (Cowles and Bogert, 1936, p. 38); Kaolin (Mus. Vert. Zool.); Overton (Cowles and Bogert, 1936, p. 38); Bunkerville (U. S. N. M.); Indian Spring, 4,000 feet, Virgin Mountains (Mus. Vert. Zool.); Vegas Valley (U. S. N. M.); Callville (U. S. N. M.); Jean (Klauber, 1932, p. 122); Piute Valley, 1 mile north of California line (Klauber, 1932, p. 122); Colorado River, 25 miles above Boulder Dam (Borell, spec.).

Stejneger (1893, p. 179) was first to find characters to distinguish *S. clarkii* and *S. magister*. He decided that the most distinctive character was the difference in the spiny scales which protect the anterior border of the ear opening. He wrote that "the constancy of the character was soon verified in a large series of specimens, as well as the concomitancy of the presence or absence of dusky markings on the dorsal aspect of the forearm and hand."

Later, Burt (1935, p. 275) concluded that these forms show no constancy "in their described characters when examined in large numbers, the

oldest males tending to have better developed ear denticulations than the rest of the population. Like other reptile species of the West, the ground color of the back is darker at higher altitudes and lighter (or more brownish) about the desert floor."

The climbing habits of this lizard as observed in Washoe County were reported by Richardson (1915, p. 419). Near Pyramid Lake he found it in bushes along the Truckee River, on tufa cliffs near the lake, on volcanic rocks in the hills, and along the lake shore, but never far out on the desert. At Derby it was found in two types of surroundings—in and about bushes near the river where it was abundant, and on rocky hillsides. He noted that as individuals ran from bush to bush, they lifted their tails above the level of the body much in the manner of gridiron-tailed lizards. It was seen basking on rocks with the smaller fence lizard. Van Denburgh and Slevin (1921, p. 34) report that specimens taken in the vicinity of Pyramid Lake, in July, were "usually found on the ground under thorn bushes" and they "were bright green and very wild." All specimens they obtained from Rhyolite and Caliente were found on rocks on the hillsides.

In the vicinity of Crystal Spring, Pahrnagat Valley, in May 1932, this species was abundant near the creek mostly among bushes or climbing in the cottonwoods. One was caught under a board at the base of a cottonwood. One was shot on a willow and another in leaves under an *Atriplex* bush. Fitch (MS) observed the species in this vicinity on rocks and fence posts.

Merriam (in Stejneger, 1893, p. 182) observed that unlike most of the lizards inhabiting the same region, this one does not run about on the open desert, but lives on the tree yuccas, the ruins of stone or adobe dwellings, the nests of wood rats, and other objects that afford it shelter and protection. In Pahrnagat Valley he found it abundant about the ruins of stone houses and along the faces of cliffs. He found both insects and flowers in the stomachs.

Sceloporus occidentalis bi-seriatus

Hallowell

Fence Lizard

Original description.—*Sceloporus bi-seriatus* Hallowell, Proc. Acad. Nat. Sci. Phila., vol. 7, 1854, p. 93 (El Paso Creek and Tejon Valley, Kern County, California).

Synonyms for Nevada.—*Sceloporus undulatus* subspecies *undulatus*, Yarrow, 1875, p. 573.

Sceloporus smaragdinus, Yarrow, 1883, p. 62.

Sceloporus undulatus thayeri, Yarrow, 1883, p. 60.

Sceloporus biseriatus, Richardson, 1915, p. 421.

Sceloporus occidentalis biseriatus, Van Denburgh and Slevin, 1921, p. 34.

Sceloporus undulatus bi-seriatus, Burt, 1933, p. 238.

Sceloporus undulatus elongatus, Burt, 1933, p. 243.

Range.—From eastern Oregon and southern Idaho south to northern Lower California and from southern California to Wyoming and Texas.

Occurrence in Nevada.—This race of fence lizard is abundant throughout the state except the extreme southern part. Records show it to be present mainly in the mountains above 4,000 feet; they extend as high at least as 9,000 feet.

Nevada localities (Fig. 15) (215 specimens in Museum of Vertebrate Zoology).—

Washoe County: Little High Rock Cañon (Mus. Vert. Zool.); Rock Creek, 5,000 feet, Granite Mountains (Mus. Vert. Zool.); 10 miles north-northwest of Deephole, 5,150 feet (Mus. Vert. Zool.); Smoke Creek Desert (U. S. N. M.); Horse Cañon, Pahrump Peak (Mus. Vert. Zool.); 6 miles south of Pahrump Peak (Mus. Vert. Zool.); Sutcliffe (Calif. Acad. Sci.; U. S. N. M.); The Willows (U. S. N. M.); Pyramid (Calif. Acad. Sci.); Verdi (Calif. Acad. Sci.; U. S. N. M.); Reno (Calif. Acad. Sci.); 10 miles east of Reno, 4,500 feet (Mus. Vert. Zool.); 2 miles west of Reno Hot Springs (Mus. Vert. Zool.); Galena Creek, 6,500 feet (Mus. Vert. Zool.); 1 mile north of Incline (Mus. Vert. Zool.).

Ormsby County: Carson City (U. S. N. M.).

Douglas County: Glenbrook (Calif. Acad. Sci.; U. S. N. M.).

Humboldt County: Virgin Valley (Mus. Vert. Zool.); Big Creek Ranch (Mus. Vert. Zool.); Limestones (Mus. Vert. Zool.); Red hills, Quinn River Crossing (Mus. Vert. Zool.); 4 miles east of Winnemucca (Univ. Mich.).

Elko County: Goose Creek, 2 miles west of Utah line (Mus. Vert. Zool.); west side of Ruby Lake (Mus. Vert. Zool.); Ruby Mountains (Calif. Acad. Sci.).

Pershing County: 8 miles south of Sulphur, 4,350 feet (Mus. Vert. Zool.); El Dorado Cañon, 6,000 feet, Humboldt Range (Mus. Vert. Zool.);

east side Granite Peak, East Range (Mus. Vert. Zool.).

Churchill County: Mountain Well (Mus. Vert. Zool.).

Lander County: Austin (Calif. Acad. Sci.); Big Creek, 6,700 feet (Mus. Vert. Zool.); Kingston Creek, 7,000 and 7,500 feet (Mus. Vert. Zool.); Clear Creek, 6,500 feet (Mus. Vert. Zool.).

Eureka County: 3½ miles southeast of Palisade (Mus. Vert. Zool.); 8 miles west of Eureka (Mus. Vert. Zool.).

White Pine County: Willow Creek, 2 miles south of county line (Mus. Vert. Zool.); 8 miles west of Illipah (U. S. N. M.); Smith Creek Cave, near Mt. Moriah (Mus. Vert. Zool.); Lehman Cave (Mus. Vert. Zool.); Baker Creek, 7,500 feet (Mus. Vert. Zool.); Water Cañon, 8 miles north of Lund (Mus. Vert. Zool.).

Mineral County: Endowment Mine (Mus. Vert. Zool.).

Esmeralda County: Chiatovich Creek, 7,000 feet (Mus. Vert. Zool.); 2 miles south of Piper Peak, 7,700 feet (Mus. Vert. Zool.); Cave Spring (Mus. Vert. Zool.); Goldfield (Calif. Acad. Sci.); Mount Magruder (U. S. N. M.); Grapevine Mountains (U. S. N. M.).

Nye County: Wisconsin Creek 7,800 to 9,000 feet (Mus. Vert. Zool.); Ophir Creek, 6,500 feet (Mus. Vert. Zool.); South Twin River, 6,500 and 7,000 feet (Mus. Vert. Zool.); Mohawk R. S. (Mus. Vert. Zool.); Pablo Creek (U. S. N. M.); Peavine Creek, 6,000 feet (U. S. N. M.); Round Mountain (Calif. Acad. Sci.); Jefferson R. S. (U. S. N. M.); Tonopah (Calif. Acad. Sci.); 8 to 9 miles east of Cliff Spring, 6,100 feet (Mus. Vert. Zool.); Garden Valley, 8½ miles northeast of Sharp (Mus. Vert. Zool.); Belted Range, 2 miles northwest of Indian Spring (Mus. Vert. Zool.); 5 miles west of White Rock Spring (Mus. Vert. Zool.); near Oak Spring, 5,700 feet (Mus. Vert. Zool.); south end of Kawich Mountains (Mus. Vert. Zool.); White River Valley, 14 miles southwest of Sunnyside (Mus. Vert. Zool.); Hot Creek Range, 4 miles north of Hot Creek, 6,400 feet (Mus. Vert. Zool.); Railroad Valley, 3 miles south of Nyala, 5,600 feet (Mus. Vert. Zool.); Burned Corral Cañon, 6,500 feet, Quinn Cañon Mountains (Mus. Vert. Zool.).

Lincoln County: Southwest base of Groom Baldy, 7,200 feet (Mus. Vert. Zool.); Caliente (Calif. Acad. Sci.); Meadow Valley, 21 miles south of Caliente (Mus. Vert. Zool.).

Clark County: Charleston Mountains (U. S. N.

M.); Charleston Park, 7,800 feet (San Diego Soc. Nat. Hist.); Kyle Cañon and Harris Spring, 4,000 to 6,000 feet, Charleston Mountains (Cowles and Bogert, 1936, p. 38); Kyle Cañon, 6,000 feet (Mus. Vert. Zool.).

The systematic relationships of *S. o. bi-seriatus* in eastern Nevada have been discussed by Burt (1933, p. 240) who decided that the numbers of scales from the occiput to the base of the tail provided the most constant difference between *bi-seriatus* and *elongatus*. On this basis he concluded that "if we arbitrarily regard all of these lizards having 42 or less than 42 scales from the occiput to the base of the tail as *bi-seriatus* and those having more than this number as *elongatus*, a zone of intergradation between the two forms becomes evident in eastern Nevada and western Utah where the ranges of the two subspecies meet and overlap. This phenomenon is noted in the present specimens from White Pine County, Nevada, and an intergrade with a count of 43 was collected in Eureka County to the west. Throat patches of intergrades in Nevada may be united as in *bi-seriatus* instead of separated as in *elongatus* of the west and south."

My own examination of specimens has failed to demonstrate the close relationship of these two forms implied in the quotation just given. To me the color pattern, especially the blue throat patches, is more diagnostic than number of dorsal scales. The specimens I have seen bear out Van Denburgh's (1922) treatment of these two lizards. However, it would not be surprising if further material from some place eastward from Nevada showed closer relation between the two forms.

Observations on the behavior of fence lizards in the breeding season were made on June 13, 1932, by Fitch (MS) in Water Cañon, 8 miles north of Lund, White Pine County. A male on a large boulder near the camp was feeding on flies which it caught by sudden rushes before they had time to move. A dead male lizard of the same species attached to a fine wire was dragged over the surface of the rock. The live one immediately ran to it and bit its side, and then followed it away from the rock, running alongside and nipping at it.

Several yards distant another male came into view, pursuing a female which it overtook and caught by grasping in its mouth a fold of skin about an inch behind the axilla. These lizards lost their foothold on the slanting rock surface and rolled several feet, finally falling to the ground. After a short struggle, the female freed herself and escaped from the pursuing male.

By maneuvering the dead lizard the first male was attracted to the smaller one that had been seen with the female. The dead one then was removed and the first male transferred his attention to the second one. His actions were the same as had been shown toward the dead one. Standing high off the ground, with body compressed and showing to advantage the bright blue patches on throat and abdomen, it moved jerkily toward the other one. The second male at first displayed in a similar manner, but when the first one approached and nipped at it, it retreated and made an almost continuous run to a ledge of rock about 30 feet away.

One method of fighting observed here was for one animal to run past another in a direction opposite to its course and to bite at its legs or abdomen as it passed. At the same time the aggressor would move the tail and hind quarters quickly and strike a sharp blow on its opponent's head. This method of attack appeared to be just as effective as biting.

When a mirror was placed on a rock near one of the males its reaction to the image was like that toward another live lizard, except that it lost interest in about two minutes.

Several times a fighting male suddenly broke off its attack, when no cause for disturbance was detected, and ran to hide in a crevice; each time it returned after a few seconds.

When the dead male was dragged near the female, the latter stood high with tail elevated and moved with a half running, half hopping gait, turning to nip at the male when it was brought too close.

On June 28, 1934, Fitch (MS) found a pair of fence lizards copulating on a rock near the Truckee River, 5 miles west of Reno. This is evidence of a difference of about two months in the breeding cycle here and on the coast.

Throughout northwestern Nevada, this lizard was found to be a rock-dwelling form by Richardson (1915, p. 421). Two females taken on May 24 at Reno, held 7 and 10 eggs.

The restriction to rocky places was also noted by Ruthven and Gaige (1915, p. 20) in the upper Humboldt Valley, where they found fence lizards in such places as cliffs, outcrops, talus slopes, and stream beds. They observed that the lizards on warm days, were quite common everywhere over the rocks until the hottest part of the day, when they retired to the shaded side. Large females obtained on and before July 12 contained large eggs about ready to be laid; those collected on July 22 had deposited their eggs. On August 14,

young ones, several days old, were seen. One that was captured measured 55 mm. in total length. They ran over the ground and small rocks at the base of a cliff and, when alarmed, sought concealment under loose stones.

Courtship behavior in this species was watched on June 1, 1932, in the hills at 5,900 feet, east of Cliff Spring, Nye County (Fitch, MS). Here there were juniper trees and a few piñons on the rocky ground. Numerous fence lizards were seen on the rocks. A male and a female were seen sunning themselves on a large boulder. As the observer approached slowly they moved from one boulder to another, both always stopping on top of the same rock and within a few inches of each other. Several times the male displayed near the female, arching his back, raising his tail, advancing with short, jerky movements and standing high off the surface of the rock with throat pouch extended. Several times he moved up and pushed the female with his snout. At such times the female sidled away.

Phrynosoma douglassii ornatissimum

(Girard)

Pigmy Horned-toad

Original description.—*Tapaya ornatissima* Girard, U. S. Expl. Exped., Herp., 1858, p. 396 (mountainous region of New Mexico).

Synonyms for Nevada.—*Phrynosoma douglassii* subspecies *douglassii*, Yarrow, 1875, p. 580.

Phrynosoma douglassii douglassii, Yarrow, 1883, p. 69.

Phrynosoma douglassii hernandesi, Richardson, 1915, p. 423.

Phrynosoma hernandesi, Ruthven and Gaige, 1915, p. 23.

Occurrence in Nevada.—Specimens are available from several localities in the northeast part of the state, west on the north side of the Humboldt River as far as the Santa Rosa Mountains, and south near the eastern border to about 39° N.

Nevada localities (Fig. 16) (9 specimens in Museum of Vertebrate Zoology).—

Humboldt County: Martin Creek R. S., Santa Rosa Mountains (Mus. Vert. Zool.).

Elko County: Mountain City (U. S. N. M.); Cobb Creek, 6 miles southwest of Mountain City, 6,550 feet (Mus. Vert. Zool.); Marys River, 22 miles north of Deeth (Mus. Vert. Zool.); near Deeth (Van Denburgh, 1922, p.

381); Halleck (U. S. N. M.); 3 miles south of Halleck (U. S. N. M.); Carlin (Univ. Mich. Mus.); James Cañon (Univ. Mich. Mus.).

White Pine County: 7 miles southeast of Hobson P. O. (Mus. Vert. Zool.); Water Cañon, 8 miles north of Lund (Mus. Vert. Zool.).

The record of this species from 2 miles north of Fernley (Burt and Burt, 1929, p. 454) apparently was based on a specimen now in the University of Michigan collection. I examined this specimen on October 8, 1933, and found it to be a young individual of *P. platyrhinos*. The locality is more than 160 miles from the nearest one listed above.

The pigmy horned-toads were found by Ruthven and Gaige (1915, p. 24) in Elko County, during the warmer parts of the day. At night they burrowed beneath the surface of the ground. The adults kept close to the shelter of bushes where their broken coloration was protective. The young ones with even coloration were observed more often in the open. Females taken on July 26, contained embryos. By August 7 and 8 all adult females had given birth to their young which were found in numbers.

***Phrynosoma platyrhinos* Girard**

Desert Horned-toad

Original description.—*Phrynosoma platyrhinos* Girard, Stansbury's Expl. Surv. Vall. Great Salt Lake, 1852, pp. 361, 363, pl. 7, figs. 1-5 (Great Salt Lake Valley, Utah).

Synonyms for Nevada.—*Phrynosoma maccalli*, Yarrow, 1883, p. 65.

Phrynosoma platyrhinum, Yarrow, 1883, p. 65.

Phrynosoma douglassii ornatissimum, Burt and Burt, 1929, p. 454.

Phrynosoma platyrhinos platyrhinos, Cowles and Bogert, 1936, p. 38.

Range.—From Washington and Idaho south to northeastern Lower California and from eastern California to western Utah.

Occurrence in Nevada.—This horned toad is common in the valleys and flat areas over most of the state above the 2,000-foot level. Places of record are as high as 6,500 feet, and most of them are above 4,000 feet. The soil over most of this lizard's range is sandy or gravelly.

Nevada localities (Fig. 16) (253 specimens in Museum of Vertebrate Zoology).—

Washoe County: High Rock Cañon (Mus. Vert. Zool.); Little High Rock Cañon (Mus. Vert.

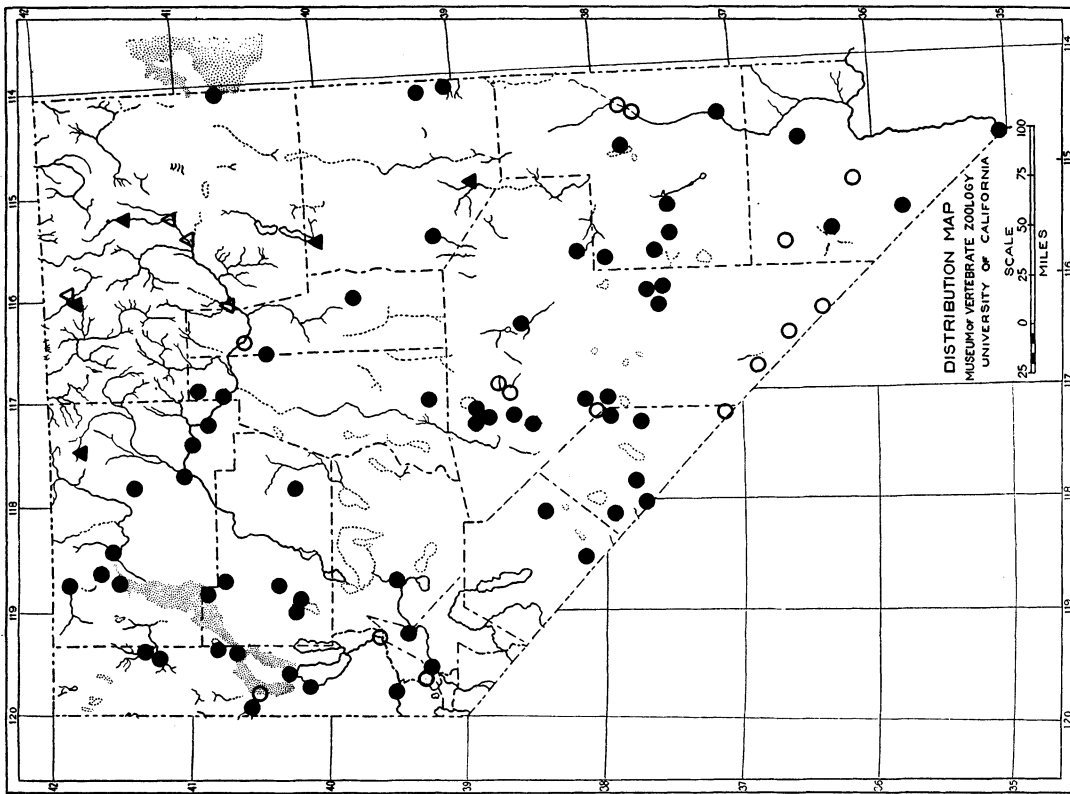


FIG. 16. Distribution of *Phrynosoma douglassii ornabissimum* (triangles) and *Phrynosoma platyrhinos* (circles) in Nevada.

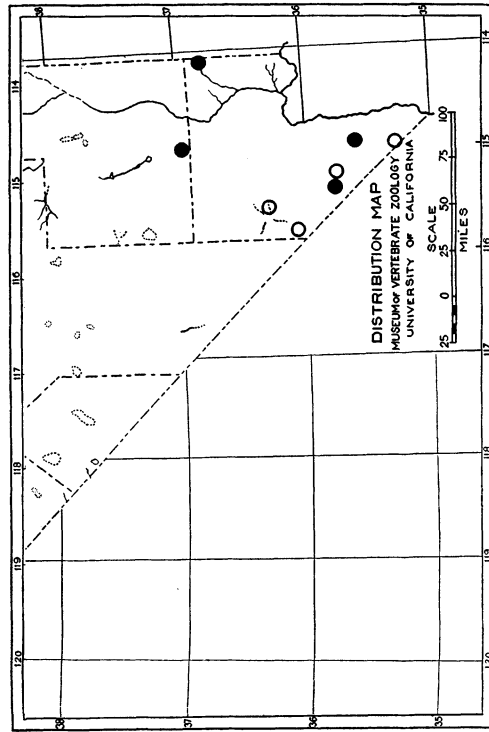


FIG. 17. Distribution of *Xantusia vigilis* in southern Nevada.

- Zool.); Smoke Creek, 3,900 feet (Mus. Vert. Zool.); $4\frac{1}{2}$ miles northeast of Flanigan, 4,100 feet (Mus. Vert. Zool.); 1 mile northeast of Gerlach, 4,000 feet (Mus. Vert. Zool.); $2\frac{1}{2}$ miles east and 11 miles north of Gerlach (Mus. Vert. Zool.); 4 miles west of Pahrump Peak (Mus. Vert. Zool.); 1 mile north of Pyramid (Mus. Vert. Zool.); Pyramid Lake (Calif. Acad. Sci.; U. S. N. M.); Reno (Calif. Acad. Sci.); east of Reno (U. S. N. M.); 10 miles east of Reno (Mus. Vert. Zool.); Smoke Creek Desert (U. S. N. M.); Wadsworth (U. S. N. M.).
- Storey County: Virginia City (U. S. N. M.).
- Lyon County: 2 miles north of Fernley (Univ. Mich.); Lincoln Highway, 22 miles west of Fallon (Mus. Vert. Zool.); $6\frac{1}{2}$ miles east of Dayton (Mus. Vert. Zool.).
- Humboldt County: Limestones (Mus. Vert. Zool.); Thousand Creek Basin (Mus. Vert. Zool.); Leonard Creek (Mus. Vert. Zool.); Big Creek, 4,350 and 5,000 feet (Mus. Vert. Zool.); near Amos P. O. (Mus. Vert. Zool.); Big Creek (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.); 5 miles south of Quinn River Crossing, 4,000 feet (Mus. Vert. Zool.); 5 miles northeast and 1 mile south of Golconda (Mus. Vert. Zool.); Golconda (U. S. N. M.); 26 miles northwest of Battle Mountain (Mus. Vert. Zool.); 7 miles north of Winnemucca (Mus. Vert. Zool.).
- Elko County: 3 miles southwest of Wendover, Utah (Mus. Vert. Zool.); head of Humboldt River (U. S. N. M.).
- Pershing County: Buena Vista Valley, 4,150 feet, 10 miles east and 3 miles south of Fanning (Mus. Vert. Zool.); 3 miles southwest of Vernon, 4,300 feet (Mus. Vert. Zool.); 8 miles south of Sulphur, 4,350 feet (Mus. Vert. Zool.); 10 miles west and 6 miles north of Sulphur, 4,000 feet (Mus. Vert. Zool.); 21 miles west and 2 miles north of Lovelock, 4,000 feet (Mus. Vert. Zool.); 30 miles west and 4 miles north of Lovelock, 4,300 feet (Mus. Vert. Zool.).
- Churchill County: 5 miles north of Fallon (Mus. Vert. Zool.).
- Lander County: 14 miles north of Battle Mountain (Mus. Vert. Zool.); 3 miles south of Izenhood (Mus. Vert. Zool.); Smoky Valley, between Birch and Kingston creeks (Mus. Vert. Zool.); 8 miles northeast of Tenabo (Mus. Vert. Zool.).
- Eureka County: Beowawe (U. S. N. M.); 4 miles southeast of Romano, Diamond Valley (Mus. Vert. Zool.); 12 and 16 miles northeast of Tenabo (Mus. Vert. Zool.).
- White Pine County: Near Smith Creek Cave, Mt. Moriah (Mus. Vert. Zool.); near Baker (Mus. Vert. Zool.; U. S. N. M.); $2\frac{1}{2}$ miles southwest of Hamilton, 7,600 feet (Mus. Vert. Zool.).
- Mineral County: Huntoon Valley, 5,700 feet (Mus. Vert. Zool.); Mina.
- Esmeralda County: 7 miles north of Arlemont, 5,500 feet (Mus. Vert. Zool.); Arlemont (Mus. Vert. Zool.); $2\frac{1}{2}$ miles southeast of Dyer (Mus. Vert. Zool.); Fish Lake (Mus. Vert. Zool.); Cave Spring (Mus. Vert. Zool.); 10 and 15 miles south of Tonopah (Mus. Vert. Zool.); $13\frac{1}{2}$ miles northwest of Goldfield (Mus. Vert. Zool.); Goldfield (Calif. Acad. Sci.); Grapevine Mountains, 4,200 feet (U. S. N. M.).
- Nye County: Wisconsin Creek, 6,000 feet (Mus. Vert. Zool.); North of Twin River, 6,000 feet (Mus. Vert. Zool.); South Twin River, 6,500 feet (Mus. Vert. Zool.); Pablo Creek, 6,200 feet (U. S. N. M.); Peavine Creek, 6,000 feet (U. S. N. M.); Smoky Valley, 5 miles south and 5 miles southeast of Millett P. O. (Mus. Vert. Zool.); Jefferson Creek, 6,300 feet (U. S. N. M.); Round Mountain, 6,300 feet (U. S. N. M.); Ralston Valley, $15\frac{1}{2}$ miles northeast of Tonopah, 5,800 feet (Mus. Vert. Zool.); Tonopah (Calif. Acad. Sci.); 8 miles southeast of Tonopah (Mus. Vert. Zool.); near Indian Spring, Belted Range (Mus. Vert. Zool.); 1 mile south of Big Dry Lake, Kawich Valley; $7\frac{1}{2}$ and 8 miles east of Cliff Spring, 5,900 feet (Mus. Vert. Zool.); Railroad Valley, 3 miles south of Nyala, 5,600 feet (Mus. Vert. Zool.); Hot Creek Valley 2 to 10 miles north of Hot Creek, 5,900 feet (Mus. Vert. Zool.); Rhyolite (Calif. Acad. Sci.); Amargosa Desert (U. S. N. M.); Ash Meadows (U. S. N. M.).
- Lincoln County: Penoyer Valley, 14 miles north northwest of Groom Baldy (Mus. Vert. Zool.); 9 miles east of Groom Baldy, 5,500 feet (Mus. Vert. Zool.); Hancock Pass, west of Crystal Spring (Mus. Vert. Zool.); near Crystal Spring (Mus. Vert. Zool.); north end of Penoyer Valley (Mus. Vert. Zool.); 20 miles southwest of Pioche (Mus. Vert. Zool.); Panaca (U. S. N. M.); 21 miles west of Panaca (Mus. Vert. Zool.); Caliente (Calif. Acad. Sci.); 4 miles northeast of Carp (Mus. Vert. Zool.).
- Clark County: Indian Spring Valley (U. S. N. M.); 12 miles east of Charleston Park, 4,400 feet (Mus. Vert. Zool.); Las Vegas (Calif. Acad. Sci.; U. S. N. M.); 2 miles south of Jean (Mus. Vert. Zool.); $1\frac{1}{2}$ miles northwest of Fort Mojave, 500 feet (Mus. Vert. Zool.); Hiko

Spring, 2,200 feet, Dead Mountains (Mus. Vert. Zool.); Valley of Fire, 15 miles southeast of Crystal (Mus. Vert. Zool.); Boulder City (Cowles and Bogert, 1936, p. 39).

In the northwestern part of the state Richardson (1915, p. 423) observed this lizard on the desert among low bushes. In attempting to escape it ran beneath the bushes rather than into mammal burrows. On a long run it often raised its tail above the level of the sand. Two stomachs contained ants, beetles, and insect larvae. Three females captured at the end of May, and June 2 and 9, held 13, 9, and 13 eggs.

Taylor (1912, p. 351) found this horned-toad to be more common near the foothills of the Pine Forest Mountains than away from them on the open desert. The animals were found on sandy, on loamy, and on sun-baked hard soil. One, when picked up, opened its mouth and made a hissing sound. Copulation was noted on June 10 and on June 14 a female containing ten eggs was captured.

At 6 p. m. on July 31, 1934, five small horned-toads, apparently all members of a single brood were found by D. H. Johnson (MS) one mile southeast of Wadsworth, 4,200 feet, Lyon County. The animals were scattered over a single square yard of a level and sandy abandoned field then covered with Russian thistles. They were attempting to find cover beneath the plants.

Near Crystal Spring, Lincoln County, Fitch (MS) found a horned-toad sunning itself at 5:45 a. m. on May 19, 1932.

HELODERMATIDAE

***Heloderma suspectum* Cope**

Gila Monster

Original description.—*Heloderma suspectum* Cope, Proc. Acad. Nat. Sci. Phila., 1869, p. 5 (Sierra de la Union, Arizona ["Sonora"]).

Range.—Southern Nevada and Utah, Arizona and Sonora.

Occurrence in Nevada.—Records are all in the southeastern corner of the state, as far west as Las Vegas and as far north as Meadow Valley, but mostly in the vicinity of the Virgin River. So few specimens have been discovered as to indicate a small population likely to become exterminated within the state.

Nevada localities (No specimens in Museum of Vertebrate Zoology).—

Lincoln County: Meadow Valley (Van Denburgh, 1922, p. 473).

Clark County: Virgin River, 8 miles below Bunkerville (U. S. N. M.); Overton (Cowles and Bogert, 1936, p. 39); Saint Thomas (Van Denburgh, 1922, p. 473); Las Vegas (Van Denburgh, 1922, p. 473).

XANTUSIIDAE

***Xantusia vigilis* Baird**

Desert Night Lizard

Original description.—*Xantusia vigilis* Baird, Proc. Acad. Nat. Sci. Phila., 1858 [1859], p. 255 (Fort Tejon, California).

Range.—Southeastern California, southern Nevada, and northeastern Lower California.

Occurrence in Nevada.—Specimens represent localities in the southern part of the state, as far north as Coyote Spring, near 37° N., and at altitudes up to 4,000 feet. Individuals have been captured about the dead limbs and stumps of Joshua trees and Spanish dagger, more frequently the latter.

Nevada localities (Fig. 17) (34 specimens in Museum of Vertebrate Zoology).—

Lincoln County: Coyote Spring, 2,500 feet (Mus. Vert. Zool.).

Clark County: Pahrump Valley (U. S. N. M.); Kyle Cañon, about 4,000 feet, Charleston Mountains (Cowles and Bogert, 1936, p. 39); 10 miles east of Jean (Cowles and Bogert, 1936, p. 39); 5 miles north of Jean (Klauber, 1932, p. 123); 1 mile west of Jean (Mus. Vert. Zool.); Piute Valley, 1 mile north of California line (Klauber, 1932, p. 123); 14 miles north of Searchlight, 3,500 feet (Mus. Vert. Zool.); 3 miles south of Mesquite, 2,500 feet (Mus. Vert. Zool.).

TEIIDAE

***Cnemidophorus tessellatus tessellatus* (Say)**

Whip-tailed Lizard

Original description.—*Ameiva tessellata* Say, Long's Exp. Rocky Mts., vol. 2, 1823, p. 50 (Arkansas River, near Castle Rock Creek, Colorado).

Synonyms for Nevada.—*Cnemidophorus tigris*, Richardson, 1915, p. 425.

Cnemidophorus tessellatus tessellatus, Cowles and Bogert, 1936, p. 39.

Range.—Eastern Oregon and southern Idaho south to southern Coahuila, Mexico and from California to western Texas.

Occurrence in Nevada.—Whip-tailed lizards

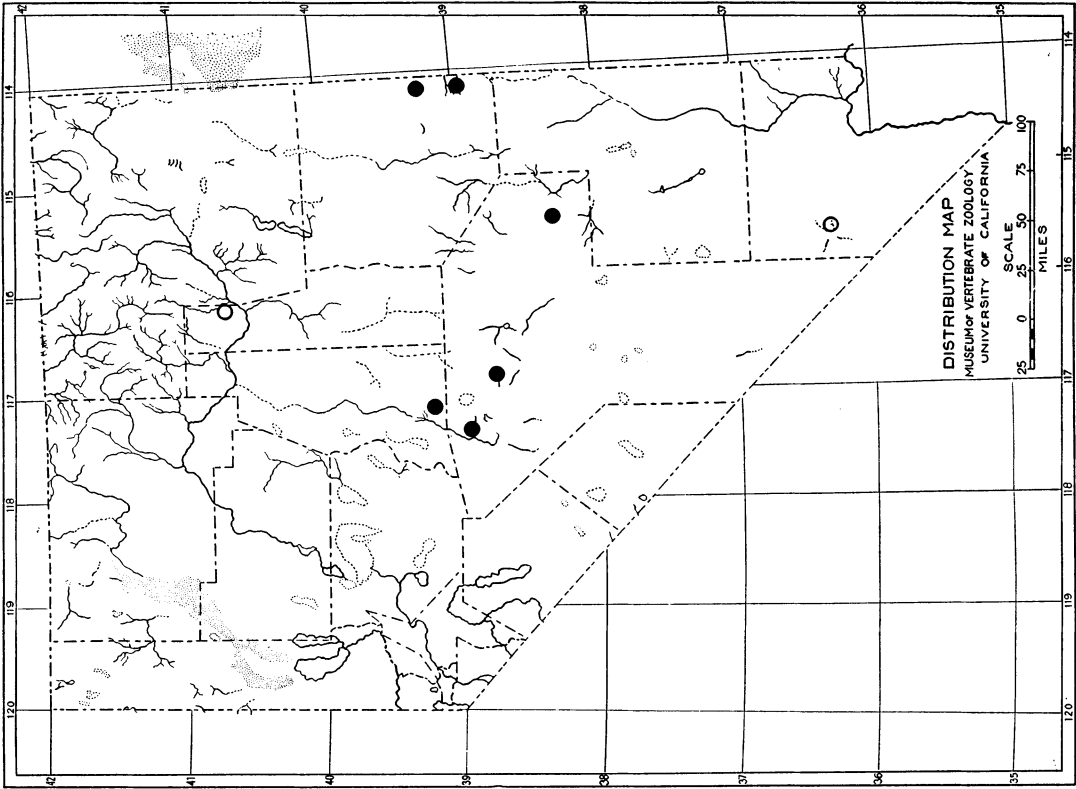


FIG. 19. Distribution of *Eumeces skiltonianus* in Nevada.

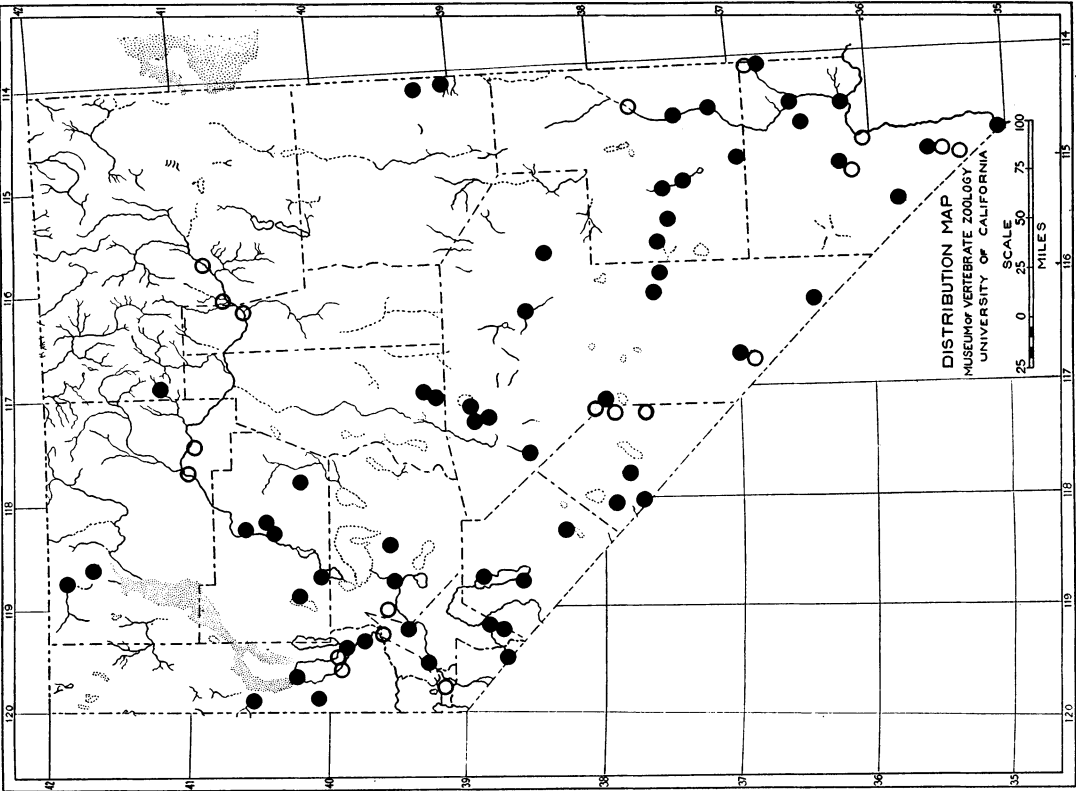


FIG. 18. Distribution of *Cnemidophorus tessellatus* in Nevada.

live in the valleys and flats throughout the state at altitudes up to at least 6,500 feet.

Nevada localities (Fig. 18) (419 specimens in Museum of Vertebrate Zoology).—

Washoe County: Smoke Creek (U. S. N. M.); Smoke Creek, 3,900 feet, 9 miles east of California line (Mus. Vert. Zool.); near Sand Pass (Mus. Vert. Zool.); Fox Cañon, south of Pahrum Peak (Mus. Vert. Zool.); Flanigan, 4,200 feet (Mus. Vert. Zool.); north end of Pyramid Lake (Mus. Vert. Zool.; U. S. N. M.); The Willows (Burt, 1931, p. 185); Pyramid Lake Indian Agency (Mus. Vert. Zool.; U. S. N. M.); Anaho Island (U. S. N. M.); Sutcliffe (U. S. N. M.); Nixon (U. S. N. M.); between Pyramid Lake and Reno (Acad. Nat. Sci. Phila.); Truckee River, 12 miles northwest of Wadsworth (Mus. Vert. Zool.); Wadsworth (U. S. N. M.).

Ormsby County: Carson City (U. S. N. M.).

Douglas County: Topaz Lake (Mus. Vert. Zool.).

Lyon County: 1 mile southeast of Fernley (Burt, 1933, p. 248); Lincoln Highway, 22 miles west of Fallon (Mus. Vert. Zool.); $6\frac{1}{2}$ miles east of Dayton (Mus. Vert. Zool.); 12 miles south of Yerington, West Walker River (Mus. Vert. Zool.); Mason Valley, 12 miles east of Wellington (Mus. Vert. Zool.).

Humboldt County: Pine Forest Mountains (Mus. Vert. Zool.); Thousand Creek (Mus. Vert. Zool.); Big Creek Ranch (Mus. Vert. Zool.); Golconda (U. S. N. M.); Winnemucca (Burt, 1931, p. 185).

Elko County: Carlin (U. S. N. M.); Annie Creek (Univ. Mich.); Maggie Creek (Univ. Mich.); Elko (Burt, 1931, p. 185); 11 miles southwest of Midas (Mus. Vert. Zool.).

Pershing County: 21 miles west and 2 miles north of Lovelock, 4,000 feet (Mus. Vert. Zool.); Toulon, 3,900 feet (Mus. Vert. Zool.); $3\frac{1}{4}$ miles north northeast of Toulon (Mus. Vert. Zool.); 1 mile east of Oreana, 4,300 feet (Mus. Vert. Zool.); El Dorado Cañon, 6,000 feet, west base of Granite Peak, East Range (Mus. Vert. Zool.).

Churchill County: Hazen (Burt, 1931, p. 185); 5 miles north and $1\frac{1}{2}$ miles southwest of Fallon (Mus. Vert. Zool.); 4 miles northwest of Fallon (Burt, 1933, p. 248); $4\frac{1}{2}$ miles east of Stillwater, 4,000 feet (Mus. Vert. Zool.).

Lander County: Smoky Valley, between Birch and Kingston creeks (Mus. Vert. Zool.); Kingston Creek, 6,000 feet (Mus. Vert. Zool.).

Eureka County: Palisade (Burt, 1931, p. 185).

White Pine County: Baker (Mus. Vert. Zool.); near Smith Creek Cave, Mt. Moriah (Mus. Vert. Zool.).

Mineral County: 8 miles southeast of Schurz, 4,100 feet (Mus. Vert. Zool.); Cottonwood Creek, 7,000 feet, Mount Grant (Mus. Vert. Zool.); Endowment Mine (Mus. Vert. Zool.); Marietta (Mus. Vert. Zool.).

Esmeralda County: 15 miles south of Tonopah (Mus. Vert. Zool.); 7 miles north of Arleimont (Mus. Vert. Zool.); Arleimont (Mus. Vert. Zool.); Dyer (Mus. Vert. Zool.); Fish Lake (Mus. Vert. Zool.); Cave Spring (Mus. Vert. Zool.); Goldfield (Burt, 1931, p. 185).

Nye County: Wisconsin Creek, 6,000 feet (Mus. Vert. Zool.); Cloverdale Ranch (Mus. Vert. Zool.); South Twin River, 6,500 feet (Mus. Vert. Zool.); Smoky Valley, 2 miles south and 5 miles southeast of Millett P. O. (Mus. Vert. Zool.); Tonopah (Burt, 1931, p. 185); 8 miles southeast of Tonopah (Mus. Vert. Zool.); Amargosa River, $3\frac{1}{2}$ miles northeast of Beatty (Mus. Vert. Zool.); Oasis Valley (U. S. N. M.); 3 miles northeast and 2 miles southeast of Fairbanks Spring (Mus. Vert. Zool.); Shoshone Point (U. S. N. M.); Rhyolite (Calif. Acad. Sci.); 2 miles south of Big Dry Lake, Kawich Valley (Mus. Vert. Zool.); 6 and $7\frac{1}{2}$ miles east of Cliff Spring, 6,000 feet (Mus. Vert. Zool.); Hot Creek Valley, 5,900 feet (Mus. Vert. Zool.); Able Spring, 5,000 feet, Railroad Valley (Mus. Vert. Zool.).

Lincoln County: 14 miles north-northwest of Groom Baldy (Mus. Vert. Zool.); 16 miles east of Groom Baldy, 4,600 feet (Mus. Vert. Zool.); Crystal Spring (Mus. Vert. Zool.); Ash Spring (Mus. Vert. Zool.); Pahrnagat Valley (U. S. N. M.); 2 miles south of Alamo (Mus. Vert. Zool.); Desert Valley (Van Denburgh, 1922, p. 512); Caliente (Van Denburgh, 1922, p. 512); Meadow Creek Valley (Van Denburgh, 1922, p. 512); 21 miles south of Caliente, 3,200 feet (Mus. Vert. Zool.); 6 miles northeast of Carp, 3,000 feet (Mus. Vert. Zool.); Coyote Spring, 2500 feet (Mus. Vert. Zool.).

Clark County: Mesquite (San Diego Soc. Nat. Hist.); Saint Thomas (U. S. N. M.); valley of Muddy River (Van Denburgh, 1922, p. 512); valley of Virgin River (Van Denburgh, 1922, p. 512); near mouth of Virgin River (Mus. Vert. Zool.); Atlatl Rock, 2,000 feet, Valley of Fire (Mus. Vert. Zool.); 10 miles northeast of Las Vegas, 2,000 feet (Mus. Vert. Zool.); Las Vegas (Calif. Acad. Sci.); Vegas Valley (Van

Denburgh, 1922, p. 512); 1 mile west of Jean (Mus. Vert. Zool.); 6 and 13 miles north of Searchlight (Mus. Vert. Zool.); Searchlight (Klauber, 1932, p. 123); Piute Valley (Klauber, 1932, p. 123); Boulder City (Cowles and Bogert, 1936, p. 39); Hiko Spring, 2,000 feet (Mus. Vert. Zool.); 2 miles northwest of Fort Mojave, 500 feet (Mus. Vert. Zool.); 2 and 5 miles southeast of Overton, 1,300 feet (Mus. Vert. Zool.); Indian Spring, 4,000 feet, Virgin Mountains (Mus. Vert. Zool.); 3 miles south of Mesquite, 2,500 feet (Mus. Vert. Zool.).

At Las Vegas, Klauber (1932, p. 123) found this species in the mesquite sand-hummocks. He was impressed by the "peculiar jerky motion, with frequent pauses, that characterizes the progress of this lizard when undisturbed, as compared with its great speed when alarmed."

In Elko County, Ruthven and Gaige (1915, p. 26) found this lizard on the flats where sagebrush, salt bush, and rabbit brush grew. It was most abundant among the last type of plant where the growth was densest. When alarmed, they ran swiftly with tail elevated or dodged into a mammal burrow. Stomachs contained spiders and insects, mainly grasshoppers and beetles. One individual had eaten a recently hatched young one of the same species. Eggs were still carried in females collected as late as July 13, but they had been laid by August 8. The young one that had been eaten was found on August 14.

Near Crystal Spring, in Pahranaagat Valley, Lincoln County, Fitch (MS) on May 20, 1932, observed whip-tailed lizards to be abundant in the thick grass close to the water of a creek as well as among the bushes farther up the bank. It was also abundant two miles east of there on the ridges and in washes.

SCINCIDAE

Eumeces skiltonianus skiltonianus

(Baird and Girard)

Western Skink

Original description.—*Plestiodon Skiltonianum* Baird and Girard, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, p. 69 (Oregon).

Synonyms for Nevada.—*Plestiodon skiltonianus* Van Denburgh, 1922, p. 578.

Eumeces skiltonianus, Ruthven and Gaige, 1915, p. 26.

Range.—British Columbia to Lower California and east to Idaho and Utah.

Occurrence in Nevada.—Skinks have been collected on five mountain ranges, from the Cortez Mountains to the Charleston Mountains. Record stations are mainly at altitudes between 6,500 and 8,000 feet. The animals are not especially common in any of the localities; they spend so much time beneath cover and are so elusive as to be hard to capture.

Nevada localities (Fig. 19) (11 specimens in Museum of Vertebrate Zoology).—

Lander County: Kingston Creek, 7,000 feet, Toyabe Mountains (Mus. Vert. Zool.).

Eureka County: James Creek, Cortez Mountains (Univ. Mich. Mus.).

White Pine County: 2 miles west of Smith Creek Cave, Mt. Moriah (Mus. Vert. Zool.); Baker Creek, 6,300 feet, Snake Mountains (Mus. Vert. Zool.).

Nye County: Mohawk R. S., Toyabe Mountains (Mus. Vert. Zool.); 1 mile east of Jefferson, 7,600 feet, Toquima Mountains (Mus. Vert. Zool.); Scofield Cañon, 8,000 feet, Mount Grant (Mus. Vert. Zool.).

Clark County: Charleston Park (San Diego Soc. Nat. Hist.; Cowles and Bogert, 1936, p. 39).

Suborder Serpentes

BOIDAE

Charina bottae (Blainville)

Rubber Snake

Original description.—*Tortrix Bottae* Blainville, Nouv. Ann. Mus. Hist. Nat., vol. 4, 1835, pp. (57–58) 289–290, pl. 26, figs. 1, 1a, 1b (California [Monterey?]).

Synonyms for Nevada.—*Charina plumbea*, Yarrow 1883, p. 142.

Charina bottae bottae, Van Denburgh and Slevin, 1921, p. 36.

Range.—Washington south to San Bernardino Mountains, in California and east to Montana, Wyoming, and Utah.

Occurrence in Nevada.—The specimens known from the state are from localities close to or north of 39° N. Nine of them are from four mountain ranges as follows: Sierra Nevada; Santa Rosa Mountains; Jarbidge Mountains; Toyabe Mountains.

Nevada localities (Fig. 20) (7 specimens in Museum of Vertebrate Zoology).—

Washoe County: Big Bend of Truckee River (U. S. N. M.).

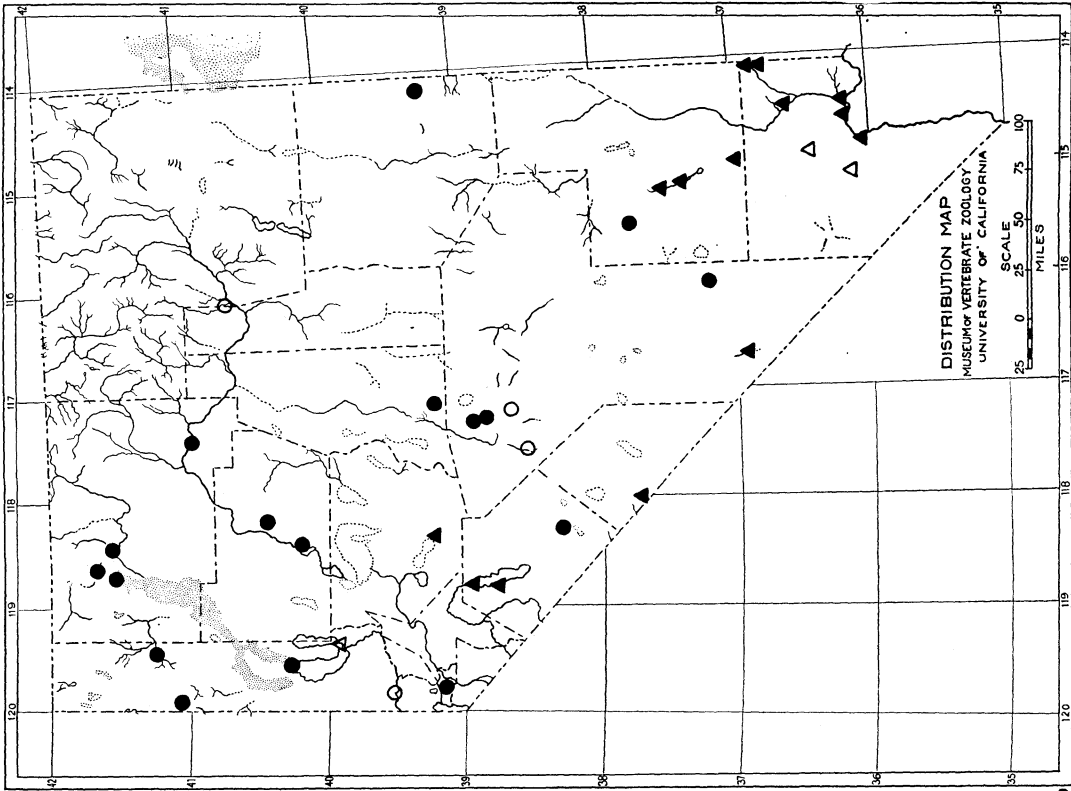


Fig. 21. Distribution of *Coluber flagellum frenatum* (triangles) and *Coluber taeniatus taeniatus* (circles) in Nevada.

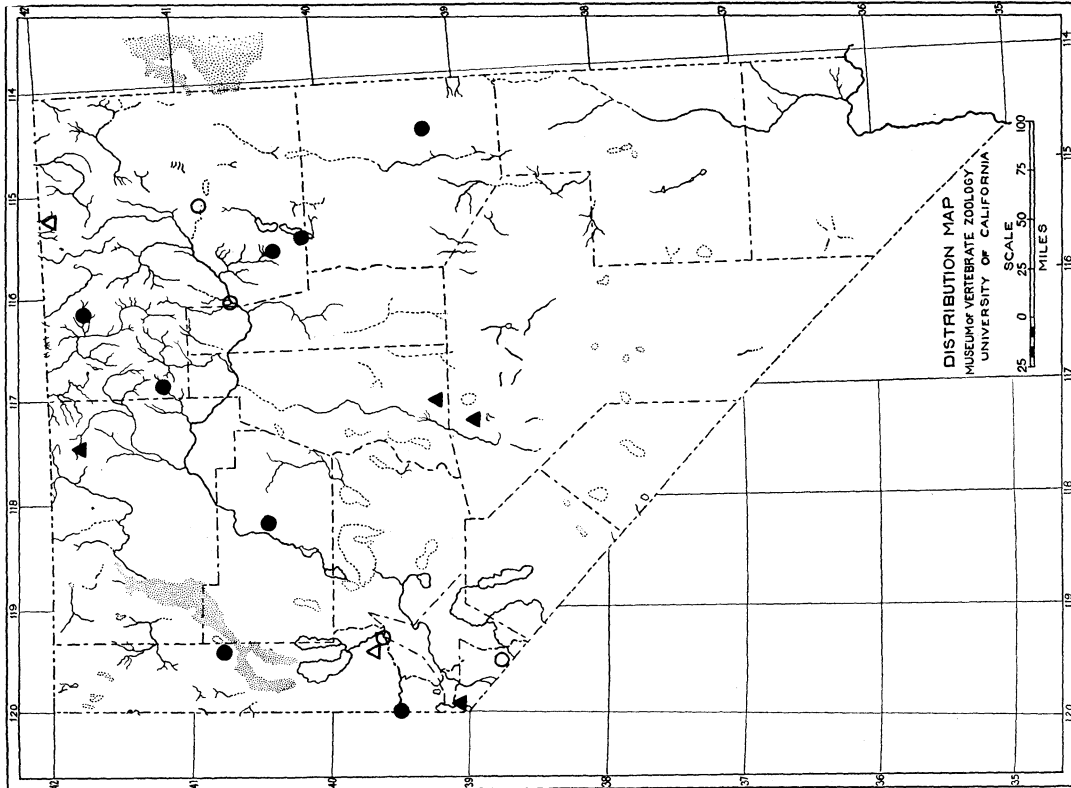


Fig. 20. Distribution of *Charina bottae* (triangles) and *Coluber constrictor mormon* (circles) in Nevada.

Ormsby County: no locality (U. S. N. M.).
 Douglas County: Glenbrook (Mus. Vert. Zool.; Calif. Acad. Sci.).
 Humboldt County: Martin Creek R. S., Santa Rosa Mountains (Mus. Vert. Zool.).
 Elko County: 10 miles east of Jarbidge (U. S. N. M.).
 Lander County: Kingston Creek, 6,400 and 7,000 feet, Toyabe Mountains (Mus. Vert. Zool.).
 Nye County: Summit Creek, 6,800 feet, Toyabe Mountains (Mus. Vert. Zool.); Wisconsin Creek, 7,800 feet, Toyabe Mountains (Mus. Vert. Zool.).

COLUBRIDAE

Coluber constrictor mormon Baird and Girard

Yellow-bellied Racer

Original description.—*Coluber mormon* Baird and Girard, Stansbury's Expl. Surv. Vall. Great Salt Lake, Append. C, Rept., 1852, p. 351 (Valley of Great Salt Lake, Utah).

Synonym for Nevada.—*Bascanion constrictor vetustum*, Richardson, 1915, p. 427.

Range.—This race occurs along the Pacific coast from southern British Columbia to San Diego County, California, and eastward at least to the valley of Great Salt Lake, Utah.

Occurrence in Nevada.—Except for the Douglas County record, all Nevada specimens are from north of 39° N. They are mainly from valleys in the high plateau districts above 4,000 feet. The highest record stations are a little over 6,000 feet.

Nevada localities (Fig. 20) (12 specimens in Museum of Vertebrate Zoology).—

Washoe County: Rock Creek, 5,000 feet, Granite Mountains (Mus. Vert. Zool.); Wadsworth (Richardson, 1915, p. 427); Truckee River, 4,900 feet, near Verdi (Mus. Vert. Zool.).
 Ormsby County: no locality given (U. S. N. M.).
 Douglas County: Hornbrook [Holbrook] (Stan. Univ.).
 Elko County: Humboldt River Valley (Univ. Mich. Mus.); Cortez Mountains (Univ. Mich. Mus.); Snell Cañon, Ruby Mountains (Calif. Acad. Sci.); Harrison Pass R. S. (Mus. Vert. Zool.); west side of Ruby Lake (Mus. Vert. Zool.); 5 miles southwest of Whiterock (Mus. Vert. Zool.); 11 miles southwest of Midas (Mus. Vert. Zool.).
 Pershing County: El Dorado Cañon, 6,000 feet, West Humboldt Range (Mus. Vert. Zool.).

White Pine County: Cleveland Ranch, Spring Valley (Mus. Vert. Zool.).

Ruthven and Gaige (1915, p. 30) found a colony of yellow-bellied racers in Elko County, on a stony slope just beneath the northern peak of the Cortez Range. The snakes were very agile and rushed away to the shelter of rocks when alarmed.

Coluber flagellum frenatum (Stejneger)

Red Racer

Original description.—*Bascanion flagellum frenatum* Stejneger, North Amer. Fauna, no. 7, 1893, pp. 208–209 (Mountain Springs, Colorado Desert, San Diego County, California).

Synonyms for Nevada.—*Bascanion flagelliforme* subspecies *testaceum*, Yarrow, 1875, p. 542.

Bascanion flagellum frenatum, Richardson, 1915, p. 427.

Coluber flagellum piceus, Van Denburgh, 1922, p. 664.

Masticophis flagellum frenatus, Klauber, 1932, p. 124.

Range.—Southward from Mariposa County in California and southern Washoe County in Nevada through Lower California and to northern Sinaloa; eastward to southwestern Utah.

Occurrence in Nevada.—Nevada localities for this species are all in the southern part of the state, south of the 40th parallel. They are restricted further to levels under 5,000 feet. Specimens usually have come from the leveler parts of the valleys and deserts; evidently this snake avoids the steep slopes of mountains.

Nevada localities (Fig. 21) (15 specimens in Museum of Vertebrate Zoology).—

Washoe County: Winnemucca Lake (Van Denburgh, 1922, p. 670).
 Churchill County: Sand Springs (Mus. Vert. Zool.).
 Mineral County: Near Schurz (Mus. Vert. Zool.); west side of Walker Lake, 23½ miles northwest of Hawthorne (Mus. Vert. Zool.).
 Esmeralda County: Fish Lake (Mus. Vert. Zool.).
 Nye County: Amargosa River, 3½ miles northeast of Beatty (Mus. Vert. Zool.).
 Lincoln County: Crystal Spring (Mus. Vert. Zool.); 4 miles south of Alamo (Mus. Vert. Zool.); 1 mile west of Coyote Spring (Mus. Vert. Zool.).
 Clark County: Mesquite (Mus. Vert. Zool.); 1 mile west of Bunkerville (Mus. Vert. Zool.);

Indian Spring, 4,000 feet, Virgin Mountains (Mus. Vert. Zool.); Overton (U. S. N. M.); Kaolin (Mus. Vert. Zool.); Vegas Valley (U. S. N. M.); Las Vegas (Van Denburgh, 1922, p. 670); Garnet (Klauber, 1932, p. 124); near mouth of Virgin River (Mus. Vert. Zool.); Colorado River, 3 and 20 miles above Boulder Dam (Mus. Vert. Zool.); vicinity of Boulder City (Cowles and Bogert, 1936, p. 39); Hiko Spring, 2,000 feet (Mus. Vert. Zool.); Colorado River, 6 miles north of California boundary (Mus. Vert. Zool.).

Three red racers were obtained toward the end of May, 1932, near Crystal Spring, Pahrnagat Valley. The first one was found about 4 p. m. on May 24, in an *Atriplex* bush. It moved rapidly through the bush, keeping on the side opposite the collector (Fitch, MS) and finally coiled in the middle of the shrub, vibrating its tail and making a rattling sound among the dry leaves. When it was caught, the snake attempted to bite and it struggled violently with a rolling movement of the body in its effort to escape.

***Coluber taeniatus taeniatus* (Hallowell)**

Striped Racer

Original description.—*Leptophis taeniata* Hallowell, Proc. Acad. Nat. Sci. Phila., vol. 6, 1852, p. 181 (New Mexico west of Rio Grande).

Synonyms for Nevada.—*Bascanium taeniatum* subspecies *laterale*, Yarrow, 1875, p. 543.

Bascanium taeniatum taeniatum, Yarrow, 1883, p. 112.

Bascanion taeniatum, Richardson, 1915, p. 428.

Range.—Idaho and Utah south to Mexico and from eastern margin of California and Oregon to western part of Texas.

Occurrence in Nevada.—Frequent in the valleys over most of the state, south at least to 37° 15' N., in Nye County. Localities of capture are mostly between levels of 4,000 and 6,500 feet.

Nevada localities (Fig. 21) (24 specimens in Museum of Vertebrate Zoology).—

Washoe County: Little High Rock Cañon (Mus. Vert. Zool.); 8 1/8 miles southeast of Hausen, 4,800 feet (Mus. Vert. Zool.); Fox Cañon, 6 miles south of Pahrum Peak (Mus. Vert. Zool.); Pyramid Lake (U. S. N. M.); near Reno (Univ. Kans.).

Ormsby County: Carson City (U. S. N. M.); 4 miles southwest of Carson City (Mus. Vert. Zool.).

Humboldt County: Big Creek, 5,000 feet (Mus. Vert. Zool.); Leonard Creek, 4,700 feet (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.); 5 miles southeast of Quinn River Crossing, 4,000 feet (Mus. Vert. Zool.); 6 miles east of Golconda (Mus. Vert. Zool.).

Elko County: Humboldt River Valley (Univ. Mich. Mus.); Annie Creek, Carlin (Univ. Mich. Mus.); Maggie Cañon (Univ. Mich. Mus.).

Pershing County: 5 miles east of Lovelock (Mus. Vert. Zool.); El Dorado Cañon, 6,000–8,000 feet, West Humboldt Range (Mus. Vert. Zool.).

Lander County: Kingston Creek, 6,000 feet (Mus. Vert. Zool.).

White Pine County: Antelope Springs (U. S. N. M.); near Smith Creek Cave, Mt. Moriah (Mus. Vert. Zool.).

Mineral County: Endowment Mine, Excelsior Mountains (Mus. Vert. Zool.).

Nye County: Wisconsin Creek, 6,000 feet (Mus. Vert. Zool.); North Twin River, 6,500 feet (Mus. Vert. Zool.); South Twin River, 6,500 feet (Mus. Vert. Zool.); Pablo Creek, 6,200 feet (U. S. N. M.); Cloverdale (U. S. N. M.); 1/2 mile south of Oak Spring, 5,700 feet (Mus. Vert. Zool.).

Lincoln County: North end of Timpahute Range, 5,300 feet (Mus. Vert. Zool.).

Taylor (1912, p. 353) captured four striped racers in the vicinity of the Pine Forest Mountains, Humboldt County. He observed that while these snakes did not move as rapidly as red racers, they were by no means sluggish. Two attempted to escape by climbing through a large sage bush. They fought vigorously, coiling themselves about the limbs of the bushes and resisting capture.

The stomach of one specimen obtained by Ruthven and Gaige (1915, p. 29) in Elko County, contained a whip-tailed lizard.

Fitch (MS) found a striped racer at the north end of Timpahute Range, 5,300 feet, on May 15, 1932. It was in a rocky outcrop in a small ravine, part of a coil protruding from beneath a flat rock.

***Salvadora grahamiae hexalepis* (Cope)**

Patch-nosed Snake

Original description.—*Phimothyrus hexalepis* Cope, Proc. Acad. Nat. Sci. Phila., 1866 (1867), p. 304 (Fort Whipple, Arizona).

Synonyms for Nevada.—*Salvadora hexalepis*, Van Denburgh and Slevin, 1921, p. 37.

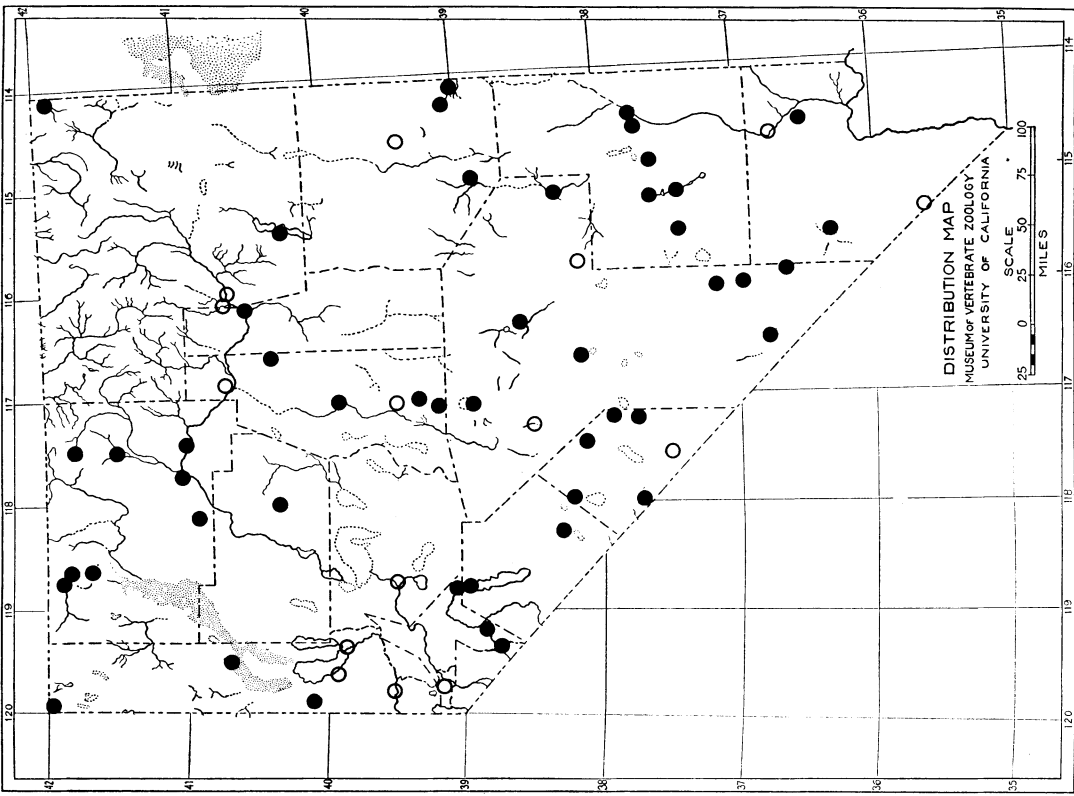


Fig. 23. Distribution of *Pituophis catenifer deserticola* in Nevada.

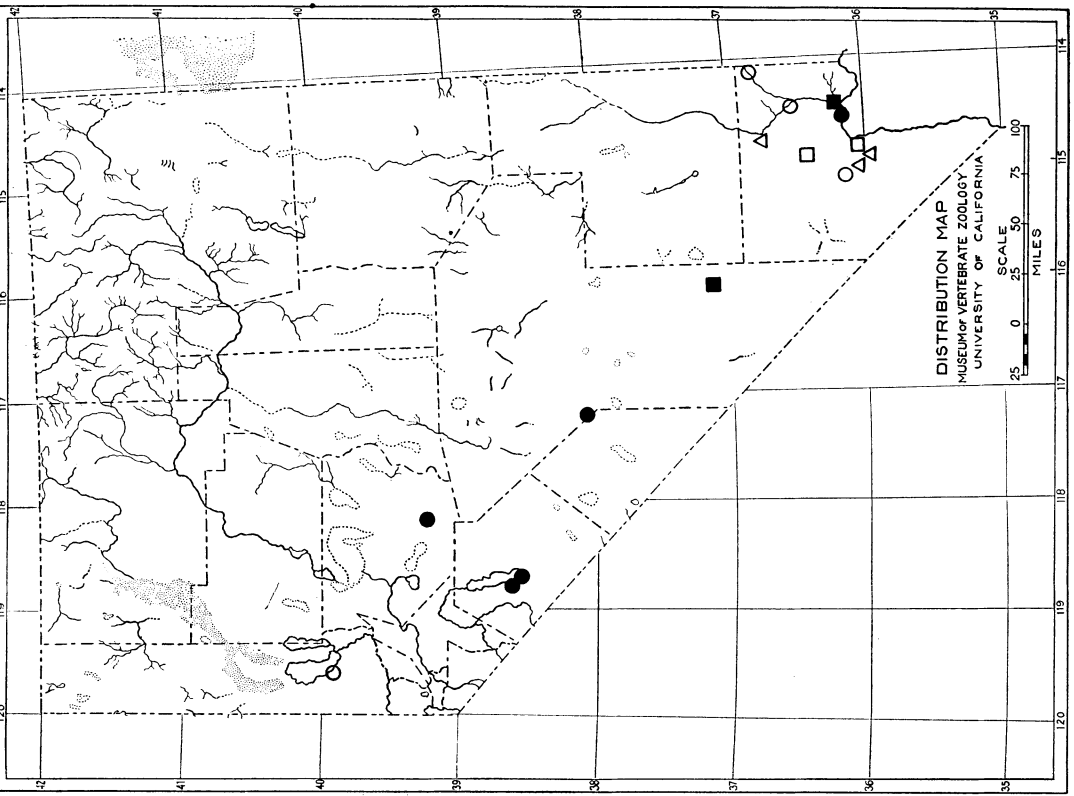


Fig. 22. Distribution of *Sabadorea grahamiae hexalepis* (circles), *Phyllorhynchus decurtatus perkinsi* (triangles), and *Arizona elegans occidentalis* (squares) in Nevada.

Salvadora grahamiae, Van Denburgh, 1897, p. 182.

Range.—Desert regions of California, Nevada, Utah, Arizona, and western Mexico; also southern Lower California and Tiburon Island (as restricted by Bogert, 1935, p. 89).

Occurrence in Nevada.—The eight record stations are all south of the 40th parallel and they range in altitude from a little below 1,500 feet up to around 6,000 feet. Two specimens in the Museum of Vertebrate Zoology were picked up dead in roads.

Nevada localities (Fig. 22) (4 specimens in Museum of Vertebrate Zoology).—

Washoe County: Sutcliffe, Pyramid Lake (Calif. Acad. Sci.).

Churchill County: 7½ miles east of Frenchman's Station (Mus. Vert. Zool.).

Mineral County: Cottonwood Creek, Mount Grant (Mus. Vert. Zool.); west side of Walker Lake, 7½ miles northwest of Hawthorne (Mus. Vert. Zool.).

Nye County: Tonopah (Mus. Vert. Zool.).

Clark County: Virgin River, near Bunkerville (U. S. N. M.); near Saint Thomas (U. S. N. M.); Las Vegas (Van Denburgh, 1922, p. 691); Colorado River, 20 miles above Boulder Dam (Mus. Vert. Zool.).

Phyllorhynchus decurtatus perkinsi

Klauber

Leaf-nosed Snake

Original description.—*Phyllorhynchus decurtatus perkinsi* Klauber, Bull. Zool. Soc. San Diego, no. 12, pp. 11–16 (Dry Lake, San Diego County, California).

Synonym for Nevada.—*Phyllorhynchus decurtatus*, Klauber, 1932, p. 125.

Range.—Southeastern California, southern Nevada and western Arizona.

Occurrence in Nevada.—So far recorded only from the vicinity of paved highways which cross Clark County. Klauber (1932, p. 125) reported that the specimen from near Glendale was found on a high, rocky mesa with sparse vegetation.

Nevada localities (Fig. 22) (No specimens in Museum of Vertebrate Zoology).—

Clark County: 10 and 15 miles southeast of Las Vegas (U. C. L. A.); 5 miles southwest of Glendale (Klauber coll.).

***Arizona elegans occidentalis* Blanchard**

Faded Snake

Original description.—*Arizona elegans occidentalis* Blanchard, Occas. Papers Mus. Zool. Univ. Mich., no. 150, 1924, p. 1 (La Jolla, San Diego County, California).

Range.—Southern California and southern Nevada south to northern Lower California and southeastern Arizona.

Occurrence in Nevada.—Present in the southern end of the state north at least to 37° 15' N. and as high as 4,400 feet. Other localities indicate presence as far south at least as Boulder City and as low as 1,000 feet.

Nevada localities (Fig. 22) (4 specimens in Museum of Vertebrate Zoology).—

Nye County: 9½ miles south of Oak Spring, 4,400 feet (Mus. Vert. Zool.).

Clark County: Garnet (Klauber, 1932, p. 125); near mouth of Virgin River (Mus. Vert. Zool.); Boulder City (Cowles and Bogert, 1936, p. 40).

Klauber (1932, p. 125) commented that in the specimens found by him at Garnet the ground color was light brown, the spots dark brown; the color seemed midway between the dark coastal specimens of California and the light individuals from the Colorado Desert.

The specimen from Nye County, was taken on May 26, 1931, half an hour before sunset, as it lay motionless on the ground beneath a desert shrub (Hall, MS).

***Pituophis catenifer deserticola* Stejneger**

Gopher Snake

Original description.—*Pituophis catenifer deserticola* Stejneger, N. Amer. Fauna, no. 7, 1893, p. 206 (Great Basin and southwestern deserts [= east slope of Beaverdam Mountains, southwestern Utah]).

Synonym for Nevada.—*Pituophis sayi bellona*, Yarrow, 1883, p. 106.

Range.—Deserts of eastern California, Nevada, and Utah, south to northeastern Lower California.

Occurrence in Nevada.—The gopher snake is the most common and most generally distributed kind of snake in Nevada. Records are numerous at altitudes up to a little over 7,000 feet. They are most frequent in the valleys between 4,000 and 6,000 feet. Although most frequent in moist situations gopher snakes are sometimes found far out on the desert several miles from water.

Nevada localities (Fig. 23) (62 specimens in Museum of Vertebrate Zoology).—

- Washoe County: 12-mile Creek, $\frac{1}{2}$ mile east of California line, 5,300 feet (Mus. Vert. Zool.); Deephole (Mus. Vert. Zool.); 3 miles northwest of Flanigan, 4,200 feet (Mus. Vert. Zool.); Sutcliffe, Pyramid Lake (Calif. Acad. Sci.; U. S. N. M.); Nixon (Stanford Univ.); 3 miles east of Reno (Univ. Mich.); Truckee River (U. S. N. M.).
- Ormsby County: Carson City (Stanford Univ.).
- Lyon County: Wellington (Mus. Vert. Zool.); between Wellington and Yerington (Mus. Vert. Zool.); 10 miles northwest of Walker Lake (Mus. Vert. Zool.).
- Humboldt County: Virgin Valley (Mus. Vert. Zool.); Thousand Creek Flat (Mus. Vert. Zool.); Big Creek (Mus. Vert. Zool.); Winnemucca (Mus. Vert. Zool.); 5 miles north of Paradise Valley (Mus. Vert. Zool.); Martin Creek R. S., Santa Rosa Mountains (Mus. Vert. Zool.); 7 miles northeast of Golconda (Mus. Vert. Zool.); 11 miles east and 1 mile north of Jungo, 4,200 feet (Mus. Vert. Zool.).
- Elko County: Goose Creek, 2 miles west of Utah line (Mus. Vert. Zool.); 5 miles southwest of Whiterock (Mus. Vert. Zool.); James Cañon (Univ. Mich.); Maggie Cañon (Univ. Mich.); Moleen Cañon (Univ. Mich.); Carlin (Calif. Acad. Sci.); South Fork Humboldt River (U. S. N. M.); 8 miles northeast of Midas (Mus. Vert. Zool.); west side of Ruby Lake, 5 miles east of Harrison Pass (Mus. Vert. Zool.).
- Pershing County: Fanning, 5,000 feet, West Humboldt Range (Mus. Vert. Zool.).
- Churchill County: Fallon (Klauber coll.).
- Lander County: 10 miles northeast of Battle Mountain (Univ. Mich.); 30 miles north of Austin (Mus. Vert. Zool.); Austin (Calif. Acad. Sci.); 10 and 15 miles northeast of Tenabo (Mus. Vert. Zool.); 2 miles north of Birch Creek Ranch, 6,000 feet (Mus. Vert. Zool.); Kingston Creek, 6,000 and 6,500 feet (Mus. Vert. Zool.).
- Eureka County: 1 mile east of Palisade (Mus. Vert. Zool.).
- White Pine County: Willard Creek, 7,150 feet, Spring Valley (Mus. Vert. Zool.); near Smith Creek Cave, Mt. Moriah (Mus. Vert. Zool.); Hendry Creek, 8 miles southeast of Mt. Moriah (Mus. Vert. Zool.); 5 miles northwest of Baker (Mus. Vert. Zool.); 3 miles southeast of Baker (Mus. Vert. Zool.); Water Cañon, 8 miles north of Lund (Mus. Vert. Zool.); Pyramont (U. S. N. M.).
- Mineral County: 3 miles south of Schurz (Mus. Vert. Zool.); Endowment Mine (Mus. Vert. Zool.).
- Esmeralda County: 22 miles southeast of Mina (Mus. Vert. Zool.); Fish Lake (Mus. Vert. Zool.); Palmetto Mountains (Stanford Univ.); 13 miles south of Tonopah (Mus. Vert. Zool.); 2 miles north of Goldfield (Mus. Vert. Zool.).
- Nye County: Peavine Creek (U. S. N. M.); Smoky Valley, 5 miles southeast of Millett P. O. (Mus. Vert. Zool.); Round Mountain (U. S. N. M.); 3 miles west of Miller's Wells (Mus. Vert. Zool.); 6 miles southeast of Carrara (Mus. Vert. Zool.); 2 miles southeast of Oak Spring, 5,500 feet (Mus. Vert. Zool.); 5 miles west of White Rock Spring, Belted Range (Mus. Vert. Zool.); 2 miles south of Yucca Pass, 3,500 feet (Mus. Vert. Zool.); White River Valley, 15 miles west-southwest of Sunnyside, 5,500 feet (Mus. Vert. Zool.); 6 miles south of Stone Cabin (Mus. Vert. Zool.); Hot Creek Valley, $6\frac{1}{2}$ miles north of Hot Creek, 5,900 feet (Mus. Vert. Zool.); $19\frac{1}{2}$ miles west of Indian Springs (Mus. Vert. Zool.).
- Lincoln County: Hiko, 4,000 feet (Mus. Vert. Zool.); 10 miles west of Caliente (Mus. Vert. Zool.); 2 miles northwest of Caliente (Mus. Vert. Zool.); 20 miles east of Crystal Spring (Mus. Vert. Zool.); 12 miles southeast of Groom Baldy (Mus. Vert. Zool.); Alamo (Mus. Vert. Zool.).
- Clark County: Glendale (Klauber, 1932, p. 125); 1 mile south of Roger's Spring, 2,000 feet, 10 miles south of Overton (Mus. Vert. Zool.); State-line Wells (Klauber, 1932, p. 125); 10 and $14\frac{1}{2}$ miles east of Charleston Park (Mus. Vert. Zool.).
- A gopher snake found by Richardson (1915, p. 427) coiled on a wood rat's nest at Pyramid Lake had eaten a ground squirrel (*Citellus mollis*). Another captured on July 9, near Carson City, contained large eggs.
- All specimens obtained in Elko County, by Ruthven and Gaige (1915, p. 31) had eaten small mammals. A large female found on July 30 contained large eggs.

Lampropeltis getulus boylii (Baird and Girard)

King Snake

Original description.—*Ophibolus Boylii* Baird and Girard, Cat. N. A. Reptiles in Smiths. Inst., pt. 1, 1853, pp. 82–83 (Eldorado County, California).

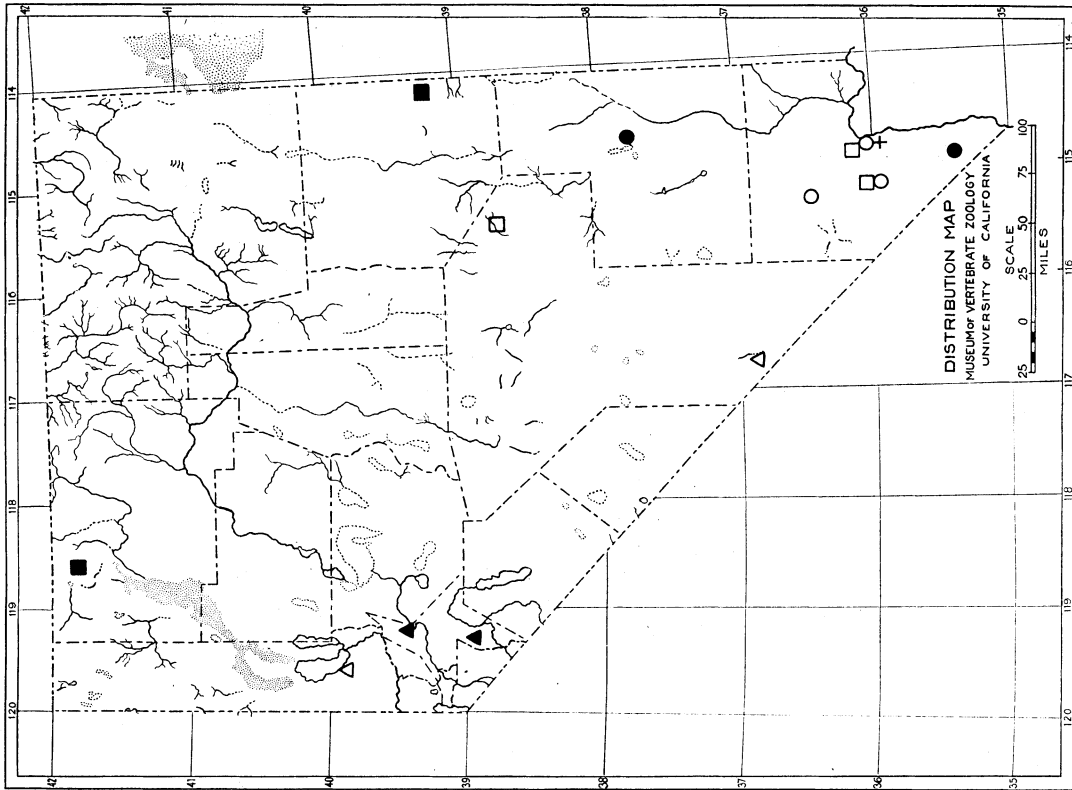


FIG. 25. Distribution of *Rhinoceros leontei* (circles), *Hypsiglena ochrorhynchus ochrorhynchus* (squares), and *Sonora semiannulata* (triangles) and *Sonora occipitalis* (cross) in Nevada.

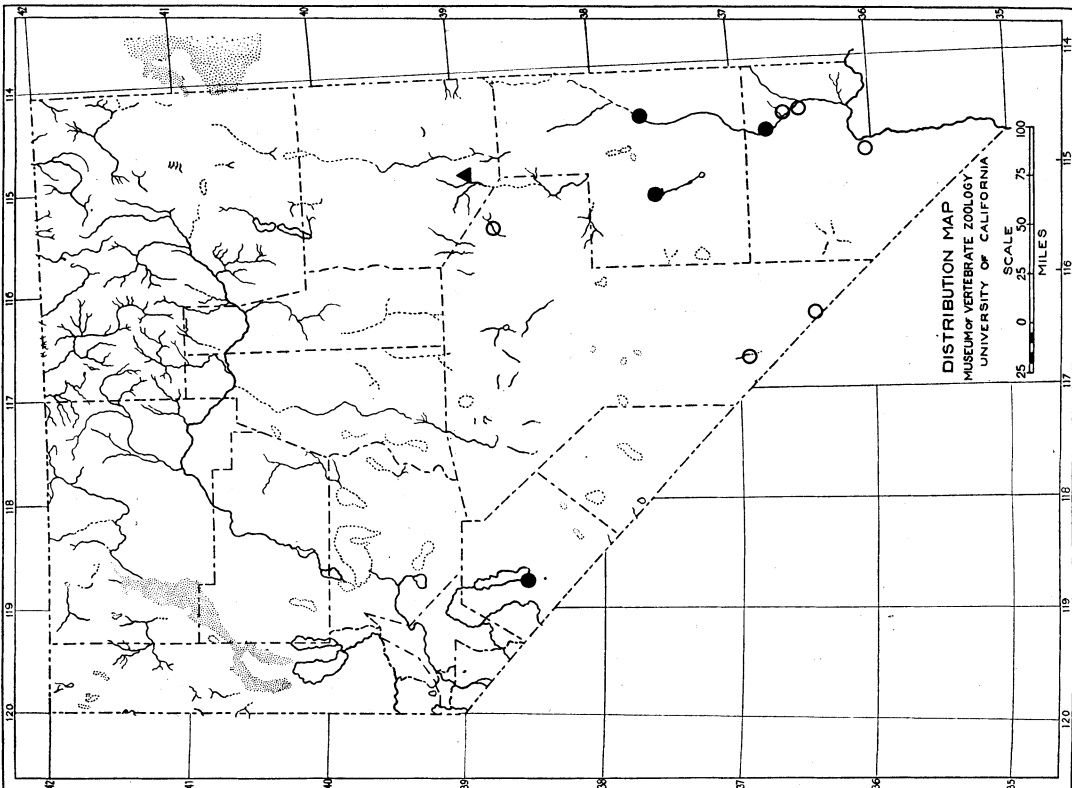


FIG. 24. Distribution of *Lampropeltis getulus boylii* (circles) and *Lampropeltis pyromelana* (triangle) in Nevada.

Synonyms for Nevada.—*Lampropeltis boylii*, Van Denburgh, 1897, p. 171.

Lampropeltis getulus californiae, Cowles and Bogert, 1936, p. 40.

Range.—This king snake has been captured at localities from Jackson County, Oregon south to Arizona and the San Joaquin Valley in California and east to southwestern Utah.

Occurrence in Nevada.—All records for this snake in Nevada are south of the 39th parallel. Three miles north of Crystal Spring, Pahrnagat Valley, Lincoln County, an individual was caught at 5 p. m. on May 18, 1932, in grass at the margin of a lake (Anderson, MS).

Nevada localities (Fig. 24) (7 specimens in Museum of Vertebrate Zoology).—

Mineral County: near Walker Lake, 5.6 miles north of Hawthorne (Mus. Vert. Zool.).

Nye County: Amargosa River, $3\frac{1}{2}$ miles northeast of Beatty (Mus. Vert. Zool.); Ash Meadows (Mus. Vert. Zool.); Currant (Van Denburgh, 1922, p. 755).

Lincoln County: 3 miles north of Crystal Spring (Mus. Vert. Zool.); Meadow Valley, 7 miles south of Caliente (Mus. Vert. Zool.).

Clark County: 1 mile north of Glendale (Mus. Vert. Zool.); Saint Thomas (U. S. N. M.); Overton (U. S. N. M.); Muddy Valley (Van Denburgh, 1922, p. 755); Boulder City (Cowles and Bogert, 1936, p. 40).

***Lampropeltis pyromelana* (Cope)**

Arizona Ringed Snake

Original description.—*Ophibolus pyromelanus* Cope, Proc. Acad. Nat. Sci. Phila., 1866, p. 305 (Fort Whipple, Arizona).

Range.—From east-central Nevada and Utah east to southwestern New Mexico and south to northern Mexico.

Occurrence in Nevada.—So far as known the two specimens (nos. 14297–98, Mus. Vert. Zool.) from Water Cañon, White Pine County, are the first ones to be obtained in this state. This station, the northwesternmost for the species, is in the northeast part of White River Valley and is on the west side of the south end of Egan Range. It is about 2 miles south of 39° N. and is practically on the line of 115° W. This is approximately 20 miles south and a little west of the town of Ely.

Nevada locality (Fig. 24) (2 specimens in Museum of Vertebrate Zoology).—

White Pine County: Water Cañon, 8 miles north of Lund (Mus. Vert. Zool.).

The two snakes listed above were captured together at 8:30 a. m. on June 12, 1932, by L. M. Boyers (MS). They were in a crevice 3 inches wide and 18 inches long, about five feet from a juniper tree, and one of many cracks in a large outcrop of irregular, broken rocks on a steep southwest-facing slope and about 200 feet above the running water in the bottom of the cañon. The snakes were side by side, one partly on top of the other, with their heads inside the crevice. Apparently this was a mating pair.

***Rhinocheilus lecontei* Baird and Girard**

Long-nosed Snake

Original description.—*Rhinocheilus Lecontei* Baird and Girard, Cat. N. A. Reptiles in Smiths. Inst., pt. 1, 1853, pp. 120–121 (San Diego, California).

Range.—This wide-ranging western species has been recorded from northern California and southern Idaho east to western Kansas south into northwestern Mexico and through Lower California.

Occurrence in Nevada.—The five specimens so far collected are from the southeastern part of the state: one locality is a few miles south of 38° N.; the other two close to 36° N. All are within 15 miles of 115° W. The northern one was taken in late afternoon on May 28, 1932, the others in April. At the Lincoln County locality the soil was gravelly and "white sage" the most abundant plant. The snake was found beneath a small desert shrub (Harville, MS).

Nevada localities (Fig. 25) (3 specimens in Museum of Vertebrate Zoology).—

Lincoln County: Desert Valley, 5,400 feet, 20 miles southwest of Pioche (Mus. Vert. Zool.).

Clark County: 15½ miles southeast of Indian Springs (Mus. Vert. Zool.); Sloan (Klauber, 1932, p. 126); Boulder City (Klauber, 1932, p. 126); 3½ miles south of Searchlight (Mus. Vert. Zool.).

Both specimens collected by Klauber (1932, p. 126) had considerable red or pink in the interspaces between the black blotches.

Hypsiglena ochrorhynchus ochrorhynchus
Cope

Spotted Night Snake

Original description.—*Hypsiglena ochrorhynchus* Cope, Proc. Acad. Nat. Sci. Phila., 1860, pp. 246–247 (Cape San Lucas, [Lower] California).

Synonym for Nevada.—*Hypsiglena ochrorhynchus*, Klauber, 1932, p. 126.

Range.—Has been captured along the Pacific coast from the San Francisco Bay region California south to the cape district of Lower California. Eastward specimens come from Nevada, Utah and Arizona and Sonora, Mexico.

Occurrence in Nevada.—Recorded from four widely scattered localities, indicating scattered distribution throughout the state. The specimen from Sloan was found crushed on the highway. It had swallowed a lizard (Klauber, 1932, p. 126).

Nevada localities (Fig. 25) (2 specimens in Museum of Vertebrate Zoology).—

Humboldt County: Virgin Valley (Mus. Vert. Zool.).

White Pine County: 2 miles west of Smith Creek Cave, Mt. Moriah (Mus. Vert. Zool.).

Nye County: Currant (Van Denburgh, 1922, p. 783).

Clark County: Sloan (Klauber, 1932, p. 126); 4 miles west of Boulder City (Cowles and Bogert, 1936, p. 41).

Sonora occipitalis (Hallowell)

Burrowing Snake

Original description.—*Rhinostoma occipitale* Hallowell, Proc. Acad. Nat. Sci. Phila., vol. 7, 1854, p. 95 (Mohave Desert, California).

Range.—Southeastern California and Arizona, and southern Nevada.

Occurrence in Nevada.—The single specimen from Boulder City, listed below, was found beneath an incinerator in a yard.

Nevada locality (Fig. 25) (No specimen in Museum of Vertebrate Zoology).—

Clark County: Boulder City (Cowles and Bogert, 1936, p. 40).

Sonora semiannulata Baird and Girard

Burrowing Snake

Original description.—*Sonora semiannulata* Baird and Girard, Cat. N. Amer. Rept., pt. 1, 1853, p. 117 (Sonora, Mexico).

Synonyms for Nevada.—*Chionactis isozonus*, Richardson, 1915, p. 426.

Contia isozona, Yarrow, 1875, p. 537.

Range.—From Idaho and western Nevada eastward to about the 97th meridian in Kansas, Oklahoma, and Texas and south into Mexico.

Occurrence in Nevada.—One specimen was obtained at each of the four localities listed below. These localities are all in the desert area near the western border of the state. The snake from Pyramid Lake was found, about June 1, 1911, beneath a rock on a rise above the southwest shore of the lake (Richardson, 1915, p. 426). The one from Ludwig, Lyon County, was picked up dead in April, 1935, in a mine shaft (A. Casting, in letter). The Rhyolite specimen was found in early August, 1913, crawling over the surface of the desert just before dark (Van Denburgh and Slevin, 1921, p. 38). These and other records for the species indicate a preference for a rocky habitat.

A burrowing snake (no. 84908, Univ. Mich.) collected on August 1, 1938, by C. L. Hubbs in Pershing County, was assigned by Stickel (1938, p. 189) to the form *Sonora miniata linearis* newly described by him.

Nevada localities (Fig. 25) (2 specimens in Museum of Vertebrate Zoology).—

Washoe County: Pyramid Lake (Stan. Univ.).

Lyon County: Ludwig Gypsum Camp, 16 miles from Yerington (Mus. Vert. Zool.); Lincoln Highway, 22 miles west of Fallon (Mus. Vert. Zool.).

Nye County: Rhyolite (Calif. Acad. Sci.).

Thamnophis ordinoides couchii (Kennicott)

Garter Snake

Original description.—*Eutaenia couchii* Kennicott, in Baird, Pac. R. R. Rep., vol. 10, 1859, Abbot's Rep., pt. 4, no. 4, pp. 10–11 (Pit River, California).

Range.—Northeastern California and western Nevada south to Kern County, California.

Occurrence in Nevada.—Known from a few localities in central-western part of the state from Pyramid Lake to West Walker River, and east to Fallon.

Nevada localities (Fig. 26) (2 specimens in Museum of Vertebrate Zoology).—

Washoe County: Pyramid Lake (Stan. Univ.); Wadsworth (Stan. Univ.); Camp 12 (= Truckee River, near Wadsworth) (U. S. N. M.);

Truckee River, 4,900 feet, near Verdi (Mus. Vert. Zool.).

Douglas County: Glenbrook (Calif. Acad. Sci.).

Lyon County: West Walker River, 4,500 feet, 10½ miles south of Yerington (Mus. Vert. Zool.).

Churchill County: Fallon (U. S. N. M.).

***Thamnophis ordinoides elegans* (Baird and Girard)**

Garter Snake

Original description.—*Eutainia elegans* Baird and Girard, Cat. N. Amer. Reptiles in Smiths. Inst., pt. 1, 1853, pp. 34–35 (Eldorado County, California).

Synonym for Nevada.—*Eutaenia elegans*, Yarrow and Henshaw, 1878, p. 1638.

Range.—Central Oregon and North Coast Ranges of California east to Warner Mountains and Sierra Nevada of Nevada and California and south through San Bernardino Mountains, California.

Occurrence in Nevada.—Localities for this garter snake are all near the central-western border of the state, between Reno and Minden and in or close to the Sierra Nevada. They range in altitude from 4,500 to 6,500 feet. All captures were made close to water.

Nevada localities (Fig. 26) (10 specimens in Museum of Vertebrate Zoology).—

Washoe County: Truckee River, 4,900 feet, near Verdi (Mus. Vert. Zool.); 8 miles southeast of Reno (Mus. Vert. Zool.); Tahoe Meadows, 8,500 feet (Mus. Vert. Zool.).

Douglas County: Glenbrook (Calif. Acad. Sci.); Minden, Carson River (Mus. Vert. Zool.); State-line, at southeast border of Lake Tahoe (Mus. Vert. Zool.).

***Thamnophis ordinoides vagrans* (Baird and Girard)**

Garter Snake

Original description.—*Eutainia vagrans* Baird and Girard, Cat. N. Amer. Reptiles in Smiths. Inst., pt. 1, 1853, p. 35 (California).

Synonyms for Nevada.—*Thamnophis ordinoi-des elegans*, Richardson, 1915, p. 429.

Eutaenia vagrans vagrans, Yarrow, 1883, p. 119.

Thamnophis vagrans, Van Denburgh, 1897, p. 211.

Range.—Eastern Washington and Oregon, and Idaho, south to Arizona and from eastern California through Nevada and Utah to Alberta, South Dakota, and Oklahoma.

Occurrence in Nevada.—This Great Basin race of garter snake occurs over most of the state, south as far as Ash Meadows and as low as 2,200 feet. It is closely restricted to the near vicinity of water—in streams, lakes and ponds, and it ranges upward in the mountains at least to 8,500 feet.

Nevada localities (Fig. 26) (102 specimens in Museum of Vertebrate Zoology).—

Washoe County: Fish Creek (Univ. Mich.); Wall Cañon (Univ. Mich.); Grass Valley Creek (Univ. Mich.); Lost Creek (Univ. Mich.); Horse Cañon Spring (Univ. Mich.); Smoke Creek, 3,900 feet (Mus. Vert. Zool.); 4 miles southwest of Diessner, 5,800 feet (Mus. Vert. Zool.); Little High Rock Creek (Mus. Vert. Zool.); Pyramid Lake (U. S. N. M.); Winnemucca Lake (Van Denburgh, 1922, p. 833); Camp 12 (= Truckee River, near Wadsworth) (U. S. N. M.).

Humboldt County: Pine Forest Mountains (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.); Virgin Valley (Mus. Vert. Zool.); Thousand Creek Flat (Mus. Vert. Zool.); 30 miles southwest of Denio (Univ. Mich.); spring at edge of Black Rock Desert (Univ. Mich.).

Elko County: Jerry Creek, Ruby Mountains (Mus. Vert. Zool.); Copper and Coon creeks (Mus. Vert. Zool.); Goose Creek (Mus. Vert. Zool.); Marys River, 23 miles north of Deeth (Mus. Vert. Zool.); Deeth (U. S. N. M.); 3 miles south of Halleck (U. S. N. M.); Elko (Calif. Acad. Sci.); Maggie Creek (Univ. Mich.); Moleen Cañon (Univ. Mich.); Ruby Lake (U. S. N. M.; Univ. Mich.); west side of Ruby Lake (Mus. Vert. Zool.); Cave Creek, Ruby Valley (Univ. Mich.); summit of Secret Pass, 6,200 feet (Mus. Vert. Zool.); Harrison Pass R. S. (Mus. Vert. Zool.); south fork of Long Creek (Mus. Vert. Zool.); Kleckner Creek (Mus. Vert. Zool.); Spring Creek (Univ. Mich.); Butte Creek (Univ. Mich.); Clover Valley (Univ. Mich.); Newark Valley (Univ. Mich.).

Churchill County: Fallon (U. S. N. M.).
Lander County: Battle Mountain (U. S. N. M.); Silver Creek (U. S. N. M.); Reese River Valley, 7 miles north of Austin (Mus. Vert. Zool.); Big Creek, Toyabe Mountains (Mus. Vert. Zool.); Kingston R. S., 7,500 feet (Mus. Vert. Zool.); Kingston Creek, 7,000 feet (Mus. Vert. Zool.).

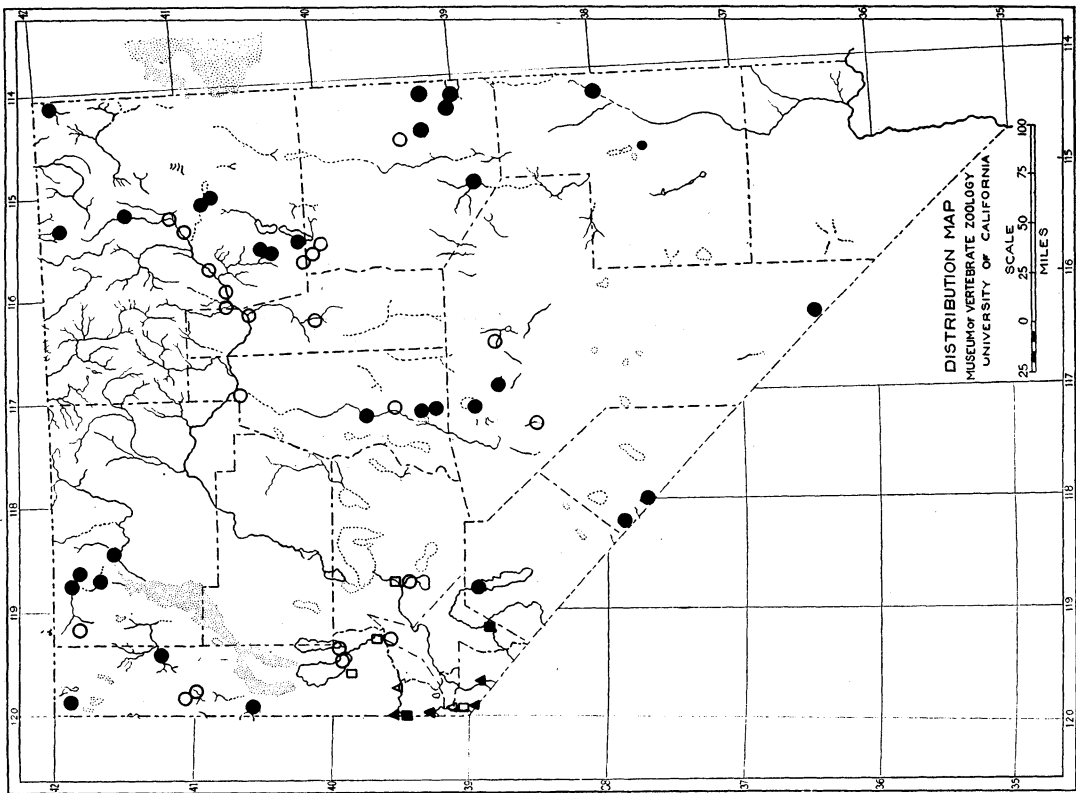


FIG. 26. Distribution of *Thamnophis ordinoides vagrans* (circles), *Thamnophis ordinoides couchii* (squares) and *Thamnophis elegans* (triangles) in Nevada.

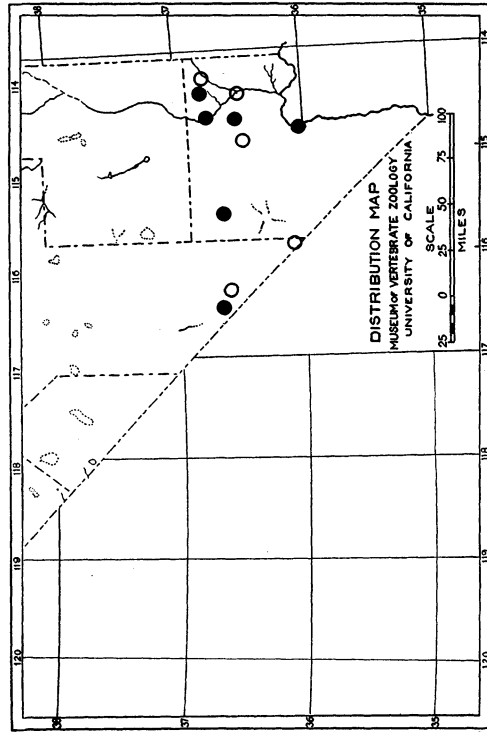


FIG. 27. Distribution of *Crotalus cerastes* in southern Nevada.

Eureka County: Palisade (Van Denburgh, 1922, p. 833); Wenzell (Mus. Vert. Zool.).

White Pine County: Summit of Overland Pass (Mus. Vert. Zool.); Willow Creek, 2 miles south of county line (Mus. Vert. Zool.); Piermont (U. S. N. M.); Cleveland Ranch, 6100 feet, Spring Valley (Mus. Vert. Zool.); Smith Creek, 7,100 feet, Mt. Moriah (Mus. Vert. Zool.); Hendry Creek, 7,800 feet, Mt. Moriah (Mus. Vert. Zool.); Snake Valley (U. S. N. M.); Willard Creek, 7,150 feet (Mus. Vert. Zool.); Baker Creek, 6,600, 7,200, and 8,400 feet (Mus. Vert. Zool.); Water Cañon, 8 miles north of Lund (Mus. Vert. Zool.); White River (Univ. Mich.).

Mineral County: 3 miles south of Schurz (Mus. Vert. Zool.).

Esmeralda County: Chiatovich Creek, 8,200 feet (Mus. Vert. Zool.); Fish Lake, 4,800 feet (Mus. Vert. Zool.).

Nye County: Smoky Valley (Calif. Acad. Sci.); Millett P. O., 5,500 feet (Mus. Vert. Zool.); 5 miles southeast of Millett P. O. (Mus. Vert. Zool.; Univ. Mich.); Peavine Creek, 6,600 feet, Toyabe Mountains (U. S. N. M.); 1 mile east of Jefferson, 7,600 feet (Mus. Vert. Zool.); Greenmonster Cañon, 8,200 feet, Monitor Mountains (Mus. Vert. Zool.); Ash Meadows (U. S. N. M.); Ballinger Ranch, Ash Meadows (Mus. Vert. Zool.).

Lincoln County: $3\frac{1}{2}$ miles north of Eagle Valley, 5,600 feet (Mus. Vert. Zool.).

In the grassy marshes along the Quinn River this garter snake was fairly common in 1909 (Taylor, 1912, p. 355). When pursued they moved rapidly and took refuge in water, in some irrigation ditch or in a pool in the river. Tadpoles were disgorged by some individuals. One, found crawling over a nest of white-crowned sparrows, was thought to be after the young birds. A female captured on July 31, at 8,400 feet, contained eggs nearly ready for hatching.

Specimens obtained at Elko in mid-July, had been eating larvae of *Rana pipiens* (Van Denburgh and Slevin, 1921, p. 38).

Ruthven and Gaige (1915, p. 32) found this garter snake to be common along the larger permanent streams in western Elko County. They considered that most of its food came from the water; one had eaten a toad, others contained fish and tadpoles. Three females gave birth to eight, ten, and twelve young on August 25, September 2, and September 10. Richardson (1915, p. 433) reported the capture in the Lahontan

basin of females containing large eggs as follows: Pyramid Lake Indian Agency, late May; Palisade, Eureka County, two on July 3 and 4. He concluded that in this area in June and July the chief food of this snake was small minnows.

Thamnophis sirtalis infernalis

(Blainville)

Garter Snake

Original description.—*Coluber infernalis* Blainville, Nouv. Ann. Mus. Nat. Hist., vol. 4, 1835, pp. [59–60] 291–292, pl. 26, figs. 3–3a (California).

Synonyms for Nevada.—*Eutaenia sirtalis sirtalis*, Yarrow, 1883, p. 123.

Eutaenia sirtalis parietalis, Yarrow, 1883, p. 125.

Eutaenia sirtalis obscura, Yarrow, 1883, p. 126.

Thamnophis sirtalis parietalis, Richardson, 1915, p. 428.

Range.—From southern Oregon to northern San Diego County, California (except northwest coastal area) and east to western Nevada.

Occurrence in Nevada.—So far known only from near the central-western border of the state—near the south end of Pyramid Lake and close to the Carson River in Douglas County.

Nevada localities (2 specimens in Museum of Vertebrate Zoology).—

Washoe County: Nixon (Van Denburgh, 1922, p. 806); Camp 12 (= Truckee River, near Wadsworth) (U. S. N. M.).

Douglas County: 2 miles north of Minden (Mus. Vert. Zool.); Carson River near Minden (Mus. Vert. Zool.); Carson Valley (U. S. N. M.).

Trimorphodon vandenburghi Klauber

Lyre Snake

Original description.—*Trimorphodon vandenburghi* Klauber, Bull. Zool. Soc. San Diego, no. 1, 1924, p. 17 (Wildwood Ranch, 1,520 feet, near Ramona, San Diego County, California).

Range.—Southern California and southern Nevada.

Occurrence in Nevada.—The single specimen from Nevada was sent to L. M. Klauber. It was found in the substation of the Southern Sierra Power Company, near Boulder Dam.

Nevada locality (No specimen in Museum of Vertebrate Zoology).—

Clark County: near Boulder Dam (Klauber coll.).

CROTALIDAE

Crotalus atrox Baird and Girard

Rattlesnake

Original description.—*Crotalus atrox* Baird and Girard, Cat. N. A. Reptiles in Smiths. Inst., pt. 1, 1853, pp. 5–6 (Indianola or San Pedro, Texas).

Synonym for Nevada.—*Crotalus cinereus*, Klauber, 1936, p. 239. This is now (Jan. 1, 1940) the accepted name for this snake.

Range.—From the Colorado Desert east to western Arkansas and the Trinity River in Texas and south into Mexico.

Occurrence in Nevada.—Known from only one locality in the state, on the plain of the Colorado River in the extreme southern tip of Clark County. Specimens were captured there on May 7 and 10, 1934, and April 22, 1936.

Nevada locality (4 specimens in Museum of Vertebrate Zoology).—

Clark County: Colorado River, opposite Fort Mojave (Mus. Vert. Zool.).

Crotalus cerastes Hallowell

Sidewinder

Original description.—*Crotalus cerastes* Hallowell, Proc. Acad. Nat. Sci. Phila., vol. 7, 1854, pp. 95–96 (Mohave Desert, California).

Range.—The deserts of southeastern California, southern Nevada, southwestern Utah, western Arizona, northwestern Sonora, and northeastern Lower California.

Occurrence in Nevada.—Frequent in the sandy deserts of Nye and Clark counties, south of 37° N. Localities extend up to 4,500 feet.

Nevada localities (Fig. 27) (6 specimens in Museum of Vertebrate Zoology).—

Nye County: Amargosa Desert (U. S. N. M.); North Amargosa, 4,500 feet (U. S. N. M.); 18 miles southeast of Beatty (Mus. Vert. Zool.); 15 miles north of Ash Meadows (U. S. N. M.); Pahrump Valley (U. S. N. M.).

Clark County: 2 miles west of Indian Springs (Mus. Vert. Zool.); Indian Spring Valley (U. S. N. M.); 1 mile north of Glendale (Mus. Vert. Zool.); Glendale (Klauber, 1932, p. 128); Mormon Mesa, 2,000 feet, 14 miles east of Glendale (Mus. Vert. Zool.); Mormon Mesa, near Virgin River (Klauber, 1932, p. 128); Dry Lake (Klauber, 1932, p. 128); Atlatl Rock, 2,000 feet, Valley of Fire (Mus. Vert. Zool.); 1 mile south of Saint Thomas (Mus. Vert. Zool.); Cottonwood Cañon (Yarrow, 1883, p. 73);

Colorado River, 3 miles above Boulder Dam (Mus. Vert. Zool.); near Boulder City (Cowles and Bogert, 1936, p. 41).

Crotalus confluentus lutosus Klauber

Rattlesnake

Original description.—*Crotalus confluentus lutosus* Klauber, Trans. San Diego Soc. Nat. Hist., vol. 6, no. 3, 1930, p. 100, pl. 10, fig. 1 (10 miles northwest of Abraham on the road to Joy, Millard County, Utah).

Synonyms for Nevada.—*Crotalus confluentus*, Yarrow, 1883, p. 77.

Crotalus lucifer, Ruthven and Gaige, 1915, p. 33.

Crotalus oregonus, Richardson, 1915, p. 433.

Crotalus oregonus, Van Denburgh, 1921, p. 38.

Crotalus viridis lutosus, Klauber, 1936, p. 242.

This is now (Jan. 1, 1940) the accepted name for this snake.

Range.—Southeastern Oregon and northern California, east of Sierra Nevada, east to 111th meridian in Utah and south in Utah and Nevada to the edge of the high plateau of the Great Basin.

Occurrence in Nevada.—Widespread over most of the plateau in the northern part of the state, south to about 38° N. in the west and 37° in the east side. Inhabits mainly the floors of the valleys; especially frequent about alfalfa fields. Also present, but less frequent, in the mountains. Found mostly at altitudes between 4,000 and 7,000 feet. Dates of capture of specimens in Museum of Vertebrate Zoology range from May 11 to September 9, and they probably represent the normal seasonal limits of activity.

Nevada localities (Fig. 28) (90 specimens in Museum of Vertebrate Zoology).—

Washoe County: 12-mile Creek, ½ mile east of California line, 5,300 feet (Mus. Vert. Zool.); Painted Point, 6,000 feet, 9 miles east of Vya (Mus. Vert. Zool.); 14½ miles north and 3½ miles east of Vya, 5,900 feet (Mus. Vert. Zool.); 2½ miles east and 11 miles north of Gerlach, 4,050 feet (Mus. Vert. Zool.); 3½ miles west of Flanigan, 4,200 feet (Mus. Vert. Zool.); Horse Cañon, 6,000 feet, Pahrump Peak (Mus. Vert. Zool.); Fox Cañon, 6 miles south of Pahrump Peak (Mus. Vert. Zool.); Pyramid Lake (U. S. N. M.); 18 miles northeast of Reno (Mus. Vert. Zool.); Truckee River (U. S. N. M.); Truckee River, 12 miles northwest of Wadsworth (Mus. Vert. Zool.).

Lyon County: 6 miles north of Fernley (Mus. Vert. Zool.); West Walker River, 12 miles south of Yerington (Mus. Vert. Zool.).

Humboldt County: Virgin Valley (Mus. Vert. Zool.); Big Creek (Mus. Vert. Zool.); near Big Creek Ranch (Mus. Vert. Zool.); Leonard Creek (Mus. Vert. Zool.); Quinn River Crossing (Mus. Vert. Zool.); Martin Creek R. S. (Mus. Vert. Zool.); 26 miles northwest of Battle Mountain (Mus. Vert. Zool.).

Elko County: Mountain City (U. S. N. M.); 8 miles south of Mountain City (Mus. Vert. Zool.); Cedar Creek, 5,600 feet, 9 miles northeast of San Jacinto (Mus. Vert. Zool.); 11 miles southwest of Midas (Mus. Vert. Zool.); Cortez Mountains (Univ. Mich.); $\frac{1}{2}$ mile west of Debbs Creek, 6,000 feet, Pilot Peak (Mus. Vert. Zool.); Harrison Pass R. S. (Mus. Vert. Zool.); west side of Ruby Lake (Mus. Vert. Zool.); between Wells and Wendover, Utah, in Nevada (Univ. Mich.).

Mineral County: Southeast side of Walker Lake, 7.6 miles north of Hawthorne (Mus. Vert. Zool.); Cottonwood Creek, 7,400 feet, Mount Grant (Mus. Vert. Zool.).

Churchill County: 5 miles west of Mountain Well (Mus. Vert. Zool.); 9 miles east of Eastgate, 6,500 feet (Mus. Vert. Zool.).

Lander County: Peterson Creek, 6,500 feet, Shoshone Mountains (Mus. Vert. Zool.); 2 miles northwest of Birch Creek Ranch, 6,000 feet (Mus. Vert. Zool.).

White Pine County: Snake Valley (U. S. N. M.); $5\frac{1}{2}$ miles southwest of Osceola (Mus. Vert. Zool.); Cherry Creek, 6,800 feet (Mus. Vert. Zool.); Deadman Creek, Hendry Creek, and 2 miles west of Smith Creek Cave, Mt. Moriah (Mus. Vert. Zool.); Water Cañon, 10 miles north of Lund (Mus. Vert. Zool.); Spring Valley, 2 miles south of Shoshone (Mus. Vert. Zool.).

Nye County: Last Chance Creek, 6,000 feet (Mus. Vert. Zool.); North Twin River, 6,500 feet (Mus. Vert. Zool.); Peavine Creek (U. S. N. M.); 12 miles north of San Antonio, 5,700 feet (Mus. Vert. Zool.); $7\frac{1}{2}$ miles east of Cliff Spring, 5,900 feet (Mus. Vert. Zool.); 2 miles northwest of Indian Spring, Belted Range (Mus. Vert. Zool.); Big Creek, 5,700 feet, Quinn Cañon Mountains (Mus. Vert. Zool.).

Lincoln County: Garden Valley (Mus. Vert. Zool.); $3\frac{1}{2}$ miles north of Eagle Valley (Mus. Vert. Zool.); Pony Spring, and $4\frac{1}{2}$ miles south (Mus. Vert. Zool.); Pahroc Valley, 24 miles

west of Caliente (Mus. Vert. Zool.); 4 miles southwest of Caliente (Mus. Vert. Zool.).

Stomachs of rattlesnakes obtained by Ruthven and Gage (1915, p. 33) in the upper Humboldt Valley contained small mammals. Females captured on July 6 and 10 contained large eggs (36 mm. long in one). Two specimens captured in Humboldt County on August 7, 1909, at an altitude of 4,300 feet were thought to be a mating pair (Taylor, 1915, p. 356).

A specimen (no. 17022, Mus. Vert. Zool.) obtained on May 24, 1934, at six miles north of Fernley, Lyon County, is considered by Klauber (in letter) to be more like *C. c. oregonus* than *C. c. lutosus* even though the latter would be expected in that area. It is a young individual and young ones show less differentiation in pattern and color than do adults. Until this occurrence is confirmed by the capture of adults, I have considered it best not to include this race in the Nevada list.

Four rattlesnakes were obtained, June 12 to 14, 1932, in Water Cañon, 10 miles north of Lund, White Pine County. One was found before sunrise on the morning of June 12, on broken rocks at the base of a cliff. It was sluggish and did not move while the collector approached and picked it up. In the evening of the same day one was obtained from among broken rocks on a steep hillside. It rattled when a person walked over the rocks under which it was hiding. A partly digested *Lagurus* was taken from its stomach. Another was found near this spot early in the morning on June 14. It was on a flat, oblique rock partly under a small bush. A dead white-footed mouse was suspended on a wire a few inches in front of the snake which rattled and moved forward, all parts of the body appearing to move simultaneously. It stopped near the mouse and bit it immediately with a short, quick motion, the head moving only two or three inches and drawing back as soon as the mouse had been struck. After a few seconds the snake approached and touched the mouse with its tongue and then moved on past it. For five minutes the snake moved restlessly within two feet of the mouse, returning several times to touch the body or move the tongue over its fur. At the end of this time the mouse was grasped by the side of the face and the swallowing commenced. This required eighteen minutes. The snake remained in a loose coil, almost motionless, while the mouse was worked in with slight movements of the jaws. Once the snake rattled in response to slight movements of the observer standing

two feet away. When rattling it made no effort to disgorge the prey. After the mouse had been engulfed, a live fence lizard was released on the rock. The snake watched it intently, the tongue far extended and motionless with the tips spread far apart and resting on a dead twig, and the head swaying slightly. It finally began to move cautiously toward the lizard which then ran through the bush and escaped. Apparently in pursuit, the snake crawled quickly about a foot in the same direction and then stopped within the bush where it climbed almost to the top two feet above the ground (Fitch, MS).

***Crotalus mitchellii pyrrhus* (Cope)**

Rattlesnake

Original description.—*Caudisona pyrrha* Cope, Proc. Acad. Nat. Sci. Phila., 1866, p. 308 (Canyon Prieto, Yavapai County, Arizona).

Range.—Southern Nevada, central and western Arizona, southern California, south to northern Lower California.

Occurrence in Nevada.—So far known only from southern Clark County in the vicinity of the Colorado River. Two specimens were obtained in May, 1936, from the vicinity of Nelson, by C. M. Bogert.

Nevada localities (Fig. 28) (No specimens in Museum of Vertebrate Zoology).—

Clark County: Nelson (U. C. L. A.).

***Crotalus mitchellii stephensi* Klauber**

Rattlesnake

Original description.—*Crotalus confluentus stephensi* Klauber, Trans. San Diego Soc. Nat. Hist., vol. 6, no. 3, 1930, p. 108 (2 miles west of Jackass Springs, 6,200 feet, Panamint Mountains, Inyo County, California).

Synonyms for Nevada.—*Crotalus confluentus lulosus* (part), Klauber, 1930, p. 102.

Crotalus tigris, Stejneger, 1893, p. 214.

Crotalus confluentus stephensi Klauber, 1930, p. 109.

Range.—From Mono County to central San Bernardino County in eastern California and eastward into western Nevada.

Occurrence in Nevada.—This race extends from southern Mineral County and the Belted Range, Nye County, southeastward to the Colorado River in the vicinity of Boulder Dam. To the south it intergrades with *C. m. pyrrhus* (Klauber, 1936, p. 163). Altitudinally, its range extends up to around 6,000 feet.

Nevada localities (Fig. 28) (7 specimens in Museum of Vertebrate Zoology).—

Mineral County: Endowment Mine, Excelsior Mountains (Mus. Vert. Zool.).

Esmeralda County: 7 miles north of Arlemont (Mus. Vert. Zool.); McAfee Ranch (Mus. Vert. Zool.); Lida (Klauber, 1936, p. 163); 7 miles south of Tonopah (*ibid.*); 1.7 miles south of Goldfield (Mus. Vert. Zool.).

Nye County: Oak Spring, Belted Range, ½ mile south, ½ mile northwest, and 4 miles southeast (Mus. Vert. Zool.); Grapevine Mountains, above Salt Wells (U. S. N. M.).

Clark County: Indian Spring Valley (U. S. N. M.); Harris Spring, 6,000 feet, Charleston Mountains (Cowles and Bogert, 1936, p. 41); Vegas Valley (U. S. N. M.); Vegas Wash (U. S. N. M.); near Las Vegas (Klauber, 1930, p. 109); Las Vegas Landing (Klauber 1932, p. 127).

***Crotalus scutulatus* (Kennicott)**

Rattlesnake

Original description.—*Caudisona scutulata* Kennicott, Proc. Acad. Nat. Sci. Phila., 1861, p. 207.

Range.—Defined by Klauber (1930, p. 54) as covering parts of Kern, Los Angeles, and San Bernardino counties in California and extending eastward through Arizona to Texas and south to northern Mexico.

Occurrence in Nevada.—Known from two localities in southern part of the state, south of 38° N. and within a few miles of 115° W., and a little more than 100 miles apart. Altitudes were close to 4,000 feet in Pahrangat Valley and 2,000 feet in the vicinity of Las Vegas.

Nevada localities (Fig. 28) (2 specimens in Museum of Vertebrate Zoology).—

Lincoln County: 3 miles southeast of Crystal Spring, Pahrangat Valley (Mus. Vert. Zool.).

Clark County: Indian Spring, 4,000 feet, Virgin Mountains (Mus. Vert. Zool.); 12 miles south of Las Vegas (Klauber, 1932, p. 127).

Subclass Synapsida

Order **Testudinata**

TESTUDINIDAE

***Gopherus agassizii* (Cooper)**

Desert Tortoise

Original description.—*Xerobates agassizii* Cooper, Proc. Calif. Acad. Sci., vol. 2, 1863, pp.

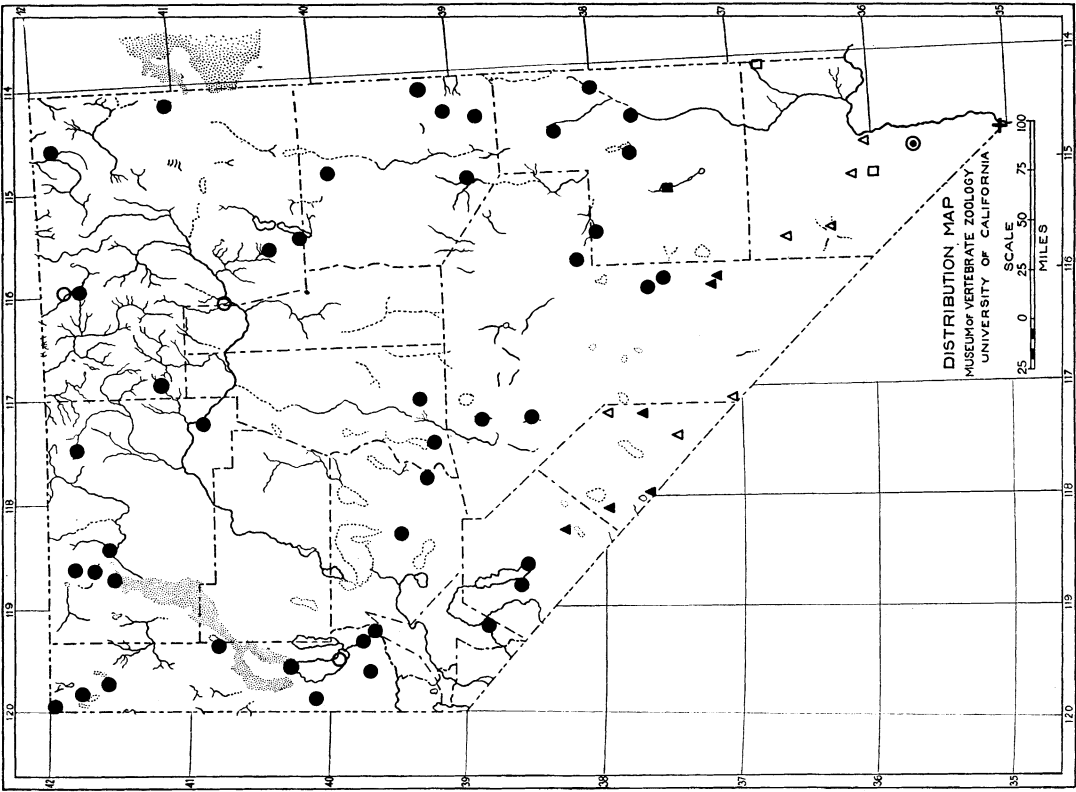


Fig. 28. Distribution of *Crotalus confluentus lutosus* (circles), *Crotalus scutulatus* (squares), *Crotalus mitchellii stephensi* (triangles), *Crotalus mitchellii pyrrhus* (dot in circle), and *Crotalus atrox* (cross) in Nevada.

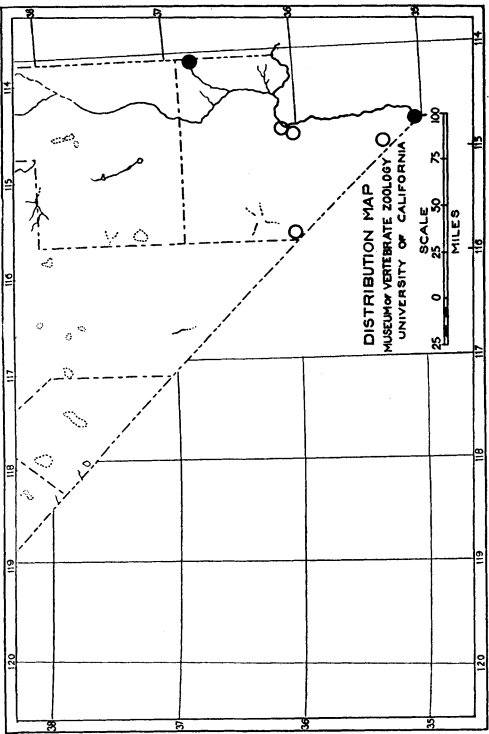


Fig. 29. Distribution of *Gopherus agassizii* in southern Nevada.

120-121 (Mountains of California near Fort Mohave [= Salado Valley, on Mohave Desert]).

Range.—Deserts of southeastern California, southern Nevada and Utah, southwestern Arizona, south into Sonora. Also on Tiburon Island, Lower California.

Occurrence in Nevada.—All records are in southern Clark County, south and east of Pah-rump Valley, which is crossed by the 36th parallel. The species doubtless occupies a larger portion of the state than this, for it has been captured in southwestern Utah and north in California to Death Valley. Nevada localities range up to 3,000 feet. Tortoises are found widely scattered over the desert on flat sandy or gravelly ground.

Nevada localities (Fig. 29) (4 specimens in Museum of Vertebrate Zoology).—

Clark County: 4 miles south of Mesquite, 3,000 feet (Mus. Vert. Zool.); Pah-rump Valley (U. S. N. M.); near Boulder City (Cowles and Bogert, 1936, p. 42); bend of the Colorado River (U. S. N. M.); Piute Valley, 10 miles south of Searchlight (Klauber, 1932, p. 128); 3 miles northwest of Fort Mojave (Mus. Vert. Zool.); Dead Mountains, 1,000 feet, 114° 40' W., 35° 5' N. (Mus. Vert. Zool.).

TRIONYCHIDAE

Trionyx emoryi (Agassiz)

Soft-shelled Turtle

Original description.—*Aspidonectes Emoryi* Agassiz, Contr. Nat. Hist. U. S., vol. 1, 1857, p. 407 (Rio Grande, near Brownsville, Texas).

Range.—Drainage of the Rio Grande in Texas and north to Oklahoma and Arkansas; recently reported from lower Colorado River drainage in Nevada, Arizona, California, and Lower California, but not known to be native in this region.

Occurrence in Nevada.—Present in the Colorado River, apparently for the whole distance it borders southern Nevada. Reported by Cowles and Bogert (1936, p. 42) from the vicinity of Boulder Lake. Commonly caught by fishermen near the California line.

Nevada localities (1 specimen in Museum of Vertebrate Zoology).—

Clark County: Colorado River, 6 miles north of California line (Mus. Vert. Zool.).

GENERAL COMMENT

In this report 63 kinds of amphibians (16) and reptiles (47) are considered, on the basis of specimens examined, to be inhabitants of the state of Nevada. In this lot 56 full species are represented; the only ones having more than one race in this area are as follows: *Bufo boreas* (3), *Callisaurus draconoides* (2), *Uta stansburiana* (2), *Thamnophis ordinoides* (3), and *Crotalus mitchellii* (2). Species recorded that probably have been introduced to Nevada territory by man are *Rana aurora draytonii*, *R. catesbeiana*, *R. pipiens* (part), and *Trionyx emoryi*. One species (*Diadophis amabilis*) reported from the Kingsbury Grade, a few miles from Carson City, Ormsby County, Nevada, by C. P. Russell (Yosemite Nature Notes, vol. 7, 1928, p. 67) was omitted because no specimen was available for verification.

Because of the extremes of dryness reached, the occurrence of amphibians over the whole area is rather discontinuous. This is especially true toward the south end of the state where there are many colonies of amphibians at springs and short streams, surrounded by wide stretches of desert unsuitable for these animals. Apparently this factor of isolation has preserved several colonies of toads and frogs sufficiently distinct from their nearest relatives to deserve recognition by name systematically. Moreover, possibly on account of the higher temperatures and its general location, this southern end of the state has more kinds of amphibians than the northern end. No salamanders have been found in Nevada, but several species may occur and search should be made for them about the mountain lakes. *Bufo alvarius* and *Hyla arenicolor* have been reported close to the borders and they probably occur within the state near its southern tip.

The lizards and snakes are, as a rule, less closely restricted to the immediate vicinity of water than the amphibians, and their ranges are more nearly continuous in Nevada. But these animals are closely adapted to certain types of ground and to other elements in their environment and they vary greatly in density of population. Nearly all the kinds represented reach limits of their ranges somewhere in Nevada. The limiting factor, most often effective in determining this limitation here, appears to be change in air temperature. Additional kinds of reptiles which seem likely to be discovered in Nevada are members of the genus *Gerrhonotus*, and snakes of the genera *Leptotyphlops*, *Diadophis*, *Chilomeniscus*, *Thamnophis*, and *Tantilla*.

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