

Catalogue of American Amphibians and Reptiles.

JONES, K. BRUCE. 1985. *Eumeces gilberti*.

Eumeces gilberti Van Denburgh
Gilbert's Skink

Eumeces gilberti: Van Denburgh, 1896:350. Type-locality, "Yosemite Valley, Mariposa County, California." Holotype, California Acad. Sci.-Stanford Univ. 4139, collected by Charles H. Gilbert and James M. Hyde on 10-15 June 1896 (not examined by author).

Eumeces skiltonianus: Cope, 1900:643 (part, by inference).

Eumeces skiltonianus: Camp, 1916:72-73 (part).

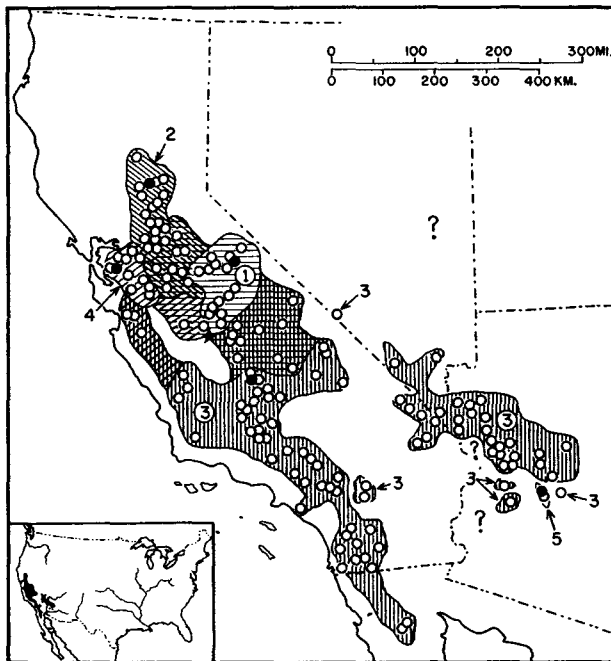
Plestiodon skiltonianum: Grinnell and Camp, 1917:175, 176 (part).

Eumeces gilberti: Taylor, 1935:438. Resurrected name.

• CONTENT. Five subspecies are recognized: *gilberti*, *cancellosus*, *placensis*, *rubricaudatus*, and *arizonensis*.

• DEFINITION AND DIAGNOSIS. A relatively large skink, adults average 87 mm snout-vent length (SVL), range 63-113 mm, and hatchlings 32 mm. Juveniles are striped, generally with pairs of light-colored dorsolateral lines extending from the rostral scale to the tail. Juvenile background color varies, but is generally dark brown and the tail a shade of blue or pink. Striping fades with maturity; in all subspecies except *arizonensis*, adults lose all stripes. Adult ground color may be brown, olive-brown, grayish brown, bluish gray, greenish gray or olive, with varying amounts of dark pigment superimposed. Adults may also develop orange or red coloration on their heads, especially during the breeding season. Complete or nearly complete loss of juvenile striping at 60-70 mm SVL, and adult size more than 75 mm SVL most consistently distinguish *E. gilberti* from *E. skiltonianus* in areas of sympatry. *Eumeces skiltonianus* also has scattered black melanophores clustered in groups or singly, superimposed on the ground color of the back, and usually 7 supralabials (83% with at least one side with 7 supralabials or less). *Eumeces gilberti* usually has 8 supralabials on both sides.

• DESCRIPTIONS. The holotype was described by Van Denburgh (1896). Cope (1900), Van Denburgh (1922), Taylor (1935), Smith (1946), Rodgers and Fitch (1947), and Stebbins (1954) provide details of geographic, sex, size, and color variation. Grinnell (1908) and Camp (1916) provide descriptions of California specimens.



MAP. Solid circles represent the approximate locations of type-localities. The star marks a Pleistocene fossil locality. Question marks indicate questionable localities. Open circles represent all other locality records.

Rodgers (1944) describes *E. g. placensis*, and Lowe and Shannon (1954) *E. g. arizonensis*. Stebbins (1966) and Behler and King (1979) provide brief descriptions of the species.

• ILLUSTRATIONS. Stebbins (1966) and Behler and King (1979) provide color illustrations and color photographs of juveniles and adults, respectively. Black and white photographs appear in Van Denburgh (1922), Taylor (1935), and Smith (1946). Rodgers (1944) provides a photograph of the type-specimen *E. g. placensis*. Van Denburgh (1922), Taylor (1935), Smith (1946), and Rodgers and Fitch (1947) provide black and white illustrations with the latter the most detailed.

• DISTRIBUTION. The species is distributed through central California, north approximately to the Yuba River, east through the San Joaquin Valley to the Sierra Nevada, and west to the San Francisco Bay area. Its range extends southward along the California coast (but at least 20 km inland) to San Diego, and into the chaparral vegetation association of the San Pedro Martir of Baja California. In the Mohave and Sonoran deserts of southern Nevada, eastern California and central and northwestern Arizona, populations of *E. g. rubricaudatus* are disjunct and restricted to mountains with pinyon-juniper and chaparral, generally above 1200 m, or riparian woodland. *Eumeces g. arizonensis* is restricted to cottonwood-willow riparian woodland on the Hassayampa River near Wickenburg, Arizona. Stebbins (1966) provides distribution maps of all five subspecies and Stebbins (1954) and Behler and King (1979) describe subspecific distributions.

• FOSSIL RECORD. Brattstrom (1953) reported a probable *E. gilberti* from Pleistocene deposits at the southern end of the San Joaquin Valley, Kern County, California.

• PERTINENT LITERATURE. Rodgers and Fitch (1947) provide the most comprehensive taxonomic review of subspecies in *E. gilberti* (although *arizonensis* was described later), and a complete review of literature prior to 1946. Details of life histories, ecology, and habitat associations are in Van Denburgh (1896, 1897, 1922), Grinnell (1908), Klauber (1939), Smith (1946), Rodgers and Fitch (1947), Brattstrom (1953), Lowe and Shannon (1954), Gates (1957), Roest (1959), Banta (1962), Milstead (1965), Stebbins (1966), Montanucci (1968), Lowe (1972), Verner and Boss (1980), Jones (1981a, 1981b), Jones et al. (1982), Short (1983), Jones et al. (1985), and Jones and Glinski (1985). Clutch and egg size (subspecies not identified) were reported by Punzo (1982), and adaptive strategies and tail autotomy by Vitt et al. (1977). Chromosome and tissue analysis of *E. gilberti* has been performed by Deweese and Wright (1970) and Miller (1974), respectively. Banta (1957), Milstead (1965), Jones (1981a and 1981b), Jones et al. (1985), and Jones and Glinski (1985) report success in pit-fall trapping this lizard. Distributional information is in Van Denburgh (1896, 1897, 1922), Cope (1900), Grinnell (1908), Atsatt (1913), Camp (1916), Grinnell and Storer (1921, 1924), Taylor (1935), Klauber (1939), Rodgers (1944), Smith (1946), Rodgers and Fitch (1947), Lowe and Shannon (1954), Banta (1962), Roest (1959), Montanucci (1968), Lowe (1972), Medina and Vitt (1974), Verner and Boss (1980), Jones (1981a), Jones et al. (1981), Jones et al. (1982), Buus (1983), Jones et al. (1985), and Jones and Glinski (1985). Milsap (1981) reported *E. gilberti* in the diet of zone-tailed hawks (*Buteo albonotatus*).

• ETYMOLOGY. The name *gilberti* honors Dr. Charles H. Gilbert, one of the collectors of the holotype; *cancellosus* (L.) is descriptive of a latticed pattern of dark markings; *placensis* refers to Placer County, California; *rubricaudatus* (L.) means "red tail"; and *arizonensis* refers to Arizona.

1. *Eumeces gilberti gilberti* Van Denburgh

Eumeces gilberti: Van Denburgh, 1896:350. See species account.
Eumeces skiltonianus brevipes: Cope, 1900:643. Type-locality, "Fresno, California." Holotype, U.S. Nat. Mus. 12558, collected by G. Eisen (not examined by author).

Plestiodon skiltonianus: Grinnell and Camp, 1917:175, 176 (part).

Eumeces gilberti gilberti: Taylor, 1935:438. First use of trinomial.

• DEFINITION. Ground color of adult brown, green, or blue-green, head of some individuals red. Juveniles have bright blue tails, the color is usually lost when lizards reach 60 mm SVL and the

striping is usually lost at 65 mm SVL. Sexual size dimorphism present, dorsal scales small (61 rows, occiput-base of tail), usually 8 supralabials, 1 pair of nuchals, and a distinct interparietal. Maximum snout-vent length 107 mm.

2. *Eumeces gilberti placerensis* Rodgers

Plestiodon skiltonianum: Grinnell and Camp, 1917:175, 176 (part).
Eumeces skiltonianus brevipes: Taylor, 1935:428 (not of Cope, 1900:643).

Eumeces gilberti placerensis: Rodgers, 1944:101. Type-locality, "6 miles east of Smartville, Nevada County, California." Holotype, Mus. Vert. Zool., Univ. California 24058, collected by H. S. Fitch on 6 May 1937 (examined by author).

• DEFINITION. Ground color of adult uniform green or brown, head occasionally red. Juveniles have bright blue tails with color lost at 60–65 mm SVL. No sexual dimorphism in size (maximum SVL 108 mm), but females tend to retain traces of color pattern on sides while males lose all pattern. Supralabials usually 7, one pair of nuchals.

3. *Eumeces gilberti rubricaudatus* Taylor

Eumeces gilberti: Grinnell, 1908:163 (part).
Plestiodon skiltonianum: Grinnell and Camp, 1917:175 (part).
Plestiodon skiltonianus: Van Denburgh, 1922:578 (part).
Eumeces gilberti rubricaudatus: Taylor, 1935:446. Type-locality, "Tehachapi Mtns, (Kern Co.), California." Holotype, California Acad. Sci. 39002, collected by J. R. Slevin, 8 April 1914 (not examined by author).

Eumeces rubricaudatus: Smith, 1946:388.

Eumeces gilberti rubricaudatus: Rodgers and Fitch, 1947:203.

• DEFINITION. Juveniles with salmon pink tails, without blue wash on the dorsal surface as in *cancellosus*, and a row of transverse bars on each scale row between dorsolateral lines. Stripes and color pattern lost at 65–70 mm SVL. Adult ground color tannish brown to olive-green, some lizards develop bright reddish-orange heads. No sexual dimorphism in size, 8 supralabials, usually 2 pairs of nuchals and maximum size 117 mm SVL.

• REMARKS. The range of *Eumeces g. rubricaudatus* is disjunct through most of eastern California, southern Nevada, and northwestern and central Arizona (see distribution map), in juniper and chaparral woodland above 1200 m, or riparian woodland directly connected to upland habitats. Examination of recent material from western and northwestern Arizona verifies that lizards inhabiting chaparral and pinyon-juniper woodland are *E. g. rubricaudatus* and not *E. g. arizonensis* as suggested by Lowe and Shannon (1954) and Gates (1957). Jones et al (1985) found *E. g. rubricaudatus* populations on mountain islands with as little as 2600 ha of chaparral woodland (Harquahala Mountains, 25 km SSW of Aguila, Arizona).

4. *Eumeces gilberti cancellosus* Rodgers and Fitch

Eumeces gilberti gilberti: Taylor, 1935:438 (part).
Eumeces gilberti cancellosus: Rodgers and Fitch, 1947:200. Type-locality, "8 mi W and 1.1 mi S of Altamont, 900 ft, Alameda County, California." Holotype, Mus. Vert. Zool., Univ. California 24034, collected by H. S. Fitch on 4 May 1937 (examined by author).

• DEFINITION. Juveniles similar to *rubricaudatus* but with blue wash on the dorsal surface of the tail, and an indistinct vertebral stripe of light brown from the base of the tail to the top of the head. Large young (55–65 mm, SVL) have barred or variegated patterns of dark pigment on the first scale rows similar to that of *rubricaudatus*, but more distinct and persistent. Adults uniform brown or greenish brown with dark pigment on tail restricted to distal ¼ of dorsal and lateral scales (lattice effect). Some males develop reddish-orange heads. Maximum size 98 mm SVL, no sexual dimorphism, 8 supralabials more often than 7, 1 or 2 nuchals, and widely rounded apical end of interparietal.

5. *Eumeces gilberti arizonensis* Lowe and Shannon

Eumeces gilberti rubricaudatus: Taylor, 1935:446 (part).

Eumeces gilberti arizonensis: Lowe and Shannon, 1954:185. Type-locality, "5 mi SE Wickenburg, Hassayampa River, Maricopa County, Arizona." Holotype, Univ. Illinois Mus. Natur. Hist. 67063, collected by Richard W. Abbuhl on 8 July 1953 (not examined by author).

• DEFINITION. Juvenile pattern and salmon pink tails are similar to those of *rubricaudatus*, but adults average smaller (76 mm SVL, range 65–85 mm), have residual light striping on head, a dark lateral line on the 4th and 5th scale rows extending from the head to the hind limbs, and transverse dark bars on scales of the two mid-dorsal rows covering up to ¾ of the scale. Adult background color brown to olive-brown, with head pale orange-brown. Most males develop bright reddish-orange heads during peak breeding periods (April–May), whereas females retain orange-brown heads. Two pairs of nuchals, 8 supralabials, and relatively large dorsal scales (average 59 rows occiput to tail base).

• REMARKS. Examination of over 50 specimens from the Hassayampa River reconfirms distinct characteristics described by Lowe and Shannon (1954). The subspecies appears to be restricted to an 18 km section of riparian woodland on the Hassayampa River near Wickenburg, Arizona. Within this area the subspecies is closely associated with large (>1 m wide and 1 m deep) organic debris heaps, consisting of logs, twigs, and leaf litter (Jones and Glinski, 1985). These debris heaps result from periodic flooding.

Although the Hassayampa River originates in pinyon-juniper and chaparral woodland of the Bradshaw Mountains, there are several kilometers (25–35) of intermittent stream with no riparian woodland. Therefore, distributions of *E. g. arizonensis* and *E. g. rubricaudatus* probably do not overlap. Further material is needed from riparian woodland habitats to complete the geographic picture of *E. g. arizonensis* in Arizona.

COMMENT

The broad intergradation zones of *E. gilberti* subspecies have led to confusion on the status of this species. Rodgers and Fitch (1947) provide an excellent discussion of subspecies distributions, but further geographic records are needed to accurately determine intergradation zones. The concern of earlier authors (Van Denburgh, 1897; Cope, 1900; Grinnell, 1908; Camp, 1916) that *E. gilberti* is actually an ontogenetic form of *skiltonianus* has not been completely resolved. Electrophoretic analyses have not yet revealed any genetic evidence that these two lizards are separate species. Specimens of the two forms 50–60 mm in snout-vent length are indistinguishable.

Although distributions of *E. gilberti* and *E. obsoletus* come into close proximity of each other in central Arizona, existing records suggest that these species are allopatric; the region represents the westernmost extension of *E. obsoletus* and the easternmost extension of *E. gilberti*. Current allopatry, and mutual exclusion, probably reflect ecological similarity of these two lizards; both species occur in chaparral woodland in central Arizona. Mechem (1980) extended the range of *Eumeces multivirgatus* from the Williams, Arizona area west to the Colorado River near Topock, Arizona, primarily on the basis of a single specimen. Exhaustive surveys conducted by the present author in the region between the Colorado River and Williams verified the presence of *E. g. rubricaudatus* only. Although Mechem's specimen has been verified as *E. multivirgatus*, it is highly unlikely that this species occurs more than a few kilometers west of Williams, Arizona (see discussion of Vitt and Ohmart, 1978).

Recent data obtained from this author's ongoing study of a population near Wickenburg, Arizona suggest that individual *E. gilberti* do not breed annually. In 1984 no males possessed reddish-orange heads. In 1985, following a wet winter, several males were observed with brightly colored, reddish-orange heads, including individuals captured in 1984.

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