

## CONFIRMATION OF THE PRESENCE OF *MICROTUS CALIFORNICUS* IN BAJA CALIFORNIA, MÉXICO

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**ABSTRACT.**—We provide a record and field observations of California vole (*Microtus californicus*) based on a specimen collected on 5 June 2013 in riparian habitat from Arroyo San Rafael, northwestern Sierra San Pedro Mártir, Baja California, México. The last known record of this species in México was in 1974. This species was suspected to be extirpated from México; however, our recent record confirms its present occurrence in this country.

**RESUMEN.**—Proveemos un registro y observaciones de campo del meteoro de California (*Microtus californicus*) con base en un espécimen recolectado el 5 de junio de 2013 en hábitat ribereño del Arroyo San Rafael, noroeste de la Sierra San Pedro Mártir, Baja California, México. El último registro conocido de esta especie fue en 1974. Esta especie se llegó a considerar extirpada en México, sin embargo nuestro registro reciente confirma su presencia actual en este país.

The California vole (*Microtus californicus*) is a medium-sized vole with light-gray vibrissae. The dorsum has tawny cinnamon fur, fading dorsolaterally. The tail is short, with dark brown above and gray below (Bailey 1900, Cudworth and Koprowski 2010). The species ranges in the Pacific Slope from Oregon to El Rosario in Baja California, with several isolated subspecies in the Mojave Desert, White Mountains, and Panamint Range in eastern California and in northern Baja California (Verts and Carraway 1998, Alvarez-Castañeda and Cortes-Calva 1999, Cudworth and Koprowski 2010). Due to extensive habitat alteration and land-use changes (i.e., conversion to agriculture and grazing) in several regions of northwest Baja California—including the Tijuana watershed, San Rafael (Ojos Negros) valley, coastal plains of San Quintín, and grasslands in the Sierra San Pedro Mártir—*M. c. grinnelli* and *M. c. huperuthrus* were believed to be extinct (Heske and Lidicker 1999). Ceballos and Navarro (1991) and Cudworth and Koprowski (2010) also suspected that the species might be extirpated from Baja California. This prompted the Mexican government to list the species as endangered (SEMARNAT 2010).

On 5 June 2013, a juvenile female *M. californicus* was found dead in a pond of the Arroyo

San Rafael, about 3 air kilometers SE of Rancho Mike's Sky (4.4 km upstream), on the northwestern foothills of the Sierra San Pedro Mártir, Baja California (31.08682 N, 115.61964 W, WGS 84; 1296 m elevation; see Fig. 1, locality 26). The specimen was collected by C.R. Mahrtdt and J.H. Valdez-Villavicencio during a herpetological survey. The collecting site has a series of lateral scour pools separated by short runs, with an average width, depth, and temperature of 4.8 m, 0.34 m, and 17 °C, respectively. Riparian vegetation is composed mainly of arroyo willow (*Salix lasiolepis*) and mule-fat (*Baccharis salicifolia*).

Specimen body and skull measurements (mm) and weight are as follows: total length 108; tail length 28; hind foot length 18; occipitonasal length 22.9; length of nasals 6.5; incisive foramen length 3.74; condilobasal length 21.9; basilar length (posterior edge of upper incisors along mid axis to anterior notch of foramen magnum) 20.63; braincase width 12.1; skull depth 10; mandible length (anterior edge of the mandible below incisors to posterior edge of the condyloid process) 11.9; mandibular toothrow length 4.4; and weight 12 g. The specimen (CVUABC-1160) was deposited in the Mammal Collection, Universidad Autónoma de Baja California, at Ensenada, Baja California, México (Fig. 2).

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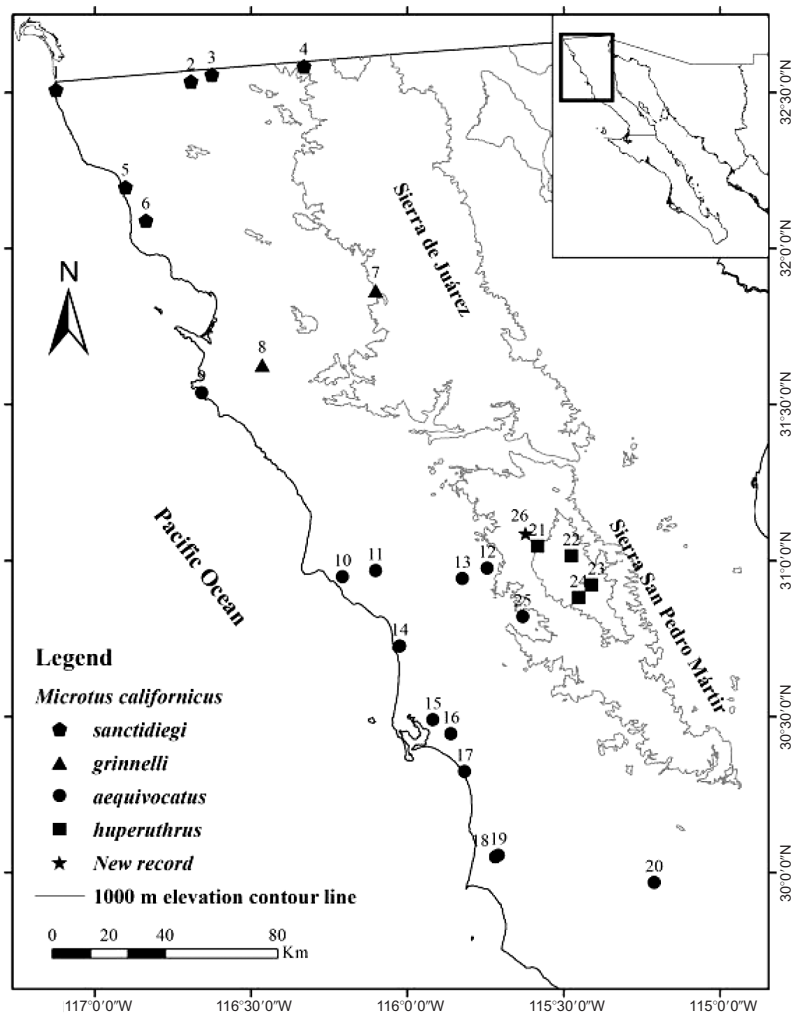


Fig. 1. Previous and recent records of 4 subspecies of *Microtus californicus* in northwestern Baja California, México (previous records obtained from Huey 1931 and VertNet 2015).

The last specimen of *M. californicus* recorded in México was taken in December 1974 from 0.5 mi. south of La Misión, Arroyo Guadalupe (= Arroyo Martínez; 32.089139 N, 116.834881 W), north of Ensenada, Baja California, and the voucher was deposited in the collection of the Museum of Vertebrate Zoology (MVZ, Mamm: 148251; VertNet 2015). This specimen was identified as *M. c. sanctidiegi* (R. Kellogg, 1918) and represents the southernmost distribution of the subspecies. However, Ramírez-Pulido et al. (2014) recognize 3 subspecies in Baja California: *M. c. aequivocatus* (Osgood 1928), *M. c. grinnelli* (Huey 1931), and *M. c. hyperuthrus* [= *hyperythrus*] (Elliot

1903). In addition, a fourth subspecies, *M. c. sanctidiegi*, is recognized by Cudworth and Koprowski (2010) as occurring in northwestern Baja California (cf. Fig. 1).

The specimen records (acquired from the literature and VertNet) indicate the presence of *M. c. sanctidiegi* in the following sites (numbers in parentheses correspond to localities shown in Fig. 1): 2 mi. south of the border at the Pacific Ocean (1), Tecate Mountain (2), Tecate Valley (3), north end of Macho Güero, Tecate (4), 26 mi. north of Ensenada (5), and 0.5 mi. south of La Misión (6). *Microtus californicus grinnelli* has only been recorded at Sangre de Cristo in the San Rafael valley (7)

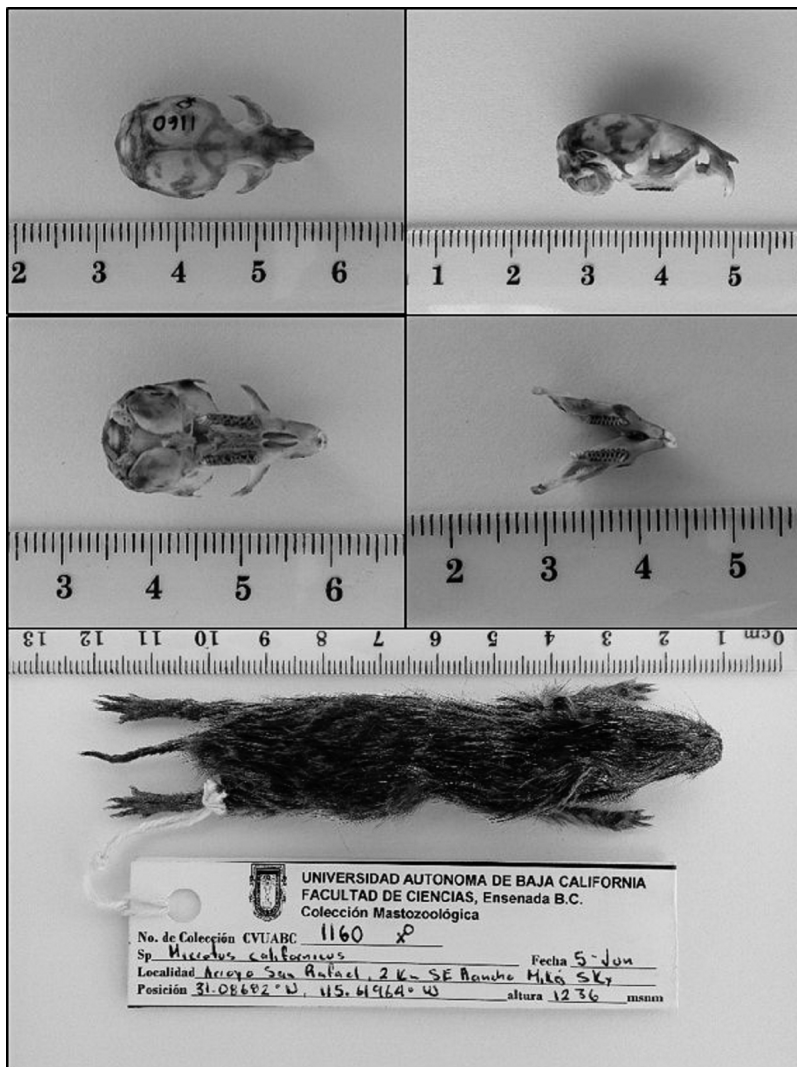


Fig. 2. Voucher specimen (skin and skull) of *Microtus californicus* (CVUABC-1160) from Arroyo San Rafael, Sierra San Pedro Mártir, Baja California, México.

(Huey 1931) and at El Rayo near Laguna Hanson in the Sierra de Juárez (8). *Microtus californicus aequivocatus* has been recorded in northwestern Baja California at the San Telmo marshes (10), San Telmo (11), San José (12), Las Cabras (13) (locations 12 and 13 obtained from Huey 1931), San Ramón at the mouth of Río Santo Domingo (14), San Quintín (15), Río San Simon (16), 15 mi. S San Quintín (17), El Rosario (18), 1 mi. E El Rosario (19), and Misión de San Fernando (20). *Microtus californicus hyperuthrus* ranges in the Sierra San Pedro Mártir, with records at

La Concepción (21), Vallecitos Meadow (22), Aguaje de Las Fresas (23), La Grulla (24), and San Antonio de Murillos (25) (Elliot 1903, Hall 1981).

Our new record confirms the presence of *M. californicus* in México, and corroborates the previous observation of Mellink and Luévano (2005), who indicated that the species might still be present in Baja California. However, the current population status of this taxon remains uncertain despite multiple expeditions to record the species (Ceballos and Navarro 1991) through systematic samplings

(Martínez-Gallardo 2011) and focused surveys at historical sites at La Grulla and Rancho Viejo meadows, both in the Sierra San Pedro Mártir (A. Guevara-Carrizales and G. Ruiz-Campos, unpublished field observations). The habitat of this species in Baja California is highly threatened due to extensive large-scale agriculture, groundwater extraction to irrigate agricultural lands, and overgrazing in mountain meadows. We recommend additional fieldwork and implementation of a management plan and a periodic monitoring program to reduce further threats to remnant populations of *M. californicus* that may exist in Baja California.

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