San Bernardino kangaroo rat, Dipodomys merriami parvus Philip V. Brylski

Description: A small, dark-colored four-toed kangaroo rat, with TL 230 to 235 mm, BL 95 mm; weight about 35 g. Dorsal pelage is dark and weakly ochreaceous with a heavy overwash of dusky. It is the only kangaroo rat found in the San Bernardino Valley, west of San Gorgonio Pass and south of Cajon Pass (see distribution). *D. m. parvus* is considerably darker and redder than *D. m. merriami*, which occurs to the north and east in the Mojave and Colorado deserts, respectively, and is darker, but not redder than *D. m. collinus*, which occurs to the south.

Taxonomic Remarks: One of the most differentiated subspecies of *D. merriami*, and may be a distinct species (Lidicker 1960). It was originally described as *D. parvus* (Rhoads 1893), and later relegated to a subspecies of *D. merriami* (Elliot 1901). *D. m. parvus* may intergrade with *D. m. merriami* through Cajon Pass to the north and with *D. m. collinus* to the south, near Menifee.

Distribution: Historically occurred in the San Bernardino and San Jacinto valleys from Cajon Wash, near Devore, east and south to Vallevista, near Hemet, and Menifee in Riverside County, and west to the vicinity of Ontario. Surveys conducted by biologists from the San Bernardino Museum of Natural History indicate that *parvus* still occurs at some historic localities, but its occurrences within this historic range have been greatly reduced by development. Current known localities include Lytle Creek Wash, Cajon Wash near Devore, Santa Ana River wash near Redlands, and Etiwanda Wash (all San Bernardino County) and Laborde Canyon in the Badlands, San Timoteo Canyon, Murrieta Hot Springs, Rimrock Reserve, and near Hemet (all Riverside County)(McKernan 1993). (see Status section for additional information.)

Life History: The results of numerous studies on *D. m. merriami* are used here to provide a general understanding of the life history of *parvus*. Detailed life history studies have not been carried out on *parvus*, although field surveys have provided information that show similarities in the ecology of *merriami* and *parvus*. Future studies on *parvus* may reveal important differences.

The species is active year-round and forages largely on seeds. Herbaceous vegetation and insects are consumed in the spring, and are important diet elements for reproduction. Year-round trapping studies of *parvus* in San Bernardino County have found pregnant females from February through October, with immatures captured from April to September (McKernan 1993 and unpubl. data). *D. m. merriami* can breed twice from spring through summer, apparently in response to favorable food supplies (seeds and herbaceous growth), although once is the norm. *D. m. parvus* probably shows a similar reproductive response, although there are no published accounts of such. Densities of from 0.3 to 18.5 individuals per ha have been recorded for *m. merriami* in creosote scrub habitats of California (Chew and Butterworth 1964, Christopher 1973, Soholt 1973). Live-trapping surveys indicate that the San Bernardino kangaroo rat is abundant in alluvial scrub habitats at some sites (e.g., Lytle Creek, Cajon, and Santa Ana River washes; R. McKernan unpubl. data; P. Brylski unpubl. data), but home range and density data are not available. Home ranges for other subspecies of *D. merriami* range from 0.3 to 19 per ha.

Habitat: Merriam kangaroo rats prefer sparse scrub habitats, and rarely occur in dense vegetation or rocky washes (Beatley 1976). *D. m. parvus* occurs in alluvial scrub/coastal sage scrub habitats on gravelly and sandy soils adjoining river and stream terraces and on alluvial fans.

Status: Class I. *D. m. parvus* is known to occur at eight localities. Four localities (Santa Ana River, Lytle and Cajon washes, and Etiwanda Creek) contain moderately large populations and four

(Badlands, Bautista Canyon, San Timoteo Creek, and San Jacinto River near Hemet) have small populations in fragmented and isolated habitat patches (R. McKernan pers. comm.). The distribution and abundance of *parvus* has dramatically declined due to the loss of alluvial scrub and coastal sage scrub habitats. Alluvial scrub habitat, where the species' reaches its highest densities, is considered an endangered habitat (Hanes et al. 1989). During the first half of this century, these habitats were reduced by agricultural development in San Bernardino and Riverside counties. Since then, habitat loss has accelerated from urban and suburban development and stream and river channelization for flood control, such as through the Santa Ana River Mainstem project. The remaining viable populations occur in the undisturbed alluvial fan sage scrub habitat along the Pacific slope of the eastern San Gabriel Mountains and western San Bernardino Mountains of San Bernardino County. The available data indicate that the populations at Reche Canyon, Jurupa Mountains, Fontana, Bloomington, and northern Colton (all in San Bernardino County), and all of the remaining Riverside County populations (Laborde Canyon in the Badlands, San Timoteo Canyon, Murrieta Hot Springs, Motte Rimrock Reserve, and near Hemet), are small, relictual populations that have persisted since development of the region and are at a high risk of extirpation.

On January 27, 1998, the U.S. Department of the Interior emergency-listed the San Bernardino kangaroo rat as Endangered (Federal Register, Emergency Rule, Vol. 63, No. 17, pp. 3835-3842, January 27, 1998). The rule stated that this taxon currently exists at only seven, widely-separated localities, and that the kangaroo rat is potentially threatened by vandalism of habitat, expansion of sand and gravel mining, and by construction of approved projects, primarily Seven Oaks Dam and levees on the Santa Ana River. [Editor's note: On September 24, 1998, the San Bernardino kangaroo rat listing as endangered was finalized.]

Management Recommendations: Providing protection for the San Bernardino kangaroo rat under CESA and FESA is the highest management priority. A similarly high priority need is to undertake habitat conservation planning efforts to define the strategies for preventing the further decline of m. *parvus.* The conservation strategies are likely to differ in San Bernardino and Riverside counties. San Bernardino County contains the most important populations and habitat, concentrated along major washes (Lytle Creek, Cajon, Etiwanda, and Santa Ana River), which are owned or leased by the tri-county (Riverside, San Bernardino, and Orange) flood control districts or, if they are privately held, are zoned as floodplain or hazard areas. The San Bernardino kangaroo rat is a target species of the Riverside County Multi-species Habitat Conservation Plan. Many of the remaining habitats in Riverside County are localized, dispersed, and in private ownership, although Riverside County also contains undisturbed alluvial floodplain habitat (e.g., San Jacinto River). To assist in defining the strategies for habitat conservation, a land use allocation study is needed to identify the ownership and zoning of occupied and potential *parvus* habitat and evaluate the importance of remaining habitat for the species' long-term conservation. Additional field surveys are needed throughout parvus' historic range, especially in undisturbed alluvial fan scrub habitats in western Riverside County (McKernan 1993). A genetic study of the systematics of parvus is needed to clarify whether its distinctive morphology (Lidicker 1960) warrants elevating the taxon to species status.

