Palm Springs pocket mouse, Perognathus longimembris bangsi Philip V. Brylski

Description: This is a small heteromyid rodent with TL from about 110 to 151 mm and weight from 8 to 11 g. As in all silky pocket mice, the pelage is spineless, and there are usually two small patches of lighter hairs at the base of the ear. Silky pocket mice can be distinguished from sympatric pocket mice of the genus *Chaetodipus (fallax, formosus, and penicillatus)* by their smaller size (see Ingles 1965 for comparisons), the absences of a tail-crest, and an unlobed antitragus in the outer ear. There is considerable variation in pelage color, from gypsum-colored at the southern limit of the subspecies' range (near Ocotillo), to buff-colored individuals in the Snowcreek area of San Gorgonio Pass, where *bangsi* intergrades with *brevinasus*.

Taxonomic Remarks: The Palm Springs pocket mouse was originally described by Mearns (1898a) from a series collected from Palm Springs, 450 ft (137 m) in elevation, Colorado Desert, Riverside County, California. The subspecies was described based on skull characteristics (not evident in live animals) and on its light colored dorsal pelage, which matches the sandy substrate of the Colorado Desert. There is considerable variation in dorsal pelage color; whether this has taxonomic implications is now being investigated (P. Brylski and J. Patton unpubl. data). *P. l. bangsi* hybridizes with the Los Angeles pocket mouse (*P. l. brevinasus*) at its western boundary. The extent of overlap and intergradation with the Jacumba pocket mouse (*P. longimembris internationalis*) to the south, and little pocket mouse (*P. longimembris longimembris)* to the north, is unknown.

Distribution: Historically known from the San Gorgonio Pass area east to southern Joshua Tree National Park, south through the Coachella Valley to Ocotillo. Its historical range extends from Joshua Tree National Park southward, west to San Gorgonio Pass and down to Borrego Springs and the east side of San Felipe Narrows (Hall 1981). Individuals captured in the vicinity of Ocotillo (P. Brylski unpubl. data, Behrends pers. comm.) are apparently also referable to *bangsi* rather than *internationalis*. The current distribution of the species in the Coachella Valley is poorly known. Populations are known from the northwestern valley and from the vicinities of the University of California reserve at Deep Canyon and Anza Borrego Desert State Park. They no longer occur on the valley floor from Palm Springs to the Salton Sea in areas developed for urban and agricultural land uses, although they may persist in pockets of native desert scrub in this area. Whether *bangsi* is continuously distributed along the western edge of the valley floor, and whether they occur along the eastern edge of the valley floor between Indio Hills and the Salton Sea, is not known.

Life History: This discussion is based on various studies of *longimembris*, including *l. longimembris* and *l. nevadensis*, the results of which are included in this discussion. Little pocket mice hibernate in winter and are active above ground in spring, summer, and fall (French 1977). Individuals awaken from hibernation periodically to forage on seeds cached in burrows, and possibly elsewhere within the species' home range. The ability to become dormant/torpid for only a few nights or for the winter enhances survival during seasonal and short-term periods of environmental stress (Kenagy 1973). The activity patterns of the Palm Spring pocket mouse are not well understood. Based on studies of related desert subspecies (*P. l. panamintinus*, French 1977; *P. l. longimembris*, Kenagy 1973), it is likely that their winter hibernation spans from about October to March. Usually, they are not found above ground during this period. Occasionally, and for reasons that are not understood, populations have been active on the surface through all or part of the winter (Kenagy 1973). Surveys for the Palm Springs pocket mouse during July and August have failed to result in captures at sites where animals were found to abundant in the subsequent spring (P. Brylski unpubl. data).

The food habits of the Palm Springs pocket mouse have not been studied. Pocket mice eat seeds,

mainly, but also green vegetation in the spring. Beatley (1969) suggested that dietary water (and vitamins), available in winter annual vegetation prior to or at the onset of the breeding season, is necessary for reproduction to occur.

P. longimembris can show dramatic fluctuations in population numbers. Hall (1946) estimated a population in Nevada to be as high as 400 individuals/acre. Chew and Butterworth (1964) recorded densities ranging from 0.85 to 1.74 individuals/ha, and home ranges from 38.7 to 84.4 m. Dodd's (1996) field surveys for *bangsi* at five locations in the northern Coachella Valley and San Gorgonio Pass region revealed major differences in the distribution and abundance of the Palm Springs pocket mouse. A maximum of 73.1 individuals/ha were recorded on one 0.48 ha grid in the Snowcreek area, and density estimates at three sites in the northwestern Coachella Valley area averaged 51.1 individuals/ha. The number of captures was significantly lower at sites east of, and including, the Whitewater Preserve. While density estimates could not be determined at these sites, they were clearly far lower than 51.1 individuals/ha.

Habitat: *P. longimembris* is known from various vegetation communities, including creosote scrub, desert scrub, and grasslands, generally occurring on loosely packed or sandy soils with sparse to moderately dense vegetative cover. Dodd's (1996) recent study showed that *bangsi* in the northern Coachella Valley was abundant in creosote-dominated desert scrub on flat to gentle slopes with sandy soils. The most common plant species where *bangsi* was abundant are *Larrea tridentata*, *Encelia farinosa*, *Ambrosia dumosa*, and *Ephedra californica*. In the same study, Palm Springs pocket mice were absent or present in low numbers in areas with compacted, stony, and cobbly soils, in saltbush (*Atriplex* sp.)-dominated communities, in areas disturbed by human habitation, and on wind-formed dunes devoid of vegetation. In 1996, the densities of Palm Springs pocket mice were highest at sites with the greatest herbaceous growth.

Status: Class II. P. l. bangsi occurs only in the Coachella Valley, where substantial agricultural and urban/suburban conversion of habitat, especially in the valley floor, has occurred over the last century. The species occurs only in native habitats, and will continue to decline in areas where soils have been compacted and vegetation degraded, as occurs in areas used by off-highway vehicles (OHVs). In a recent population survey in the northern Coachella Valley (Dodd 1996), six survey sites in native habitat each showed evidence of increasing human encroachment, and all sites, including the preserves, showed the soil and vegetation impacts of extensive OHV activity. The existing protected areas of the northern Coachella Valley where *bangsi* occurs include the Coachella Valley Preserve System (including Coachella Valley Preserve, Whitewater Preserve, and a portion of Edom Hill/Willow Hole Preserve), established primarily for conservation of the Endangered Coachella Valley fringe-toed lizard, and the southern part of Joshua Tree National Park. Dodd's (1996) surveys of these areas (excluding Joshua Tree National Park), found low densities of bangsi in 1995. While these areas contribute to *bangsi* conservation, they do not appear to contain the habitat needed to support *bangsi* population centers of the northern Coachella Valley. These population centers are currently found outside of existing protected areas, and are under development pressure. In the southern valley, *bangsi* occurs in Anza Borrego Desert State Park, probably in good numbers. Development of the valley floor appears to have fragmented the historic population into disjunct northern and southern valley populations centered in the Whitewater/San Gorgonio Pass and Anza Borrego regions, respectively.

Management Recommendations: The preservation of remaining habitat is the highest priority for the conservation of the Palm Springs pocket mouse. The species is most abundant in native desert scrub on sandy soils, the combination of which is often lacking on the margins of its historic range. While there is sufficient open space in these marginal areas, *bangsi* may be absent from them or

present at low densities. Field studies started by Dodd (1996) on its distribution, abundance, and habitat relations should be continued, to guide conservation planning efforts now underway in the Coachella Valley. *P. l. bangsi* should be a priority target species in the Coachella Valley Multi-Species Habitat Conservation (MSHCP) effort, now underway. [Editor's note: The final draft of the Coachella Valley Multi-Species Habitat Conservation plan was being considered for approval in late September 2007. The Palm Springs pocket mouse is a species covered by the plan.] It is important to know whether populations along the western edge of the valley floor are connected through movements of individuals, or whether they are disjunct and functionally independent. The ongoing Coachella Valley MHCP effort should identify this issue of habitat connectedness and fragmentation as basic to long-term conservation planning of *bangsi* and other valley species whose wide fluctuations in numbers play an important role in metapopulation dynamics. The Coachella Valley MHCP should include a plan designed to prohibit OHV recreation from areas of high habitat quality, and monitor compliance.

