

# POPULATION STATUS OF THE SHORT-NOSED KANGAROO RAT ON THE CARRIZO PLAIN NATURAL AREA, CALIFORNIA

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**Abstract:** Populations of the short-nosed kangaroo rat (*Dipodomys nitratooides brevinasus*) have declined because of habitat degradation and loss. One of the few areas where it was believed secure from these threats was the Carrizo Plain, San Luis Obispo county, California. However, at that location the numbers of short-nosed kangaroo rats have drastically declined and extant colonies are vulnerable to demographic and environmental stochasticities. Colonies are ephemeral, sex-biased and have little chance of recolonization if they become locally extinct. Surveys to locate unknown extant colonies in the Temblor mountains are recommended.

The San Joaquin kangaroo rat, *Dipodomys nitratooides*, was once common throughout the southern San Joaquin Valley (Williams 1986). It generally inhabits flat or gently sloping terrain with alkaline soil and moderate shrub cover (Culbertson 1946, Williams 1986). However, land conversion to cultivated agriculture destroyed or degraded extensive portions of this habitat type and by the early 1980's many colonies had declined or been extirpated. This destruction resulted in the federal and state governments listing two subspecies, the Fresno kangaroo rat (*D. n. exilis*) and the Tipton kangaroo rat (*D. n. nitratooides*), as endangered. The U.S. Fish and Wildlife Service recognized the third subspecies, the short-nosed kangaroo rat, as a Category 2 candidate for listing in 1981, and California included it as a Species of Special Concern in 1985 (Williams 1986).

Higher priority listings were not deemed necessary for the short-nosed kangaroo rat, as viable populations were believed to persist on the Carrizo Plain in eastern San Luis Obispo county, and on adjacent federally owned land in western Kern county (Williams 1986). These lands comprise approximately 1/3 of the remaining undisturbed habitat within the range of this subspecies; almost all of the rest of its habitat is privately owned and remains susceptible to destruction (Williams 1986).

It was believed that healthy populations of short-nosed kangaroo rats would be found on the Carrizo Plain because of the presence of large areas of alkali flats dominated by spiny saltbush (*Atriplex spinifera*) (Williams 1986). These shrub-covered flats surround an alkaline evaporative basin (Soda Lake), and are located approximately 22 km south of Highway 58. Previous research also suggested that the short-nosed kangaroo rat was locally common on what is now the Carrizo Plain Natural Area (CPNA). A 1971 study of pellets collected at a site 10 km south of Soda Lake found that short-nosed kangaroo rats represented 40% of the diet of barn owls (*Tyto alba*) (Schwartz and Bleich 1985). Short-nosed

kangaroo rats comprised 30% of the animals that were livetrapped at this site (Schwartz and Bleich 1985). Braun (1985) captured them on the eastern side of the plain in 1981, approximately 8 km east of Soda Lake. Additionally, D. Williams (pers. comm.) located a colony approximately 19 km south of Soda Lake in 1979.

Preliminary livetrapping in July 1990 to locate colonies for further study indicated that short-nosed kangaroo rats were uncommon. Therefore, in August and September 1990 and in 1991 we expanded and intensified our search to locate, quantify and monitor extant short-nosed kangaroo rat colonies on the Carrizo Plain Natural Area.

## STUDY AREA

The Carrizo Plain Natural Area in eastern San Luis Obispo county, California, encompasses approximately 77,000 ha of California annual grassland. The climate is considered to be Mediterranean, with hot, dry summers (May-October) and cool wet winters (November-April) (Huenecke 1989). Precipitation ranges from 2.5 to 25 cm, and occurs primarily as winter rains. However, during 1986-1991, and therefore throughout this study, the area suffered a severe drought, with precipitation of 5.0 cm and 16.5 cm measured in 1990 and 1991 respectively (pers. obs.).

The vegetation of the CPNA is primarily non-native grassland dominated by introduced plants such as filaree (*Erodium cicutarium*) and grasses such as *Bromus rubens*. Large areas were farmed until 1988 and were replaced by fallow fields dominated by Russian thistle (*Salsola kali*). Shrub cover is limited to the saltbush-dominated alkali flats surrounding Soda Lake and a few upland sites where common saltbush (*A. polycarpa*) is present.

In addition to the short-nosed kangaroo rat, two other species of kangaroo rat are also present on the Carrizo Plain. The giant kangaroo rat (*D. ingens*) and Heermann's kangaroo rat (*D. heermanni*) are found





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