

FIVE-YEAR STATUS REPORT

- I. COMMON NAME: Giant Kangaroo Rat
SCIENTIFIC NAME: Dipodomys ingens
CURRENT CLASSIFICATION: Endangered
- II. RECOMMENDED ACTION:

Retain Endangered classification
- III. SUMMARY OF REASONS FOR RECOMMENDED ACTION:

The historic range of the Giant Kangaroo Rat has been greatly reduced by agricultural expansion and other forms of development. Remaining populations of this animal are small and widely scattered making them vulnerable to a variety of threats. Pesticides, continued conversion of remnant habitats, and catastrophic events such as floods and fires could result in eventual extinction of the species. While habitat loss is the most serious threat to the continued viability of the Giant Kangaroo Rat, application of rodenticides within its range could have a devastating impact on small populations. Chemicals can impact Giant Kangaroo Rat populations through direct poisoning mortality. Although much of the existing evidence is circumstantial there have been instances of the rapid disappearance of Giant Kangaroo Rat populations in areas suspected or known to have had active rodent poisoning campaigns (Williams pers. comm.). In most cases the "target" animal is the California Ground Squirrel (Spermophilus beecheyi); however, there is evidence that direct eradication of kangaroo rats has been attempted because they are believed to seriously compete with cattle for forage.

- IV. NATURE AND DEGREE OF THREAT:

Historically, Giant Kangaroo Rat populations ranged from southern Merced County southward through the San Joaquin Valley to southwestern Kern County and northern Santa Barbara (Hall 1981). Recent status surveys (Williams 1981, 1985) found significant populations in only a few locations near the southern edge of the original range. Conversion of native grassland and shrub habitat to intensive agriculture has been the principal cause of the decline of this species. Fragmentation of habitat isolates populations making them susceptible to catastrophic events and potentially deleterious genetic problems such as inbreeding and genetic drift. In addition, agriculturally productive lands such as the southern San Joaquin Valley are areas of massive application of pesticides and rodenticides. Lastly, the impact of intensive livestock grazing on the species is poorly understood. While some grazing may be beneficial, intensive grazing may have serious negative effects.

- V. HISTORIC AND CURRENT DISTRIBUTION:

Historic

It is difficult to determine the total historical extent of the area occupied by the Giant Kangaroo Rat due to the spotty distribution of colonies (Grinnell 1932). However, an area can be estimated based on

the distribution of records prior to the cultivation of much of what was Giant Kangaroo Rat habitat; this was approximately 527,600 ha (1,303,700 ac) (Williams in prep). Fifty percent of this area may have been unsuitable for permanent populations of Giant Kangaroo Rats to persist except during years of favorable weather. This historic range extended from Merced County southward to southwestern Kern, eastern San Luis Obispo and northern Santa Barbara counties.

Populations of Giant Kangaroo Rats were most numerous in areas with very sparse vegetation and low annual precipitation (Grinnell 1932, Hawbecker 1951). Heavy grazing by livestock was not unusual within the range of the species (Grinnell 1932).

Current

Between about 1972 and 1980 virtually all of the land inhabited by Giant Kangaroo Rats was converted from native plant communities to cultivated agriculture, the primary impetus being the completion of the water-delivery structures of the California Water Project and the related Central Valley Project. Although accurate year-by-year data on land conversions are not available, the history of cultivation of the western Tulare Basin (formerly a Giant Kangaroo Rat stronghold) indicates that the great majority of these lands were converted between 1974 and 1979 with perhaps over half converted after 1975. As of 1985 the distribution of the remaining populations of Giant Kangaroo Rats following the period of massive habitat loss in the mid-to late-seventies was greatly restricted.

In Fresno and San Benito Counties only a single viable colony of 121 ha (300 ac) was known to exist. Other smaller colonies exist, but consist of from a few to less than 50 animals. In Kings County only a single extant colony was known from the southern Kettleman Hills. This colony encompassed an area of about 0.8 to 1.2 ha (2 to 3 ac), down from an estimated 20 ha (50 ac) in 1979.

In Kern County most known colonies of Giant Kangaroo Rats were located in the vicinity of Elk Hills Naval Petroleum Reserve and adjacent areas around McKittrick, Taft, and Maricopa. Colonies in the area occupied about 6 or 7 sections but it is difficult to gain precise measurements due to restricted access onto the Naval Petroleum Reserves.

In San Luis Obispo county most colonies of Giant Kangaroo Rats were confined to the Carrizo Plain south of State highway 58, the Elkhorn Plain, and the Cuyama Valley. Williams (pers. comm.) reported the Cuyama Valley colony to be extinct based on a survey he conducted in June, 1988. There was one small colony along San Juan Creek northwest of the Carrizo Plain and one colony on the Carrizo Plain north of highway 58.

The huge colonies described in the early literature prior to widespread cultivation of the southern San Joaquin Valley no longer exist. The loss of habitat to agricultural conversion may be as much as 97-98%. Only about 5 relatively small areas totaling about 19 sq km (12 sq mi) remain that support population densities approaching those described as typical prior to 1950 (Williams in prep.).

VI. HISTORIC AND CURRENT ABUNDANCE:

Population abundance in historic times can only be inferred based on what is known about the distribution of populations prior to cultivation of most of Giant Kangaroo Rat habitats in recent decades. Because habitats vary in quality it is not possible to directly infer that a 97% loss in habitat necessarily translates into a 97% loss in population today. However, it seems reasonable that dramatic loss of habitats resulted in a catastrophic loss of population as well. In fact, few areas that currently support populations of Giant Kangaroo Rats could be described as prime or pristine. Several areas have heavy cattle grazing and are subject to periodic flooding and applications of pesticides, including rodenticides. Good populations of Giant Kangaroo Rats have been documented on the Department's Elkhorn Plain Ecological Reserve (Williams in prep.). Here, the density of 40 individuals per ha (16 per ac) is similar to that estimated by early research (Williams pers. comm.). Grinnell (1932) reported densities based on burrow counts that were slightly higher (52/ha; 21/ac) but possibly not as accurate as Williams' live-trapping results.

VII. SPECIES DESCRIPTION AND BIOLOGY:

Giant Kangaroo Rats are small mammals with specialized elongated hind legs for hopping and external cheek pouches for transportation of food (principally grass seeds) to their burrows. The Giant Kangaroo Rat, as the name implies, is the largest of all kangaroo rats. Weights of 131 to 180 grams (4.6 to 6.4 ounces) are typical with males tending to be slightly heavier than females. Total length ranges from 311 to 348 mm (12.2 to 13.7 inches). Tail length is 157 to 198 mm (6.2 to 7.8 inches), and the hind foot ranges from 46 to 55 mm (1.8 to 2.2 inches). The presence of five toes on the hind foot is diagnostic in conjunction with size and weight of this species. Other sympatric species of kangaroo rats weigh less as adults and have four toes on the hind feet. Other distinguishing features of the species include short ears and tail (relative to head and body length) and a broad width across the maxillary processes of the zygomatic arches of the skull (Hall 1981). The general coloration is sandy brown dorsally and along the sides with white ventral parts. Giant Kangaroo Rats inhabit a precinct that averages about 6.1 m (20 feet) in diameter where a shallow burrow system (about 30.5 cm; 12 inches deep) is constructed. Each rat maintains an individual territory in a colonial arrangement consisting of from two to thousands of precincts.

Giant Kangaroo Rats subsist almost entirely on the seeds of annual plants (brome grasses and filaree) which they gather on their precincts. Additional unique behaviors include the harvesting, stacking, drying, and caching of grasses and forbs that form the main-stay of the Giant Kangaroo Rat diet. The action of these rodents in digging soils of their precincts may actually promote improved rain water penetration and greater plant growth thereby increasing their food supplies in the arid southern San Joaquin Valley. Hawbecker (1944) measured plant production on precincts and compared it to similar areas outside colonies. He found 5-6 times the biomass of vegetation on the precincts than on sites without populations of Giant Kangaroo Rats.

VIII. HABITAT REQUIREMENTS:

Giant Kangaroo Rats inhabit native annual grassland and shrubland communities where vegetation is sparse, soils are well drained fine sandy loams, and the slope is generally less than 10 percent (Ginnell 1932, Williams 1981). Annual precipitation is typically 127 mm (5 inches) or less. Generally, precicts are not found in areas where terrain slopes too steeply or in areas so flat that water may pool or flow during heavy rains. The habitat of Giant Kangaroo Rats generally lacks shrubs (Grinnell 1932). However, recent DFG studies at the Elkhorn Plain Ecological Reserve have documented dense populations of Giant Kangaroo Rats in habitat consisting of Arabian grass (Schismus aralsicus) and sparse stands of Ephedra (Ephedra viridis) (Williams 1988).

IX. CURRENT AND RECOMMENDED MANAGEMENT:

Since the Giant Kangaroo Rat has been listed as Endangered by the federal government and the state of California it has received some management focus to reduce impacts to its habitat and populations. This has primarily taken the form of mitigation for project induced impacts through the CEQA and NEPA environmental review process and functional equivalent processes.

Some habitat has been acquired within the range of the Giant Kangaroo Rat and it appears that such habitat preserves or reserves may be the best chance to maintain at least remnant populations of this Endangered species.

The Giant Kangaroo Rat is one of a number of federal and state Threatened and Endangered species, and other sensitive resources for which a regional Recovery Planning effort is being undertaken. State and federal agencies and the private sector are all involved in this important work.

Future management for this species should concentrate on requiring adequate mitigation/compensation for losses of native grassland and shrubland habitats. In many cases this management direction will be coordinated with efforts to preserve other Threatened, Endangered and sensitive resources. Design and acquisition of habitat preserves of sufficient size and quality will be the cornerstone of efforts to prevent further declines of the Giant Kangaroo Rat in the southern San Joaquin Valley.

Based on DFG studies at Elkhorn Plain Ecological Reserve and investigations elsewhere, certain areas of population concentration of Giant Kangaroo Rats have been identified. These areas often support other sensitive resources as well. Many of these lands have been assessed by the California Energy Commission based on a number of criteria that will aid in development of priorities for future acquisitions. Some of the lands have already been acquired and others are proposed. The Nature Conservancy and Bureau of Land Management have acquired portions of the Carrizo Plain Natural Heritage Reserve and there are plans to acquire additional lands in the Carrizo and Elkhorn

Plain area. All of these activities represent positive steps in the effort to preserve remaining populations of Giant Kangaroo Rats and other sensitive resources.

In addition to a vigorous program of habitat protection and preservation there is a need to assess fully the impact of cattle grazing and rodenticides on Giant Kangaroo Rats throughout their range in the state. Virtually all lands currently inhabited by Giant Kangaroo Rats are or have been subjected to intensive livestock grazing pressure. A DFG study at the Elkhorn Plain Ecological Reserve and adjacent BLM lands is attempting to assess the impact and role of grazing on Giant Kangaroo Rat ecology.

The California Ground Squirrel (Spermophilus beecheyi) is the target of rodent poisoning programs by private landowners supported by county and state governmental agencies. Application of rodenticides in Giant Kangaroo Rat range has the potential to decimate local populations of the species. Close coordination and cooperation between DFG, the State Department of Food and Agriculture, and County Agricultural Commissions is essential in order to identify potential areas of conflict and avoid detrimental impacts to non-target populations of wildlife such as Giant Kangaroo Rats.

X. SOURCES OF INFORMATION:

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