Giant Kangaroo Rat

Giant Kangaroo Rat (*Dipodomys ingens*)

Management Status

Heritage Status Rank: G2S2

Federal: Endangered January 5, 1987 (52 Federal Register 283)

State: Endangered October 2, 1980

Other: None

General Distribution

Historically, the range of giant kangaroo rat encompassed the western edge of the San Joaquin Valley from the Tehachapi Mountains in Kern County north to Los Banos in Merced County and west to eastern San Luis Obispo and northern Santa Barbara Counties. Scattered colonies occurred on steeper slopes and ridges in the Ciervo, Kettleman, Panoche, and Tumey Hills and in the Panoche Valley (U.S. Fish and Wildlife Service 2001). Today, giant kangaroo rat inhabits the arid southwestern edge of the San Joaquin Valley, the Carrizo and Elkhorn Plains, and the Cuyama Valley (Williams 1992).

Distribution in the Planning Area

Giant kangaroo rat's range approaches and potentially extends onto the Los Padres National Forest at the lower end of the Cuyama Valley. Although the Los Padres National Forest has conducted limited surveys in northern Santa Barbara and eastern San Luis Obispo Counties, no documented sightings of this species have been found on National Forest System lands in southern California. Forest Service modeled habitat (USDA Forest Service 2000) shows less than 2000 acres of potential habitat present on National Forest System lands. However, giant kangaroo rats could inhabit portions of the Los Padres National Forest adjacent to the Cuyama Valley (U.S. Fish and Wildlife Service 2001).

Systematics

Giant kangaroo rat is in the family Heteromyidae; 21 species are recognized in the genus *Dipodomys*. Giant kangaroo rat is the largest of all the kangaroo rats (U.S. Fish and Wildlife Service 1998). There

are no recognized subspecies.

Natural History

Habitat Requirements

Giant kangaroo rats inhabit native annual grassland and shrubland habitats on level and gently sloping ground with sandy, well-drained soils of valley floors and adjacent gentle slopes. Their habitat is vegetated with annual grasses and forbs and widely scattered desert shrubs. It occurs at elevations of approximately 280–2,800 feet (85–853 meters) but is rare above 2,400 feet (731 meters) (Williams 1996). Long-term occupancy of a site by giant kangaroo rats results in a Mima-mound topography, with burrow systems located in mounds a few to several centimeters higher than the intervening ground (Williams 1996).

Reproduction

Giant kangaroo rat has an adaptable reproductive pattern that is affected by both population density and availability of food. During times of high population density, female giant kangaroo rats have a short winter reproductive season with only one litter, and there is no breeding by young-of-the-year (U.S. Fish and Wildlife Service 1998). During times of low population density the breeding season can extend into August or September. In most years females are reproductive between December and March or April. Gestation lasts 30–35 days (U.S. Fish and Wildlife Service 1998). Litter size for this species ranges from 4–6 (Zeiner and others 1990). Under favorable conditions, some females can produce 2–3 litters per year. Young are born and reared in the burrows.

Survival

No information is available on the longevity of this species. Other species of kangaroo rat can live more than 7 years in captivity (Garrison and Best 1990). Giant kangaroo rat's ability to transport and store large quantities of food, combined with the apparent high longevity of adults with established burrow systems, probably allows this species to endure severe drought for up to 2 years without significant risk of population extinction (U.S. Fish and Wildlife Service 2001).

Dispersal

The primary time for dispersal in giant kangaroo rats appears to be following maturation of the young, approximately 11 or 12 weeks after birth (U.S. Fish and Wildlife Service 2001). In years of high population density, however, when all burrow systems are occupied, most young appear to remain in their natal burrows until opportunities to disperse arise or they are finally are driven off by the mother or siblings. Timing and extent of dispersal is variable and may be delayed in years of high population density when most or all burrow systems are occupied. Dispersal of adults with established burrow systems occurs occasionally (U.S. Fish and Wildlife Service 1998).

Daily/Seasonal Activity

Giant kangaroo rats are primarily nocturnal and are active throughout the year. They typically emerge from burrows shortly after sunset and forage on the surface until near sunrise, although most activity occurs in the first 2 hours after dark. Activity increases in the spring when seeds of annual plants are ripe and available (U.S. Fish and Wildlife Service 2001).

Diet and Foraging

Giant kangaroo rats subsist almost entirely on the seeds of annual plants such as brome grasses (*Bromus* spp.) and filaree (*Erodium* spp.), but also consume green vegetation, especially during the spring (U.S. Fish and Wildlife Service 1998). Seeds are harvested mostly during the spring and winter when they are dry and are cached in large quantities in burrows or buried in small, shallow holes at the surface (Shaw 1934). Giant kangaroo rats harvest, stack, and dry caches of grasses and forbs near the entrance of their burrows. Ripening heads of grasses and forbs are cut and cured in small surface pits located on the area over their burrow system and covered with a layer of loose, dry dirt. Some individuals also create large stacks of seed heads, which are cured at the surface of the burrow system before being transported underground.

Territoriality/Home Range

Giant kangaroo rat territories average 20 feet (6 meters) in diameter. Each kangaroo rat maintains and defends an individual territory in a colony that may consist of from two to thousands of precincts (core areas within territories). Giant kangaroo rat home ranges vary from about 645–3,768 square feet (60–350 square meters), with no significant size difference between sexes (U.S. Fish and Wildlife Service 1998).

Predator-Prey Relations

When abundant, giant kangaroo rat is a significant prey item for many predators, including San Joaquin kit fox (*Vulpes macrotis mutica*), American badger (*Taxidea taxus*), coyote (*Canis latrans*), long-tailed weasel (*Mustela frenata*), burrowing owl (*Athene cunicularia*), barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), and short-eared owl (*Asio flammeus*). Snakes observed within giant kangaroo rat colonies include coachwhip (*Masticophis flagellum*), gopher snake (*Pituophis melanoleucus*), common king snake (*Lampropeltis getulus*), and western rattlesnake (*Crotalus viridis*). Giant kangaroo rat may also be preyed on by blunt-nosed leopard lizards (*Gambelia sila*) and San Joaquin antelope squirrels (*Ammospermophilus nelsoni*) (U.S. Fish and Wildlife Service 1998).

Inter- and Intraspecific Interactions

Giant kangaroo rat is a keystone species in the grassland and shrub communities. This species provides

a significant prey base for many species. Insects and birds may potentially compete with giant kangaroo rats for seeds.

Population and/or Habitat Status and Trends

On National Forest System Lands

Not known to occur with less than 2000 acres of potential habitat.

Beyond National Forest System Lands

An estimated 1.8 percent of the giant kangaroo rat's historical habitat remains (Williams 1992). Populations in remaining habitat fluctuate widely in response to changing weather patterns. Current population trends for giant kangaroo rat are downward (Williams 1992, U.S. Fish and Wildlife Service 1998).

Threats and Conservation Considerations

The giant kangaroo rat population has declined primarily because of habitat loss. The loss of historical habitat to agricultural conversion may be as much as 98 percent. Before the late 1960s, little land within the species' historical range was permanently cultivated. Completion of the San Luis Unit of the Central Valley Project and the California Aqueduct of the State Water Project resulted in conversion of natural communities that provided habitat for giant kangaroo rat on the west side of the San Joaquin Valley, thus restricting the occurrence of the species (Williams 1992, U.S. Fish and Wildlife Service 2001). Widespread use of rodenticides and rodenticide-treated grain may have contributed to the decline of giant kangaroo rat and may have eliminated several populations (Williams 1992). Overgrazing may also be a factor in the species' decline, but there are no data available to support this hypothesis. Urban and industrial development, mineral and petroleum extraction, and associated infrastructure development have also contributed to the decline of giant kangaroo rat. Habitat degradation resulting from lack of grazing and fire, both of which control density of vegetation (including shrubs), may also be a threat to populations (U.S. Fish and Wildlife Service 1998).

The following is a list of conservation practices that should be considered for the giant kangaroo rat:

- Additional survey work is needed to determine conclusively if giant kangaroo rat occurs on the Los Padres National Forest. If surveys find any population on National Forest System lands, such range extensions should receive site-specific management attention.
- Suitable habitat with potential for reintroduction, should that become a priority, exists on the Forest (Freel pers. comm.).

Evaluation of Current Situation and Threats on National Forest System lands

Giant kangaroo rats inhabit native annual grassland and shrub land habitats on level and gently sloping ground with sandy, well-drained soils. By far and away the majority of habitat for the giant kangaroo rat has been lost to agricultural development occurring on private lands. Some limited surveys on National Forest System lands have occurred with no detection of the species on National Forest System lands. National Forest System lands are on the fringe of the habitat as indicated by only 2000 acres of potential habitat.

Based upon the above analysis the giant kangaroo rat has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcome Statement

The giant kangaroo rat only has potential habitat on National Forest System lands. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for giant kangaroo rat. The threat category of 2 remains the same through all alternatives.

The giant kangaroo rat is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the U.S. Fish and Wildlife Service at the site-specific level.

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Personal Communication

Freel, Maeton, Biologist, Los Padres National Forest. [Comment submitted to the USDA Forest Service Southern Province Forest Plan Revision species information peer review web site]. 1 July 2002.

Fringed Myotis **Golden-Mantled Ground Squirrel**