

5-YEAR REVIEW

Giant kangaroo rat (*Dipodomys ingens*)

GENERAL INFORMATION

Species: Giant kangaroo rat (*Dipodomys ingens*)

Date listed: January 5, 1987

Federal Register (FR) citation: 52 FR 283 (Service 1987)

Classification: Endangered

State Listing: The giant kangaroo rat was listed as an endangered species by the State of California on October 2, 1980.

BACKGROUND

Species overview:

The giant kangaroo rat is a small fossorial rodent species that resides in the Central Valley of California on relatively flat, open grasslands with few shrubs and little summer rainfall (Grinnell 1932, pp. 306–307; Bean et al. 2014, p. 6). The species is differentiated from other kangaroo rat species found in the San Joaquin Valley by their large size and hind feet with five toes (Grinnell 1922, p. 6). Giant kangaroo rats live alone where they defend a territory or precinct comprised of seed larders or pit-caches and a burrow that is accessed via multiple burrow entrances (Cooper and Randall 2007, pp. 1000–1001). They generally leave the protection of their burrows after dusk to forage (Braun 1985, p. 7). Giant kangaroo rats have fur-lined cheek pouches used to transport primarily seeds, but also vegetation and insects, to their burrows (Williams et al. 1993, p. 10; Grinnell 1932, p. 6). Giant kangaroo rats are considered a keystone species in California grassland ecosystems where their burrows are used by the federally and state listed as endangered blunt-nosed leopard lizard (*Gambelia sila* = *Gambelia silus*) and the state listed as threatened San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), among other species (Service 1998, p. ix; Goldingay et al. 1997, p. 49). They are also prey for the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*) (Service 1998, p. 91).

Most recent status review:

[Service] U.S. Fish and Wildlife Service. 2020b. 5-Year Review: Giant Kangaroo Rat (*Dipodomys ingens*). U.S. Fish and Wildlife Service, Sacramento, California. 6 pp.

We did not recommend a status change in the 2020 status review.

FR notice citation announcing this status review:

[Service] U.S. Fish and Wildlife Service. 2024. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews for 59 Pacific Southwest Species. Federal Register 89:83510–83514.

We received comments in response to the notice from the Center for Natural Lands Management (Center) regarding the giant kangaroo rat (D. Rogers, G. Warrick, and M. Labbé, Center, *in litt.* 2025, entire). Information provided by the Center is incorporated into this review (see

Distribution and abundance).

ASSESSMENT

Information acquired since the last status review:

This 5-year review was conducted by the U.S. Fish and Wildlife Service's (Service) Sacramento Fish and Wildlife Office. Data for this review were solicited from interested parties through a Federal Register notice announcing this review on October 16, 2024. We also requested data and information regarding the status of the giant kangaroo rat from land managers at the Bureau of Land Management (Bureau), the California Department of Fish and Wildlife (Department), and Sequoia Riverlands Trust (Sequoia); species experts; and academic researchers who study endangered and sensitive species in the San Joaquin Valley. In addition, we performed a literature search, obtained data from an occurrence search of the California Natural Diversity Database (Diversity Database) maintained by the Department, and reviewed information from our own files, including a search for any 10(a)(1)(A) recovery permits, reports associated with Habitat Conservation Plans, and projects for which consultation under section 7 of the Endangered Species Act has been initiated. Survey results and monitoring reports received from land managers indicate the species is still present at previously identified sites and has expanded into areas where the species was not previously known to occupy (addressed in **Distribution and abundance**). In addition, there is new and updated information regarding threats to the species (see **Threats**) and recent studies that assess the species' ability to recolonize fallowed agricultural land, distribution and occupancy, and genetics (see **Conservation and research**).

Distribution and abundance:

Historically, the giant kangaroo rat was found throughout the San Joaquin Valley, Carrizo and Elkhorn Plains, and Cuyama Valley with scattered colonies also found in the Ciervo, Kettleman, Panoche, and Tumey Hills, and in the Panoche Valley (Service 1998, p. 85). However, at the time of listing substantial populations were only known at the southern edge of the historical range (Service 1987, p. 283). Surveys after listing discovered additional areas still occupied by the species throughout its range (Service 2010, p. 13). The recovery plan identified six major geographic units each containing many smaller fragmented and isolated populations (listed from north to south): Ciervo-Panoche in Fresno and San Benito Counties; Kettleman Hills in Kings County; San Juan Creek Valley in San Luis Obispo County; western Kern County in the area of Lokern, Elk Hills, and other uplands around McKittrick, Taft, and Maricopa; the Carrizo Plain in San Luis Obispo County; and Cuyama Valley in Santa Barbara and San Luis Obispo Counties (Service 1998, pp. 85–87).

Overall, the current distribution of the giant kangaroo rat is similar to its description in the 2010 and 2020 status reviews. There are currently 143 total occurrences in the Diversity Database composed of five extirpated, 12 possibly extirpated, and 126 presumed extant occurrences (Diversity Database 2025, entire). Observation forms submitted to the Diversity Database but not yet processed by the Department include several new detections in areas within the currently known distribution. When processed, these are likely to result in additional occurrences and minor changes in the extent of existing occurrences.

Giant kangaroo rat population abundances fluctuate depending on the amount and timing of precipitation. Population abundance tends to decline during extended droughts due to reduced seed and food production (Germano and Saslaw 2017, p. 1624; Service 2020a, p. 14).

Abundance also declines in years of unusually high rainfall or following summer precipitation,

despite greater productivity of grasses and forbs as food sources for the species (Germano and Saslaw 2017, p. 1624; Service 2020a, pp. 5, 44; E. Tennant 2025, pers. comm.). Declines in years of excessive precipitation are likely the result of increased vegetative barriers to movement or spoilage of food stores (Germano and Saslaw 2017, p. 1624). Additional details regarding the distribution and abundance in each geographic unit are provided below.

Ciervo-Panoche

In portions of Bureau-managed lands in the Ciervo-Panoche geographic unit where monitoring of giant kangaroo rat occupancy occurs, populations continue to expand after two drought cycles (T. Bean and R. Namitz 2025, pers. comm.). There have been individual years of below-average rainfall, but the most recent multi-year drought ended with rainfall in the average range during the 2016 water year (October 2015 – September 2016). At another site managed by the Bureau, trapping surveys were conducted at the site of a blunt-nosed leopard lizard reintroduction program at the Panoche Hills Day Use Area to determine if giant kangaroo rats are returning to the area; three giant kangaroo rats were captured and released (Dillard 2025, p. 5).

The Center manages four preserves on which giant kangaroo rats occur or have the potential to occur, including the 26,420-acre Panoche Valley Preserve in the Ciervo-Panoche geographic unit (Rogers et al. *in litt.* 2025, p. 2). Annual small mammal trapping to monitor abundance on the preserve started in 2019, and giant kangaroo rats are consistently documented (Rogers et al. *in litt.* 2025, pp. 2–3). Although density varies each year, it has increased since surveys began with the highest densities recorded in 2023 and 2024 (Rogers et al. *in litt.* 2025, p. 3). Following the second year in a row of above-average rainfall, trapping surveys in 2024 captured at least one individual on each of the 32 sampling plots, which cover a total of 967 acres (Center 2024, p. 6). Following five years of baseline data collection at Panoche Valley Preserve, a series of vegetation management treatments were implemented in 2024 (Center 2024, p. 5). Monitoring to assess the effects of shrub restoration and grazing on small mammal abundance will begin in 2025 (Center 2024, p. 5).

Surveys in 2024 on two large, privately-owned properties in the Ciervo-Panoche geographic unit detected giant kangaroo rats. Trapping surveys on the first property, a portion of Ashurst Ranch, captured individuals in an area that had been recently grazed (Noce 2025, p. 6). This location is less than a mile west of occurrence #33 in the Diversity Database (2025, p. 9). That occurrence was last verified as occupied between 1979 and 1986. Biologists surveyed a second site that included portions of occurrences #98 and #190 (Diversity Database 2025, pp. 33, 118) and adjacent privately-owned lands. Giant kangaroo rats were captured in both occurrence areas and on the private lands along ridge-tops and gently sloped areas within the more steeply sloped hills (R. Lopez and A. Dziegiel 2025, pers. comm.). These results highlight the importance of these habitat corridors in maintaining connectivity across the Ciervo-Panoche geographic unit.

San Juan Creek Valley and Kettleman Hills

Monitoring in the San Juan Creek Valley and Kettleman Hills geographic units has not occurred, and little is known about the populations in these areas of primarily private lands (Service 2010, p. 12), although trapping surveys confirmed that they are still present in both units (Semerdjian et al. 2021, p. 861; ECORP 2024, pp. 6–8). Populations in the San Juan Creek Valley are thought to be isolated on private lands; however, continued expansion of populations in the Carrizo Plain geographic unit could re-establish connectivity (B. Swanson and C. Fiehler 2025, pers. comm.).

The Chalan Solar Project developed a habitat conservation plan for an approximately 600-acre site in Kern County that was previously used for agriculture and disked annually until 2023 (Chalan 2025, Chapter 2, p. 9). The site is not within any of the six geographic units, but it is near the Kettleman Hills geographic unit. In 2024, a walking survey of the site recorded signs of kangaroo rat activity (ECORP 2024, p. 5; Chalan 2025, Chapter 2, p. 10). Trapping surveys were conducted in July 2024, and giant kangaroo rats were captured throughout the project site (ECORP 2024, pp. 6–8; Chalan 2025, Chapter 2, p. 10).

Western Kern County

The Center manages four preserves on which giant kangaroo rats occur or have the potential to occur, including three preserves (Lokern, Lost Hills, and Petit) totaling 4,145 acres in the western Kern County geographic unit (Rogers et al. *in litt.* 2025, pp. 1–2). Small mammal trapping to monitor abundance occurs annually on Lokern and Lost Hills Preserves. Giant kangaroo rats have been consistently documented on Lokern Preserve since monitoring started in 2001, although density varies each year (Rogers et al. *in litt.* 2025, p. 1). Like at Panoche Valley Preserve, the number of captured giant kangaroo rats increased in 2024, and they were found on nearly every sampled grid (Center 2024, p. 7; Center 2025, p. 7). The species has not been found on Lost Hills Preserve; however, they were recorded on another property located within dispersal distance (Rogers et al. *in litt.* 2025, p. 2). Giant kangaroo rat burrows have been observed on Petit Preserve each year since its establishment in 2019 (Rogers et al. *in litt.* 2025, p. 2), except in 2021 when recent precinct activity was not confirmed (B. Kamansky, Center, *in litt.* 2025, p. 1).

On Lokern Ecological Reserve in the same vicinity of Kern County, giant kangaroo rats continue to be detected on grassland plots where trapping surveys have been conducted by the Department annually since 2012 (E. Tennant, Department, *in litt.* 2025, unpaginated attachment). On sampled plots with both giant kangaroo rats and smaller San Joaquin kangaroo rats (*Dipodomys nitratoides*), numbers of the smaller kangaroo rats appeared to remain high, even during drought years when giant kangaroo rat numbers decreased (E. Tennant 2025, pers. comm.). The giant kangaroo rat has not been captured on the more alkaline shrubland plots since 2021, although two subspecies of the San Joaquin kangaroo rat have been recorded there since that time (Tennant *in litt.* 2025, unpaginated attachment).

The California Department of Water Resources is currently developing a habitat conservation plan for impacts from its operations and maintenance of the State Water Project in the San Joaquin Valley. Small mammal trapping surveys were conducted in 2022 to provide baseline data regarding the distribution of kangaroo rat and other special-status species within the right-of-way of the main aqueduct and coastal branch aqueduct (Brylski 2023, p. 1). Giant kangaroo rats were captured in Kern County on the eastern side of the aqueduct at mile posts 215/216 and between mile posts 218/219 and 234/235 (Brylski 2023, p. 14), including in dense saltbush scrub habitat that is generally considered to be less suitable (Brylski 2023, p. 5). The record at mile post 215/216 is located several miles north of previously reported records (Brylski 2023, p. 23). This represents a small expansion in the species' known occupied area. Giant kangaroo rats were not captured in areas near Buena Vista Lake in 2017, 2018, and 2022 despite previously being recorded there (Brylski 2023, p. 23); the last known detection in this area (occurrence #93) was confirmed in 1987 (Diversity Database, p. 30).

Carrizo Plain

Several giant kangaroo rat populations in the Bureau-managed Carrizo Plain National Monument are monitored annually (Bean 2021, entire; Bean 2024, entire), and surveys indicate that populations continue to expand after two drought cycles (T. Bean and R. Namitz 2025, pers. comm.), the most recent of which ended in 2016. Land managers partially attribute the robust populations to the reduction or elimination of regular disking and rodenticide use associated with agriculture, two primary threats to the species (T. Bean and R. Namitz 2025, pers. comm.). Fewer individuals were trapped in 2023 as compared to previous years, but land managers believe that this is due to reduced trapping success rather than a change in abundance (Bean 2024, p. 3). This is supported by record high densities at Panoche Valley Preserve in 2023 and 2024 (Rogers et al. *in litt.* 2025, p. 3). Lands managed by the Department on the Carrizo Plain also continue to be used and recolonized by giant kangaroo rats (B. Swanson, Department, *in litt.* 2025, unpaginated geodatabase; B. Swanson and C. Fiehler 2025, pers. comm.).

Two solar projects have been constructed within the Carrizo Plain geographic unit. Giant kangaroo rats and their precincts have been observed and mapped within the solar arrays and along access roads of the California Valley Solar Ranch Project in San Luis Obispo County (H. T. Harvey and Associates 2025, pp. 10, 12, Appendix A), which is in the northern part of the Carrizo Plain geographic unit. In spring 2017, giant kangaroo rats were first detected on preservation lands that were acquired as mitigation for this project (Sequoia 2024a, p. 17). They were also detected the same year on preservation lands located to the north that were acquired for another solar project, Topaz Farms (Sequoia 2024b, p. 21). The preservation lands are located between the two solar projects and were previously used for agriculture, which may have precluded giant kangaroo rat use. Data from grid surveys and trapping surveys conducted in 2018 and 2023 indicate increases in occupancy and abundance at the California Valley preservation lands (Sequoia 2024a, pp. 19, 21–22) and low, but consistent occupancy at the Topaz Farms preservation lands (Sequoia 2024b, p. 23).

On Bitter Creek National Wildlife Refuge, near the southern extent of the species' range, a single male was captured in 2016 during small mammal surveys between 2014 and 2019 (Diversity Database 2024, p. 155; J. Felch, Service, *in litt.* 2025, p. 1). The animal was found in a portion of the refuge that was grazed by cattle the prior season (Service 2016, entire). Additional trapping has not occurred since 2019, but the species is likely still present (Felch *in litt.* 2025, p. 1).

Cuyama Valley

There is aerial evidence that an occurrence in the Cuyama Valley that was previously thought to be extirpated is now active (D. Hacker, Department, *in litt.* 2025, p. 1). However, giant kangaroo rat presence is difficult to verify since most lands in this area are privately owned with limited access permissions.

Threats:

At the time of listing, the primary threats to the species were identified as habitat conversion for agriculture and oil and gas extraction, predation on small populations, and the use of rodenticides (Service 1987, pp. 286–287; Service 1998, p. 92). The 2020 Species Status Assessment considered the additional threats of changing precipitation patterns and drought, invasive plant species, wildfire, inbreeding and genetic drift, disease and pathogens, and grazing (Service 2020a, p. 45). Habitat modification or destruction, stochastic precipitation patterns, drought, and

invasive plant species were determined to have species or population level impacts on the giant kangaroo rat (Service 2020a, Table 6, p. 45). These stressors continue to act on the species to various degrees. New information on stressors, including the additional potential stressor of parasitic mites, is compiled below.

Energy development

At the time of listing, the primary threat from energy development was from oil and gas extraction, which continue to degrade giant kangaroo rat habitat in western Kern, Kings, and Fresno Counties (Service 2020a, p. 34). The 2020 Species Status Assessment also discussed potential effects from solar development (Service 2020a, p. 34). Current energy development initiatives and carbon capture and storage projects that may occur in the range of the giant kangaroo rat have the potential to negatively affect large numbers of individual giant kangaroo rats during construction. However, these areas may be recolonized following construction and allow expansion of remnant populations onto lands where they were previously constrained by agricultural use, representing a conservation opportunity (see **Conservation and research**).

Carbon capture and storage is one of the many strategies being explored to help meet California's goal to transition to a net zero carbon economy (California Legislative Initiative 2022, p. 2). Applicants looking to develop this technology have submitted multiple projects for interagency cooperation under section 7 of the Endangered Species Act. To the extent that these projects utilize existing wells and infrastructure, they are not expected to pose large threats to giant kangaroo rat populations (T. Bean and R. Namitz 2025, pers. comm.). Multiple sites have been developed for energy transmission within areas used by giant kangaroo rats, and the species continues to be detected during pre-activity surveys prior to conducting routine operations and maintenance activities (H. T. Harvey 2025, p. 10; M. Prowatzke, Western Area Power Administration, *in litt.* 2025, p. 1). However, roads and other infrastructure required for these projects also increase fragmentation of habitat and result in occasional mortality and injury. In 2024, two giant kangaroo rats were found dead along public roads that are also used for operations and maintenance of a site (H. T. Harvey and Associates 2025, p. 13). Construction and operation of carbon capture and storage sites have individual-level impacts but likely do not comprise population-level threats.

Predation

While predation of giant kangaroo rats was a primary threat at the time of listing, the 2020 Species Status Assessment did not consider predation to be a current threat to the species (Service 2020a, p. 29). However, unusual giant kangaroo rat mortality events occurred at Carrizo Plain National Monument in the southern portion of the range from May – July 2019 and in May 2024 (J. Rudd, Endangered Species Recovery Program, *in litt.* 2025, Attachment 1, p. 1). During these events, giant kangaroo rat activity was particularly high throughout their range and included unusual activity during afternoon hours when individuals are normally below ground. During the same time period, common ravens (*Corvus corax*) were observed preying on giant kangaroo rats during the day (T. Bean and R. Namitz 2025, pers. comm.) and plucking posts and raven nests were found with giant kangaroo rat remains (Rudd *in litt.* 2025, Attachment 2, pp. 1, 3). Diagnostic testing was completed on a few carcasses, including screening for rodenticides, and trauma was determined to be the primary cause of death (Rudd *in litt.* 2025, Attachment 1, p. 1). Later in November 2024, two incidents of predation on large kangaroo rats by common ravens were observed in western Kern County (Clark and Reid 2024, p. 55). The observers were

unable to determine the exact species of kangaroo rat due to the distance, and it is unknown if ravens, known diurnal generalist predators, have learned to exploit this prey resource by extending their hunting to crepuscular periods (Clark and Reid 2024, p. 55). These events are hypothesized to be due to spatial competition during juvenile raven dispersal in years of record numbers following years of increased precipitation (T. Bean and R. Namitz 2025, pers. comm.).

Rodenticides

Although rodenticides were previously considered a primary threat to the species and may continue to cause mortality in areas where they are still heavily used such as orchards, vineyards, and cannabis grow sites (Service 2020a, p. 39), their overall effect at the population level is unknown (Service 2020a, p. 45). Rodenticides were not detected in the few carcasses from the Carrizo Plain that were submitted for diagnostic testing (Rudd *in litt.* 2025, Attachment 1, p. 1; Rudd *in litt.* 2025, Attachment 3, p. 2).

Insecticides

Insecticides may also negatively impact the species. The Environmental Protection Agency (Agency) released the final biological evaluations assessing the effects of labeled use of three neonicotinoid insecticides on listed species (Agency 2022a, entire; Agency 2022b, entire; Agency 2022c, entire). The three insecticides (clothianidin, imidacloprid, and thiamethoxam) are registered for use on a variety of agricultural crops; there are also some non-agricultural applications. The Agency's final biological evaluations determined that there is a potential for the three insecticides to adversely affect the species (Agency 2022a, pp. 4, Appendix 4, p. 1; Agency 2022b, pp. 2, Appendix 4, p. 1; Agency 2022c, pp. 3, Appendix 4, p. 1). Insecticides may directly impact giant kangaroo rats when consumed through treated seeds and invertebrates and indirectly impact the species by reducing availability of invertebrate prey. The Agency anticipates releasing amended proposed interim decisions.

Parasitic mites

Biologists continue to assess the effects of parasitic mite infestations on giant kangaroo rat health, ecology, and population dynamics (Dillard 2025, entire). Parasitic mites may cause skin reactions, poor body condition, and elevated stress hormones in giant kangaroo rats (Dillard 2020, p. 1). Results so far indicate that the likelihood of infestation is correlated with several possible variables including season, precipitation, grazing treatment, and reproductive status (Dillard 2025, p. 6). One objective of the study is to determine if individual giant kangaroo rats perceive mite infestations as a stressor as measured by fecal stress hormone metabolites (Dillard 2025, pp. 2–3). Parasitic mites may constitute an individual-level threat, but they may also rise to a population-level threat if mites are highly contagious.

Conservation and research:

Conservation activities for the giant kangaroo rat include land use change from agriculture to potentially suitable habitat, research on the effectiveness of aerial imagery in identifying occupied areas, and genetic analyses. Potential land use changes in the San Joaquin Valley present a possible conservation opportunity for the giant kangaroo rat. Routine cultivation practices preclude the species from lands used for crop production (Williams 1992, pp. 313–314). However, more than 500,000 acres of irrigated farmland are estimated to be removed from crop production by 2040 in response to California's Sustainable Groundwater Management Act (Hanak et al. 2019, p. 57). Lands that have been routinely disked for agricultural purposes may

become suitable for use by giant kangaroo rats once disking is removed, although some sites may require additional restoration.

For example, giant kangaroo rats were detected at the proposed Chalan Solar site the year after disking stopped (Chalan 2025, Chapter 2, p. 10) and fields that were fallowed for one year were reoccupied by giant kangaroo rats where populations persisted adjacent to agriculture (Williams 1995, p. 314). Precincts have been mapped under and adjacent to other solar arrays as part of pre-construction surveys prior to conducting routine maintenance activities at the California Valley Solar Ranch Project (H. T. Harvey 2025, p. 12 and Appendix A), portions of which were previously farmed (Service 2011, p. 76). Construction of the site was completed in October 2013. In 2015, the first year when precincts were mapped after construction, precincts were documented in a few areas primarily on the edge of solar arrays (H. T. Harvey 2016, p. 19); however, they have expanded and are currently mapped on the edges and within several arrays (H. T. Harvey 2025, p. 12). During construction, individuals were relocated as needed to avoid direct mortality (Service 2011, p. 29). Relocation of individuals is often used to minimize the effects of construction projects. A more recent study evaluating different release methods found that relocated animals had higher rates of survival when they are released into a temporary enclosure that contains an artificial burrow and when released with others in a spatial pattern like that in which they were captured (Saslaw and Cypher 2020, p. 34).

Another conservation action is recent research that evaluated the use of aerial imagery to identify giant kangaroo rat precincts (Rutrough et al. 2019, entire; Semerdjian et al. 2021, entire), which may locate occupied areas in places where access to conduct trapping surveys is restricted. Possible burrow mounds were identified from satellite and aerial imagery and compared with modeled habitat quality and occupancy results from manned aerial surveys and live trapping in multiple years (Semerdjian et al. 2021, pp. 860–861). This comparison helps to identify areas of disagreement where populations appear to be expanding, where there is a high potential for restoration, or where additional research is needed (Semerdjian et al. 2021, p. 864). A total of five giant kangaroo rats were captured at five locations during additional trapping surveys in the Ciervo-Panoche region to investigate areas of disagreement (Bean 2024, p. 3). These methods provide a useful tool for identifying specific areas for additional study for a species that is broadly distributed. The study also found that most (79.8 percent) of the areas predicted as high-quality habitat with signs of recent giant kangaroo rat activity occurred on public lands (Semerdjian et al. 2021, p. 861).

Additionally, genetic analyses were completed during the prior status review period using genetic samples from three of the six geographic units: Ciervo-Panoche in the north and Carrizo Plain and western Kern County in the south (Statham et al. 2019, pp. 549–550); these are also the largest known populations. These analyses determined that the northern and southern populations of the giant kangaroo rat are genetically distinct from one another (Statham et al. 2019, p. 554). Genetic analyses using samples collected from the remaining geographic units could help to elucidate the role the smaller central populations play in maintaining genetic diversity and metapopulation structure.

Recovery criteria:

Recovery criteria for downlisting and delisting the giant kangaroo rat are described in the Recovery Plan for Upland Species of the San Joaquin Valley, California (Service 1998, p. 181).

Downlisting criteria for giant kangaroo rat have not been fully met, thus, delisting criteria are not assessed here. Areas are considered secured and protected when they are: 1) protected for open space purposes through fee title ownership or conservation easement and 2) secured from incompatible uses.

Downlisting criteria

- 1) Secure and protect from incompatible use all occupied lands in the Carrizo Plain and Ciervo-Panoche (Service 1998, p. 181).
 - a. 2010 status: **Partially met.** At the time the recovery plan was established, there were an estimated 27,540 acres of extant habitat (Service 1998, p. 87), of which 16,974 acres were occupied on the Carrizo Plain (Williams 1992, p. 308). Restoration of lands previously used in agricultural production in this region along with additional field surveys resulted in an increase of occupied habitat to 78,000 acres (Service 2010, p. 13). Of these, 68,000 (87 percent) were protected (Service 2010, p. 8). In the Ciervo-Panoche, 700 acres were occupied at the time the recovery plan was established (Williams 1992, p. 308). As of the 2010 status review, there were 16,048 acres of protected habitat on Bureau lands located within Areas of Critical Environmental Concern and on a Department Ecological Reserve (Service 2010, p. 8–9). At that time, it was unknown to what extent giant kangaroo rats occupied the protected areas (Service 2010, p. 7).
 - b. 2025 status: **Fully met.** Additional lands in the Carrizo Plain have been protected since the 2020 status review as part of The Nature Conservancy’s efforts to restore prior agricultural lands in the San Joaquin Valley (S. Butterfield 2025, pers. comm.). In protected areas of the Carrizo Plain and Ciervo-Panoche where monitoring regularly occurs, giant kangaroo rat populations continue to expand (T. Bean and R. Namitz 2025, pers. comm.). The goal to protect 100 percent of occupied habitat represents a moving target as the species expands into previously unused habitats; therefore, under this criterion, we are assessing the extent of occupied lands at the time the recovery plan was published, rather than all currently occupied lands. While the Service does not have precise estimates of the number of occupied acres, particularly in the Ciervo-Panoche geographic unit, the amount of protected occupied habitat in the Carrizo Plain geographic unit exceeds more than three times the lands occupied at the time the recovery plan was established and the amount of protected habitat in the Ciervo-Panoche is nearly a magnitude greater than that known to be occupied when the recovery plan was established.
- 2) Secure and protect from incompatible use areas in western Kern County, as specified in the recovery strategy: a) 90 percent of the existing natural land in the Lokern area bounded on the east by the California Aqueduct, on the south by Occidental of Elk Hills, on the west by State Highway 33, and on the north by Lokern Road, b) 90 percent of the natural land in Elk Hills (Naval Petroleum Reserve 1) and 80 percent of the natural land in Naval Petroleum Reserve 2 including all lands in Buena Vista/McKittrick Valley between Elk Hills Road on the southeast and State Highway 33 on the northwest, and c) 80 percent of other occupied habitat in western Kern County.

- a. 2010 status: **Partially met.** At the time the recovery plan was established, there were an estimated 9,479 acres of occupied habitat in the western Kern County geographic unit (Williams 1992, p. 308). As of the 2010 status review, there were 24,731 acres of protected habitat of which only 1,316 acres were known to be occupied in the Lokern area, and occupancy in the remaining areas was unknown (Service 2010, pp. 6, 9–11).
 - b. 2025 status: **Partially met.** There are no known newly protected or occupied areas in the western Kern County geographic unit. Giant kangaroo rats have been observed at Chalan Solar Project, which is in Kern County but closer to the Kettleman Hills geographic unit. If constructed, the Chalan Solar Project will result in permanent protection of 260 acres in the Kettleman Hills geographic unit (Chalan 2025, Chapter 5, pp. 14–15).
- 3) Management plans, approved by the Service, are implemented for all protected areas identified as important to continued survival including the Carrizo Plain. The plans include survival of the species as an objective.
- a. 2010 status: **Partially met.** Not all protected areas have completed management plans (Service 2010, p. 11).
 - b. 2025 status: **Partially met.** Most protected areas have management plans. The plan for the Carrizo Plain Ecological Reserve, which is managed by the Department, is not finalized (B. Swanson and C. Fiehler 2025, pers. comm.). Mitigation lands for the Chalan Solar Project will operate under a Service-approved habitat management plan (Chalan 2025, Chapter 5, p. 15).
- 4) Population monitoring during a 5-year period in specified recovery areas shows no greater than 20 percent change in population size during years without drought or precipitation greater than 35 percent above average.
- a. 2010 status: **Partially met.** Annual monitoring indicates that populations are stable in the southern portion of the range following a period of drought and population decline (Service 2010, p. 11). However, long-term studies in the northern portion of the range do not occur due to a lack of funding (Service 2010, p. 12).
 - b. 2025 status: **Partially met.** Standardized abundance monitoring is not conducted in each geographic unit to determine if this criterion has been met. However, in areas where sampling occurs populations have remained stable to expanding over multiple drought cycles.

Conclusion:

After reviewing the best available scientific information, we conclude that the giant kangaroo rat remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Endangered Species Act and analysis of the status of the species in our 2020 status review remains an accurate reflection of the species' current status.

RECOMMENDATIONS FOR FUTURE ACTIONS

Here we propose several habitat conservation and ecological research recommendations that will aid in the recovery and conservation of the giant kangaroo rat. Some of these recommendations have already been discussed in our previous status review (Service 2020b, pp. 3–4) and remain valid.

1. Protect key dispersal corridors and sources of regional expansion including along Panoche Creek and Silver Creek in western Fresno County, the Panoche Valley in eastern San Benito County, and Buena Vista Valley in western Kern County.
2. Coordinate with groups like The Nature Conservancy to identify prior agricultural lands for restoration throughout the range of the giant kangaroo rat to increase connectivity. Prioritize conservation lands that benefit multiple San Joaquin Desert species including the San Joaquin kit fox, blunt-nosed leopard lizard, and San Joaquin antelope squirrel.
3. Include in all habitat management plans the flexibility to alter the dates and stocking rates of livestock to respond to annual plant production to prevent the dominance of invasive grass species in giant kangaroo rat habitat.
4. Continue long-term monitoring of populations in the Ciervo-Panoche, western Kern County, and Carrizo Plain geographic units.
5. Monitor giant kangaroo rats in possible expansion areas outside of the identified geographic units (Semerdjian et al. 2021, p. 862) and areas for which we have little data, particularly in the Cuyama Valley, San Juan Creek Valley, and between Kettleman Hills and western Kern County.
6. Collect genetic information from any individuals trapped in satellite populations in the Cuyama Valley, San Juan Creek Valley, and Kettleman Hills. Conduct genetic analyses and compare these with the results of previous genetic analyses (Statham et al. 2019, entire) to determine the role these populations serve in maintaining the metapopulation structure.

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Approve _____ Date _____

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