

**5-YEAR REVIEW**  
**Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)**

**GENERAL INFORMATION**

**Species:** Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)

**Date listed:** July 8, 1988

**Federal Register (FR) citation:** 50 FR 58454 (Service 1988)

**Classification:** Endangered

**State Listing:** The Tipton kangaroo rat was listed by the State of California as endangered in 1989.

**BACKGROUND**

**Species overview:**

The Tipton kangaroo rat is one of three subspecies of the San Joaquin kangaroo rat (*Dipodomys nitratoides*) in the Heteromyidae family. The Tipton kangaroo rat is morphologically distinguished from the other subspecies by being larger than the Fresno kangaroo rat (*D. n. exilis*) and smaller than the short-nosed kangaroo rat (*D. n. brevinasus*). On average, adults weigh about 35–38 grams (1.2–1.3 ounces), have a head and body length of about 100–110 millimeters (3.9–4.3 inches), and a tail length of about 125–130 millimeters (4.9–5.1 inches; Williams 1985, p. 4). Tipton kangaroo rats have sandy yellow fur on their heads and backs, white fur on their stomachs, and a white strip along their hind legs that continues down the sides of their long black tail. They have a large head, large dorsally placed eyes, and small, round ears. Tipton kangaroo rats have an average lifespan of 10–12 months and will rarely live longer than three years (Service 2020, p. 2). They prefer flat to slightly elevated terrain that is not subject to flooding in arid scrub habitats in the southern San Joaquin Valley of California.

**Most recent status review:**

[Service] U.S. Fish and Wildlife Service. 2020. Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*). 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California.

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 information from the Center for Natural Lands Management regarding the abundance and distribution of the subspecies at two preserves in Kern County in response to the notice (D. L. Rogers, G. Warrick, and M. Labbé, Center for Natural Lands Management, *in litt.* 2025). This information is further discussed in the **Distribution** and **Abundance** sections.

## 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 contacted species experts, state agencies, federal agencies, and the Endangered Species Recovery Program at California State University, Stanislaus, to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files, including a review of Tipton kangaroo rat 10(a)(1)(A) recovery permit annual reports and section 7 consultations. Lastly, we obtained data from an occurrence search of the California Natural Diversity Database (Diversity Database) maintained by the California Department of Fish and Wildlife. Since the last status review, multiple surveys have been conducted for the species, which are addressed in the **Distribution** and **Abundance** sections below.

### **Distribution:**

The historical range of the Tipton kangaroo rat was estimated to cover about 695,174 hectares (1,716,480 acres) within the Tulare Basin (Service 1998, p. 107). The distribution of the subspecies spanned from the southern margins of Tulare Lake east and south along the San Joaquin Valley floor in Tulare and Kern counties, reaching the Tehachapi Mountains to the south and the marshes of Kern and Buena Vista lakes to the west. The northwestern boundary was marked by the unincorporated communities of Lost Hills, Kettleman City, and Westhaven.

At the time of listing, the Tipton kangaroo rat was known to only inhabit 3.7 percent (25,643 hectares or 63,367 acres) of its historical range (Service 1988, p. 25609). In the 2010 status review, the subspecies was still found within Kings, Tulare, and Kern counties but in small, fragmented patches scattered across the three counties (Williams 1985, pp. 6, 8; Service 2020, pp. 2–3). In the 2020 status review, many small populations were said to have declined or become locally extirpated within the previous 10 years, including populations on the Naval Air Station Lemoore (Lemoore), Pixley National Wildlife Refuge, Allensworth Ecological Reserve, and North Kern State Prison (Service 2020, pp. 4, 18).

Currently, populations of the Tipton kangaroo rat still exist in many small, fragmented habitat patches within the southwestern San Joaquin Valley. Figure 1 shows the current distribution of the Tipton kangaroo rat based on information in research papers, presence/absence surveys, and annual monitoring efforts for the subspecies conducted between 2016 and 2024 (Cypher et al. 2016, Appendix C, D; Live Oak Associates 2019, pp. 13–14; R. Young, Phoenix Biological Consulting, *in litt.* 2020; Cypher 2023, p. 13; Saslaw 2023, p. 4.; C. Chase, Bureau of Land Management, *in litt.* 2024; Gabaldon et al. 2024a, entire; Rogers, Warrick, and Labbé *in litt.* 2025, pp. 2–3; Diversity Database 2025, unpaginated; E. Tennant, California Department of Fish and Wildlife, *in litt.* 2025a, b; F. Cannizzo, Westervelt Ecological Services, *in litt.* 2025; J. Jones, SVB Consulting LLC, *in litt.* 2025a, b; R. McCormick, McCormick Biological, *in litt.* 2025).



The current boundaries of the Tipton kangaroo rat's range, particularly to the west and north, have been a subject of uncertainty. All three subspecies of the San Joaquin kangaroo rat—Tipton, Fresno, and short-nosed—are found in the southern half of the San Joaquin Valley. Short-nosed kangaroo rats primarily inhabit the foothills and basins along the western edge of the valley, including areas like Los Banos and Merced County. Early research indicated that short-nosed and Tipton kangaroo rats could be distinguished along the western side of the valley based on skeletal and external measurements (Department of Water Resources 2023, pp. 22–23). A subsequent analysis revealed that their distribution closely aligned with the California aqueduct (Williams 1985, p. 2), which has since served as a key geographic boundary used to distinguish between the two subspecies with short-nosed kangaroo rats assumed to occur on the western side of the aqueduct and Tipton on the eastern side. In 2019, additional research based on morphometric analyses indicated that the differences between the two subspecies were more pronounced in the northern region (north of Kern County, including study sites in Kings and Tulare counties), whereas in the southern region external measurements cannot reliably distinguish between the subspecies (Department of Water Resources 2023, p. 23; Patton et al. 2019, p. 6). There is also a hypothesis that intergradation between the two subspecies has occurred in the past within the southwestern portion of the range (Department of Water Resources 2023, p. 23). This hypothesis is being investigated further through the California Conservation Genomics Project, a comprehensive genomic study led by the La Kretz Center for California Conservation Science at the University of California, Los Angeles (Genomics Project 2025, entire).

On the eastern side of the San Joaquin Valley, Tipton kangaroo rats are found in the south of the valley while Fresno kangaroo rats inhabit the north. The boundary between their ranges is located near Lemoore and the northern extent of the Tulare Lakebed (B. Cypher, Endangered Species Recovery Program, pers. comm. 2025). Studies from the 1990s at Lemoore yielded varying conclusions about which San Joaquin kangaroo rat subspecies was present, but a recent genetic and morphometric study indicates that the subspecies captured at Lemoore more closely resemble Fresno kangaroo rats (Colon 2021, p. 1; Patton et al. 2019, p. 12). Approximately 15.3 kilometers (9.5 miles) southeast of Lemoore, at the intersection of Jackson Avenue and Highway 41, there is also suitable habitat that shows evidence of use by kangaroo rats (Colon, 2021, pp. 4–5). The kangaroo rats in this area have been classified as Tipton kangaroo rats; however, genetic testing has not been completed. Further genetic research on the kangaroo rats located north of the Tulare Lakebed within Kings County is needed to clarify the subspecies' geographic ranges. Results from the California Conservation Genomics Project, which includes the San Joaquin kangaroo rat along with other kangaroo rat species (Genomics Project 2025, entire), may better inform our understanding of the taxonomy of the occurrences in the area surrounding Lemoore, as well as in the southwestern San Joaquin Valley as mentioned above.

### **Abundance:**

In the 1988 listing rule for the Tipton kangaroo rat, abundance was briefly mentioned. The rule stated that low to moderate density Tipton kangaroo rat populations were found on the roughly 2,603 hectares (6,434 acres) of habitat administered by local, state, and federal governments, but descriptions for 'low' and 'moderate' densities were not provided (Service 1988, p. 25609). As mentioned in **Distribution**, populations in several areas including Lemoore, Pixley National Wildlife Refuge, Atwell Island on Allensworth Ecological Reserve, and North Kern State Prison had declined to undetectable numbers or had been extirpated by the time of the 2020 status

review (Chase *in litt.* 2025; Colon 2021, pp. 3–4; Jimenez *in litt.* 2024; Service 2020, p. 18). However, the subspecies was thought to still be abundant at some sites including the Semitropic Ecological Reserve and Lokern Natural Area and Preserve (Service 2020, p. 4).

Current range-wide population estimates are not available for the Tipton kangaroo rat. However, similar to many other listed San Joaquin Valley species, population sizes of the Tipton kangaroo rat are known to fluctuate annually based on environmental conditions, particularly precipitation (B. Cypher, Endangered Species Recovery Program, *in litt.* 2025a). Experts have noted that for all species in the San Joaquin Valley, population numbers drop to near undetectable during prolonged drought but will rebound dramatically after a few wet years (Cypher, *in litt.* 2025a). The underlying mechanisms involved in the population fluctuations of the Tipton kangaroo rat have not been investigated. However, populations of other San Joaquin kangaroo rats and the giant kangaroo rat often experience "boom-and-bust" cycles, which can be triggered by excessive rainfall that results in greater vegetation cover, increased predation rates, and the spoiling of food caches, or by insufficient rainfall that results in inadequate food production to sustain the population (Cypher, Endangered Species Recovery Program, *in litt.* 2025b; Germano and Saslaw 2017, p. 1624).

In areas of high-quality habitat population numbers are relatively stable, but with continued habitat loss on private lands, it is assumed that the range-wide population is slowly in decline (B. Cypher, Endangered Species Recovery Program, *in litt.* 2024). Consistent population monitoring at Semitropic Ecological Reserve, Lokern Natural Area and Preserve, Kern National Wildlife Refuge, Coles Levee Ecosystem Preserve, and Kern Water Bank Conservation Bank has shown relatively stable and healthy populations of the subspecies in these areas (Jones, *in litt.* 2025a; Jones, *in litt.* 2025b; Kelly et al. 2023, pp. 4–8; Rogers, Warrick, and Labbé *in litt.* 2025, pp. 2–3). Within the Kern National Wildlife Refuge, Tipton kangaroo rats continue to inhabit an area of the refuge known as Unit 15 (Gabaldon et al. 2024b, entire). Unit 15 is a parcel of land found on the northwest side of the Kern National Wildlife Refuge, consisting of healthy and functional alkali sink habitat. In 2023 and again in 2024, one Tipton kangaroo rat was detected for the first time since 1998 in Unit 12, which is on the Kern National Wildlife Refuge south of, and adjacent to, Unit 15 (Davenport 2024, p. 25). The refuge has been carrying out invasive plant species removal since 2019, with a large amount of invasive salt cedar (*Tamarix* spp.) being removed within Unit 12 (Davenport 2024, pp. 15, 54). Refuge staff are hopeful that with the removal of invasive salt cedar, Tipton kangaroo rats will continue to move into Unit 12 and naturally recolonize the area (Davenport 2024, p. 11).

### **Threats:**

Since the Tipton kangaroo rat was listed in 1988, the main threat to the subspecies throughout its range has been habitat loss due to agricultural development. Other threats such as small population size, habitat fragmentation, and broad-scale application of rodenticides were also described in the listing rule (Service 1988, pp. 25609–25610). In the 2010 status review, flooding, interspecific competition with Heermann's kangaroo rat (*D. heermanni*), thatch accumulation, and climate change were identified as additional threats to the subspecies (Service 2010, pp. 31–52). The 2020 status review also mentioned that increases in non-native grasses and the frequency of extreme drought may have negative effects on the subspecies (Service 2020, pp. 7–8). Currently, habitat conversion and fragmentation remain the primary threats to the subspecies (Cypher *in litt.* 2024).

Pesticides may also negatively impact the subspecies. The Environmental Protection Agency (Agency) released final biological evaluations assessing the effects of labeled uses of three neonicotinoid pesticides on listed species in 2022 (Agency 2022a, entire; Agency 2022b, entire; Agency 2022c, entire). The three pesticides (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 pesticides to indirectly adversely affect the Tipton kangaroo rat (Agency 2022a, pp. 4, Appendix 4-1; Agency 2022b, pp. 2, Appendix 4-1; Agency 2022c, pp. 3, Appendix 4-1). Pesticides may directly impact Tipton kangaroo rats when consumed through treated seeds and invertebrates and indirectly impact the subspecies by reducing availability of invertebrate prey. The Agency anticipates releasing amended proposed interim decisions.

**Recovery criteria:**

The recovery criteria for downlisting and delisting the Tipton kangaroo rat are described in the Recovery Plan for Upland Species of the San Joaquin Valley, California (recovery plan; Service 1998, pp. 111–113, Table 4, Table 5). The recovery plan identifies three main recovery areas for the subspecies: Pixley National Wildlife Refuge and the Allensworth Ecological Preserve; Kern National Wildlife Refuge and the Semitropic Ridge conservation lands; and the Kern River alluvial fan area that consists of the Kern Water Bank Conservation Bank, Coles Levee Ecosystem Preserve, and other mitigation parcels (Service 1998, p. 112). We provide an assessment of progress towards the recovery criteria for the Tipton kangaroo rat in Table 1 below. The downlisting criteria for the Tipton kangaroo rat have not been fully met; therefore, the delisting criteria are not included in this analysis.

**Table 1.** Downlisting criteria for the Tipton kangaroo rat. Status at the time of the previous status reviews (Service 2010, pp. 2–52; Service 2020, pp. 11–12) and current are assessed.

Downlisting criteria	2010/2020 Status	2025 Status
Secure and protect from incompatible uses three or more distinct areas with 2,000 hectares (4,940 acres) or more of contiguous, occupied habitat with 30% or more of the minimum acreage in public or conservation ownership.	<b>Not met.</b> Although some occupied land was in public/conservation ownership, the extent was unknown. Furthermore, the protected parcels were small, fragmented, and isolated from each other.	<b>Partially met.</b> Two recovery areas with contiguous occupied habitat consisting of at least 2,000 hectares (4,940 acres) each have been identified for the Tipton kangaroo rat. The first area is comprised of the Kern National Wildlife Refuge, the Semitropic Ecological Reserve, the Semitropic Ridge Preserve, and Kern County land parcels. The second area includes the Coles Levee Ecosystem Preserve and the Kern Water Bank Conservation Bank. Lands within both areas mentioned above are in public or conservation ownership. Landowners consist of the Service, California Department of Fish and Wildlife, Center for Natural Lands Management, and Kern County. Systematic surveys throughout each of these recovery areas are still needed to assess the amount of currently occupied habitat. The recovery plan identifies Pixley National Wildlife Refuge and Allensworth Natural Area as a third area to focus recovery efforts for the subspecies. However, the subspecies has been

Downlisting criteria	2010/2020 Status	2025 Status
		extirpated from these areas (see <b>Distribution</b> ; Service 2020, pp. 2, 5). Until further efforts are made to identify and mitigate the causes of extirpation, the area will continue to remain unoccupied. Furthermore, additional areas with contiguous habitat would need to be identified, secured, and protected from incompatible uses within this recovery area to meet the criterion of 2,000 hectares (4,940 acres) or more.
Approved and implemented management plan that includes Tipton kangaroo rat survival as an objective for all protected areas.	<b>Not met.</b> Some areas identified as important to the continued survival of the subspecies had management plans, but not all of them.	<b>Partially met.</b> All protected areas within the two extant recovery areas mentioned above, except for the Kern County land parcels, have management plans that have been approved and are being implemented.
Population monitoring in specified recovery areas shows stable or increasing Tipton kangaroo rat populations through one precipitation cycle.	<b>Not met.</b> Opportunistic surveys suggested that populations were not stable or increasing and may have been extirpated at some sites.	<b>Partially met.</b> Long-term monitoring has been conducted in areas of the Kern National Wildlife Refuge, Semitropic Ecological Reserve, Semitropic Ridge Preserve, Coles Levee Ecosystem Preserve, and Kern Water Bank Conservation Bank. The monitored populations within these areas have demonstrated stable populations over a precipitation cycle (see <b>Abundance</b> ). However, as noted above, the subspecies has been extirpated from Pixley National Wildlife Refuge and Allensworth Natural Area within the third specified recovery area.

**Conclusion:**

After reviewing the best available scientific information, we conclude that the Tipton kangaroo rat remains an endangered subspecies. The evaluation of threats affecting the subspecies under the factors in 4(a)(1) of the Endangered Species Act and analyses of the status of the subspecies in our 2020 5-year review remain an accurate reflection of the subspecies’ 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 Tipton kangaroo rat. Some of these recommendations have already been discussed in previous recovery documents (Service 1998, pp. 112–113; Service 2010, pp. 53–55; Service 2020, p. 12) and remain valid.

1. *Genetic Research.* Prioritize genetic research and studies of any captured kangaroo rats in the Lemoore area near Highway 41 and Jackson Avenue, the northern edge of the historical Tulare Lake Basin, and within the vicinity of the southwestern portion of the California aqueduct to elucidate the taxonomic identity of the San Joaquin kangaroo rats in these areas and the boundaries of the Tipton, Fresno, and short-nosed subspecies ranges.

2. *Habitat Acquisition, Management, and Restoration.* All sites with Tipton kangaroo rats present should be protected and secured from incompatible uses. Resource agencies and private partner groups should work to ensure land protection through title acquisition or conservation easement, and large unprotected areas currently occupied by the subspecies should be given the highest priority. Protected lands must also be adequately managed or restored based on the best available science. Large, formerly-occupied sites at Pixley National Wildlife Refuge and Allensworth Ecological Reserve, should also be considered for restoration.
3. *Determine Population Status and Monitor at Occupied Sites.* Determine the current distribution and abundance of the Tipton kangaroo rat on sites where they occur, including all sites identified by Cypher et al. (2016, Appendix B), and develop a plan to monitor abundance and population trends at those sites. Survey results should be compiled into an analysis that identifies and characterizes the habitat at currently occupied sites. These results should also be used to help inform decision-makers about the acquisition of appropriate sites where Tipton kangaroo rats occur but are unprotected, to identify sites that could be acquired for restoration, and to develop an adaptive management program that will achieve the recovery of the Tipton kangaroo rat.
4. *Microhabitat Characterization and Mapping.* A map characterizing the floristic community at the microhabitat level will help identify habitat characteristics important for Tipton kangaroo rats. These data should come from natural lands where large populations still exist. This map will inform future conservation actions for the species, such as identifying sites for habitat restoration and translocations.
5. *Water Control Systems for Natural Lands.* Natural lands on the floodplain of the Central Valley do not have levee infrastructure and are prone to flood in wet years or during heavy precipitation events. Adaptive management and water control systems may be needed to prevent flooding that harms Tipton kangaroo rats but allow for sufficient water to provide wetland habitat for co-occurring species such as the Buena Vista Lake ornate shrew (*Sorex ornatus relictus*).
6. *Translocation Study and Research.* Despite the inherent challenges involved with translocations, moving individuals might be necessary to establish or augment populations of Tipton kangaroo rats for recovery purposes. Research into new techniques is needed to determine best practices for translocations.

**Acting Field Supervisor, Sacramento Fish and Wildlife Office**

Approve \_\_\_\_\_ Date \_\_\_\_\_

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### **In Litteris**

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### **Personal Communication**

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