

Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats
U.S. Fish and Wildlife Service
Sacramento Field Office
March 2013

The following protocol is designed for determining the presence of San Joaquin kangaroo rats, to include the following:

Common Name	Scientific Name	Federal Listing	State Listing
Fresno kangaroo rat	<i>(Dipodomys nitratooides exilis)</i>	Endangered	Endangered
Tipton kangaroo rat	<i>(Dipodomys nitratooides nitratooides)</i>	Endangered	Endangered
Short-nosed kangaroo rat	<i>(Dipodomys nitratooides brevinasus)</i>	Not Listed	Special Concern

These three species will be known hereafter as the “kangaroo rat(s)”. This survey protocol was approved by the U.S. Fish and Wildlife Service (Service) on March 4, 2013. This protocol will be conducted only by those individuals holding valid section 10(a)1(A) recovery permits from the Service and valid scientific collecting permits from the California Department of Fish and Wildlife (CDFW), as appropriate. This protocol is to be used in concert with the terms and conditions of those permits. This protocol is not intended to provide a basis for concluding that the species is absent from a site. Other activities involving the listed kangaroo rats that may require a permit, such as scientific research involving methods other than standard trapping and measuring animals are not part of this protocol and should be addressed in separate applications for Federal and State permits.

This information is provided as a starting point for biologists writing proposals for surveys and limited research work for the listed kangaroo rats in the jurisdiction of the Sacramento Fish and Wildlife Office (SFWO). Please note that each site-specific work plan will be independently evaluated according to the balance of the risks and benefits as to whether they can reasonably be expected to promote the recovery of the species in question, including proposed work plans submitted as part of a recovery permit application. As such, proposals for work need to provide a specific context of research objectives, defined with adequate specificity to enable a determination by the SFWO of whether the work would: jeopardize the species; minimize the impacts of the work on the individuals, populations, and the species; and would be reasonably expected to promote the recovery of the species.

One implication of this protocol is that deviations from any particular aspect of the methodologies described should be accompanied by an explanation of why the variance would reasonably be expected to increase the benefits of the work, or reduce the risks, and by how much. Such explanations should include information from any literature or unpublished information that provides field-tested conclusions in support of your argument, whenever such material is available. This can include information from work with similar species—the greater the similarity to the species, locations, and work proposed, the better the support it would provide that the improved results of the methodology would be expected to apply to the proposed work.

The more unique your proposed work plan is, the more lead time you should allow for evaluation by the Service and CDFW. Researchers may reduce evaluation delays by coordinating with the agency offices involved to be sure that everyone who needs to participate in the review and approval of your work plan has received copies of the plan.

Background information on the distribution, abundance, life history, ecology, threats and ongoing research of the Fresno and Tipton kangaroo rats is updated in Service produced status reviews completed every five years and published online at:

Tipton Kangaroo Rat (http://ecos.fws.gov/docs/five_year_review/doc3228.pdf)

Fresno Kangaroo Rat (http://ecos.fws.gov/docs/five_year_review/doc3214.pdf).

Survey Methods

1. Live-trapping is the only method for reliable identification of kangaroo rats in the San Joaquin Valley. It may be possible to determine the presence of kangaroo rats (*Dipodomys* spp) based on a variety of factors. Preliminary assessments to determine the probability that kangaroo rats may be present at a particular site should be based on a number of factors including species range, presence of habitat, and the presence of tail drags and tracks. Skeletal remains found in owl pellets may reveal the presence of kangaroo rats in the general area. The locations of suitable habitat, potential burrows, and other signs of kangaroo rat activity should be reported to the Service and the CDFW as part of the survey authorization request.
2. A team of a minimum of two biologists is recommended to survey for the kangaroo rats at the specified locations. For greater trapping efforts involving large survey areas and using an increased number of traps, additional teams of biologists may be needed to safely and reliably conduct the surveys within the time constraints listed in the terms and conditions below. The Service will approve all trapping plans in advance, including the number of trapping teams to be used.
3. Only Sherman live traps with sufficient length [Sherman Extra-Large Kangaroo Rat live traps (7.6 x 9.5 x 30.5 cm; *H.B. Sherman Traps Inc. Tallahassee, FL*)] or modification to eliminate or substantially reduce the risk of tail injury shall be used. The use of other types of traps or other trap designs should be approved by the Service prior to their use. For detecting the presence of kangaroo rats at a particular site, live-traps should be placed close to burrow entrances, along runways, and near rodent sign to increase the potential for trapping success. For larger survey areas traps can be laid out in regular grid patterns. Trap arrays may also be set up in unique configurations to answer specific research questions. The planned density of traps and the geographic layout of trap arrays should be presented in the survey authorization requests to the Service and CDFW. Traps should be placed 5 meters or greater away from of any active ant mounds.
4. The Service recommends flagging the ends of each trap line or flagging individual trap clusters within trap lines. Uneven terrain and dense vegetation at the trapping site may increase the difficulty in finding traps. Flagging traps or trap lines is at the discretion of the biologist conducting the trapping. Marking trap locations using GPS is also recommended.
5. Traps should be baited with white proso millet, bird seed mixture, rolled oats, oatmeal, or other appropriate bait and provided with material for nesting and/or shredding. Wadded paper towels should be used for shredding material.

6. Kangaroo rats are active year around, but optimum activity periods occur from April 1 to October 31. It is recommended that trapping be completed within this activity period. Trapping outside of this time period will require additional trapping effort (increase in trap density and survey period).
7. Sherman traps will be set approximately 1 hour before sunset and will be checked no later than 1 hour after sunrise the following morning. Traps may be checked more frequently depending on the survey goals.
8. During the threat of inclement weather, such as the National Weather Service prediction of a 40 percent or greater chance of rain, all traps will be closed. Should the air temperature exceed 105 °F (41 °C), all traps will be closed. If the air temperature is predicted to drop below 50 °F (10 °C) then the following measures will be taken to reduce the effects of the colder weather on captured kangaroo rats:
 - a. Once set, traps will be checked at a minimum interval of every 3 hours,
 - b. Synthetic batting or other appropriate insulating material will be placed in the open trap,
 - c. Additional food will be placed in the open trap, and
 - d. Trapping will cease if captured animals are found to be lethargic or otherwise are showing signs of a decrease of body temperature.
9. Traps should be set and monitored for a minimum of five consecutive nights. If the survey is for determining presence only, then the trapping will end upon the first capture of the target species. The duration of trapping may be altered if authorized in advance by the SFWO.
10. All animals trapped will be identified to species, measured, weighed, and age class and sex will be recorded. If the survey includes a mark-recapture study the preferred method of marking individual kangaroo rats is to make a unique mark with a non-toxic, felt-tipped marker. Passive Integrated Transponder (PIT) tags provide a more permanent mark; however, use of these tags must be authorized by the Service in advance unless they are specified for use in a 10(a)1(A) permit.
11. All kangaroo rats will be immediately released at the location they were trapped following data collection. No animals will be removed from the wild without prior authorization from the Service and CDFW.
12. Any kangaroo rat incidentally killed during surveys or research will be placed in a freezer as soon as practical. Kangaroo rat carcasses shall ultimately be placed in the collection of a professionally maintained scientific facility or museum with the appropriate permits. A list of preferred facilities is included as a term and condition in the section 10(a)1(A) permit. The permittee will check with the accepting facility for instructions on preparation of the carcass for shipment or transport. SFWO will be notified by telephone within 1 working day of a kangaroo rat mortality, and in writing within 2 weeks of the incident. A final report summarizing trapping efforts and all data collected will be submitted to the SFWO within 30 days of completion of surveys to the Chief of the Endangered Species Division.

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