

**San Joaquin Kit Fox
Management Plan
for the
Mariposa Energy Project
(09-AFC-03C)**

Submitted to the
California Energy Commission

Submitted by
Mariposa Energy, LLC

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With Assistance from

CH2MHILL

2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

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San Joaquin Kit Fox Management Plan

1.0 Introduction

This document provides a management plan for San Joaquin kit fox (*Vulpes macrotis mutica*). This plan is being provided to meet Condition of Certification (COC) BIO-14 set by the California Energy Commission (CEC) for the proposed Mariposa Energy Project (MEP) (09-AFC-03) and will be incorporated into the MEP Biological Resources Mitigation, Implementation and Monitoring Plan.

The San Joaquin kit fox is the smallest fox in North America, with an average body length of 20 inches and weight of about 5 pounds. It is a member of the Canidae family, which includes dogs, wolves, and foxes. San Joaquin kit foxes are lightly built, with long legs and large ears. Their coat ranges from tan to buff gray in the summer to silvery gray in the winter. Their belly is whitish and their tail is black-tipped (USFWS, 2011). In the northern portion of their range, which includes the MEP project area, kit foxes have been found to most frequently consume California ground squirrels. Cottontails, black-tailed hares, pocket mice, and kangaroo rats also are also part of the kit fox diet. Although ground squirrels are diurnal and kit foxes are predominantly nocturnal, kit foxes are commonly seen during the day during late spring and early summer (USFWS, 1998).

Kit foxes can breed when 1 year old, but may not breed their first year of adulthood. Adult pairs remain together all year, sharing the home range but not necessarily the same den. During September and October, adult females begin to clean and enlarge natal or pupping dens (they select dens with multiple openings). Mating and conception take place between late December and March. The median gestation period is estimated to range from 48 to 52 days. Litters of from two to six pups are born sometime between February and late March (USFWS, 1998).

Kit fox dens most often are located on the lower section of a hill. In the northern portion of the kit fox range, where the MEP is located, dens appear to be located higher than most surrounding ground compared to areas farther south, perhaps reflecting the topography of the area. Most northern region dens lack the ramp or runway characteristic of dens in the southern and central portions of their range. Kit foxes probably enlarge California ground squirrel burrows, but they also may construct their own dens. Kit foxes often change dens and numerous dens may be used throughout the year. However, evidence that a den is in use may be absent. Kit fox change dens four or five times during the summer months, and change natal dens one or two times per month. Den changes have been attributed to depletion of prey in the vicinity of the den or to increases in external parasites such as fleas. Avoidance of coyotes is a more probable reason for frequently changing dens (USFWS, 1998).

In California, kit fox are understood to have a home range of approximately 1 to 2 square miles. (California Department of Fish and Game [CDFG], 2011). No sign of kit fox was observed within the proposed project area during reconnaissance-level surveys in 2010 conducted for the project. However because kit fox are often difficult to detect and leave

very little sign at burrow entrances, implementation of this management plan will provide for the protection and monitoring of kit fox that may be detected during the course of project construction.

The avoidance, minimization, and monitoring measures being proposed in this plan are subject to final approval by the CEC's Compliance Project Manager (CPM) in consultation with CDFG and the U.S. Fish and Wildlife Service (USFWS). This plan follows the guidelines provided by the USFWS *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or during Ground Disturbance* (1999).

2.0 Project Description

MEP will be a nominal 200-megawatt (MW), simple-cycle generating facility consisting of four power blocks. Each power block will contain one GE LM6000 PC-Sprint natural-gas-fired combustion turbine generator. The generated power will be delivered to the grid via Pacific Gas and Electric Company's (PG&E) Kelso Substation. The new facility will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations and standards. The main access to the facility site will be from Bruns Road. A portion of the site will be paved to provide internal access to all project facilities and onsite buildings. The areas around equipment, where not paved, will have gravel surfacing. The project also includes: a new, approximately 0.7-mile-long, 230-kV transmission line to deliver the plant output to the electrical grid via the existing 230-kV Kelso Substation located north of the project site; approximately 580 feet of new natural gas pipeline that will run directly northeast from the project site to interconnect with PG&E's existing high-pressure natural gas pipeline; and a new 1.8-mile water supply line from the Byron-Bethany Irrigation District Canal 45 to deliver raw water to the project site.

The facility site is in northeastern Alameda County, in an unincorporated area designated as Large Parcel Agriculture by the East County Area Plan. The site is located approximately 7 miles northwest of Tracy, 7 miles east of Livermore, 6 miles south of Byron, and approximately 2.5 miles west of the community of Mountain House in San Joaquin County. The facility will be located southeast of the intersection of Bruns Road and Kelso Road on a 10-acre portion of an approximate 158-acre parcel immediately south of the Bethany Compressor Station and 230-kV Kelso Substation, both owned by PG&E. The proposed power plant site is located in the southern portion of the project parcel. The existing, unrelated 6.5-MW Byron Power Cogen Plant occupies 2 acres of the 158-acre parcel northeast of the proposed MEP site. The remainder of the parcel is non-irrigated grazing land and will remain as such during MEP operation. A wind turbine development was once located on the southern portion of the parcel, including the MEP site. Concrete foundations and other miscellaneous debris, including remnants of turbine housings, remain onsite.

3.0 Regulatory Status for San Joaquin Kit Fox

The San Joaquin kit fox was listed as endangered by the U.S. Department of the Interior in 1967, and by the State of California in 1971.

4.0 Proposed Mitigation Measures

Implementation of the measures presented in this plan may be necessary to avoid violating the provisions of the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA). Both the federal ESA and CESA prohibit “take” (defined as killing, harming, or harassing a listed species, including actions that damage or destroy its habitat). Such protection measures may also be required under the terms of a biological opinion pursuant to section 7 of the ESA and CEC Conditions of Certification (in coordination with CDFG pursuant to CESA) resulting in incidental take authorization. Construction of MEP will involve ground-disturbing activities that could directly or indirectly affect kit fox. This section presents proposed mitigation measures to minimize or eliminate impacts on kit fox if they occur onsite.

4.1 Preconstruction Surveys

Before project construction begins, biologists approved by USFWS and the CPM (in consultation with CDFG) will conduct preconstruction surveys for San Joaquin kit fox dens in the project area, including areas within 200 feet of all project facilities, utility corridors, and access roads.

Preconstruction surveys will be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to affect San Joaquin kit fox. Surveys will follow established protocols or guidance provided in this plan. Survey results will identify habitat features on the project site. An evaluation of potential habitat use by kit fox will be included in a discussion of the survey results and if possible, will include an assessment of the potential impacts on kit fox by proposed project activities. The status of all kit fox dens will be determined and mapped. If occupied dens are detected, each den will be classified as a known, potential, atypical, or natal/pupping den.

4.1.1 Survey Methodology

The Designated Biologist and/or Biological Monitors will conduct pedestrian transect surveys that achieve 100 percent visual coverage for potential San Joaquin kit fox dens in the project area, including areas within 200 feet of all project facilities, utility corridors, and access roads. Ground burrows with openings between 4 and 12 inches in diameter for a minimum of 36 inches in depth will be evaluated for evidence of San Joaquin kit fox occupation. To determine the presence of San Joaquin kit fox, the potential den will be fully excavated to the end by either hand or machinery. Once determined empty, the den will be filled with dirt and compacted to ensure that San Joaquin kit fox cannot enter or use the den during the construction period.

If any potential den is determined to be currently or previously used by San Joaquin kit fox, measures for natal and non-natal dens (as applicable) will be followed. Any natal dens encountered will be avoided by a minimum of 100 feet for known dens and a minimum of 50 feet for potential dens. Non-natal dens will be monitored for a minimum of three days to determine their current use.

4.2 Avoidance

4.2.1 Exclusion Zones

The configuration of exclusion zones around the San Joaquin kit fox dens will have a radius measured outward from the entrance or cluster of entrances. The following radii are minimums, and if they cannot be followed the USFWS and CPM (in coordination with CDFG) will be contacted.

- Known den: To ensure protection, a 100-foot exclusion zone will be demarcated by fencing that encircles each den and does not prevent access to the den by San Joaquin kit foxes. Exclusion zone fencing will be maintained until all construction-related disturbances have been terminated. At that time, all fencing will be removed to avoid attracting subsequent attention to the dens.
- Potential or Atypical Den: Placement of 4 to 5 flagged stakes 50 feet from the den entrance(s) will identify the den location; fencing will not be required, but the exclusion zone will be observed.
- Natal/pupping den (occupied and unoccupied): USFWS and the CPM (in coordination with CDFG) will be contacted by the Designated Biologist for further direction.

Construction and other project activities will be prohibited or greatly restricted within the exclusion zones. Only essential vehicle operation and foot traffic on existing county roads will be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity will be prohibited within the exclusion zones.

4.3 Den Destruction

Disturbance of all San Joaquin kit fox dens will be avoided to the maximum extent possible. Protection provided by San Joaquin kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species. Limited destruction of San Joaquin kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed.

Potential, known, and/or occupied San Joaquin kit fox dens will not be destroyed unless Mariposa Energy has obtained an Incidental Take Statement from USFWS and prior authorization from the CPM (in consultation with CDFG). The following measures will be implemented for any natal/pupping dens, active dens (non-natal), and potential dens observed during preconstruction project surveys:

1. Natal/pupping dens will be avoided, and USFWS and the CPM (in coordination with CDFG) contacted for further guidance. Natal/pupping dens will not be disturbed by project-related activities.

2. Known dens (if any) will be surveyed for three days with tracking medium or an infrared beam camera to determine the current use. If no San Joaquin kit fox activity is observed during this period, the den will be destroyed immediately to preclude subsequent use. If San Joaquin kit fox activity is observed at the den during this period, the den will be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied will the den be excavated under the direction of the Designated Biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of Designated Biologist, it is temporarily vacant, for example during the animal's normal foraging activities. CEC staff, USFWS, and CDFG encourage hand excavation, but realize that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.
3. Destruction of potential dens will be accomplished by careful excavation under the direct supervision of the Designated Biologist or Biological Monitor until it is certain that no San Joaquin kit foxes are inside. Either by using hand tools or small machinery (for example, mini excavator), the den will be fully excavated, filled with dirt and compacted to ensure that San Joaquin kit foxes cannot reenter or use the den during the construction period. If any den was considered unoccupied, but upon commencement of den destruction determined to be occupied, den destruction will cease and the CPM (in coordination with CDFG) and USFWS will be notified immediately. Monitoring of the den as described in item #2 above may be allowed to resume, as determined during consultation with the agencies. Destruction of the den would be completed when in the judgment of the Designated Biologist, the animal has escaped from the partially destroyed den.

4.4 Construction and Operational Requirements

Habitat subject to permanent and temporary construction disturbances and other types of project-related disturbance will be minimized. Project designs have limited or clustered permanent project features to the smallest area possible while still permitting project goals to be achieved. To minimize temporary disturbances, all project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas will also be included in preconstruction surveys and, to the extent possible, will be established in locations disturbed by previous site actions to prevent further impacts. The following measures will also be implemented:

1. If construction personnel encounter a San Joaquin kit fox or any animal that construction personnel believe may be a San Joaquin kit fox, the following protocol will be followed:
 - a. All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.
 - b. The construction manager will be immediately notified.
 - c. The construction manager will notify the onsite Designated Biologist or Biological Monitor.

- d. The animal will be allowed to leave the site on its own.
2. Before any ground is disturbed, the boundaries of the construction zone will be clearly delineated with orange-colored plastic construction fencing or solid barriers (for example, a wildlife exclusion fence) to discourage workers or equipment from inadvertently straying from the project area.
3. Project-related vehicles will observe a 10-mph speed limit in all project areas, except on county roads and state and federal highways; this is particularly important at night when San Joaquin kit foxes are most active. To the extent possible, night-time construction will be minimized. Off-road traffic outside of designated project areas will be prohibited.
4. To prevent inadvertent entrapment of San Joaquin kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped or injured San Joaquin kit fox is discovered, the procedures under item #13 below will be followed.
5. San Joaquin kit foxes are attracted to den-like structures such as pipes and may enter stored pipe becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for San Joaquin kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until USFWS and the CPM (in coordination with CDFG) have been consulted. If necessary, and under the direct supervision of the Designated Biologist or Biological Monitor, the pipe may be moved once to remove it from the path of construction activity, until the San Joaquin kit fox has escaped.
6. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a week from a construction or project site.
7. No firearms will be allowed on the project site.
8. To prevent harassment, mortality of San Joaquin kit foxes, or destruction of dens by dogs or cats, no pets will be permitted on project sites.
9. The Designated Biologist will be the contact source for any employee or contractor who might inadvertently kill or injure a San Joaquin kit fox or who finds a dead, injured or entrapped individual, including animals struck by project vehicles.
10. An employee education program will be conducted which consists of a presentation by persons knowledgeable in San Joaquin kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and agency personnel involved in the project. The program will include the following: a description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of San Joaquin kit fox in the project area; an explanation of the status of the species and its protection

under the federal ESA and CESA; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information will be part of the education program for distribution to the above-mentioned individuals and anyone else who may enter the project site.

11. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, pipeline corridors, etc. will be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to “temporary” disturbance means any area that is disturbed during project construction, but that after completion of project construction will not be subject to further disturbance and has the potential to be revegetated.
12. In the case of trapped animals, escape ramps or structures will be installed immediately to allow the animal(s) to escape, or USFWS and the CPM (in coordination with CDFG) will be contacted for advice.
13. USFWS and the CPM (in coordination with CDFG) will be notified immediately within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Room W-2605, Sacramento, CA 95825, (916) 414-6600. The CDFG contact for immediate assistance is State Dispatch at (831) 649-2817. They will contact the local warden or biologist and also contact Mr. Liam Davis at P.O. Box 47, Yountville, California, 94599, (707) 944-5529 and Ms. Marcia Grefsrud at P.O. Box 47, Yountville, California 94599, (707) 944-5559.

5.0 Monitoring

The mitigation measures presented in this plan are designed to minimize or eliminate the potential adverse impacts of the project on San Joaquin kit fox. Ultimately, USFWS and the CPM (in consultation with CDFG) must approve this plan before it is implemented onsite. To assess the effectiveness of the proposed mitigation measures, monitoring is included as part of this plan. The Designated Biologist or Biological Monitor will conduct daily or as-needed (depending on site activities and season) onsite monitoring visits following the preconstruction survey until the completion of all project work areas. In addition to enforcement of den avoidance, the onsite biologists will also monitor any inactive construction areas for presence of kit fox. Because not all project areas will be simultaneously disturbed during the 14-month construction period, kit fox may establish a den in an inactive construction area or immediately nearby (for example, within 200 feet). Kit fox could also enter the construction site. The Designated Biologist will provide the results of the monitoring surveys to USFWS and the CPM (in coordination with CDFG) in monthly compliance reports. Any agency-approved remedial actions will be implemented immediately and monitored for their success by the Designated Biologist or Biological Monitor.

6.0 Reporting

Any injuries, mortality, or other unforeseen circumstances regarding San Joaquin kit fox will be reported to the USFWS and CPM (in coordination with CDFG) within 24 hours.

Construction monitoring and the results of kit fox monitoring will be reported on a monthly basis by the Designated Biologist.

A construction termination report written by the Designated Biologist will also be provided to USFWS and the CPM (in coordination with CDFG) within 30 days after completion of project construction. The report will identify when surveys were completed, survey observations, how mitigation measures were implemented, any remedial actions taken, how the measures were completed, and the results of the mitigation.

All monitoring reports will generally include the following information:

- Date and time of monitoring including, weather and visibility conditions, and methodology
- Description of the site including location, size, topography, vegetation communities and wildlife observed
- Photographs of the site
- A map showing the location of all identified kit fox burrow types
- Names of biologists conducting the monitoring

7.0 Success Criteria

Plan success is defined as no active San Joaquin kit fox dens marked for avoidance were impacted and no kit fox were directly or indirectly harmed during construction. These criteria apply to the project, during the entire 14-month construction period.

8.0 Adaptive Management

To manage any unforeseen conditions that may arise, adaptive management may be required to ensure that the success criteria are met. Adaptations may include implementing new mitigation measures as appropriate based on the actual effects of the project on San Joaquin kit fox.

During construction, Mariposa Energy will work collaboratively with USFWS and the CPM (in consultation with CDFG) to ensure that the most effective and reliable mitigation measures are implemented for the protection of active dens and individual kit fox. Adaptive management measures may include more stringent no-work offsets and constant construction monitoring of active den locations.

9.0 References

California Department of Fish and Game (CDFG). 2011. Online Information.
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U.S. Fish and Wildlife Service (USFWS). 1998. Recovery plan for upland species of the San Joaquin Valley, California. Region 1, Portland, OR. 319 pp.