



B. Morse Peterson, U.S. Fish and Wildlife Service

The San Joaquin kit fox is an *endangered species*. Endangered species are plants and animals that are in immediate danger of becoming extinct.

Threatened species are plants and animals whose population numbers are so low that they may become endangered in the future.

The U.S. Environmental Protection Agency's (EPA) Endangered Species Protection Program (ESPP) will help ensure that pesticide use does not jeopardize the survival of listed species.

Vulpes macrotis mutica

San Joaquin Kit Fox *Vulpes macrotis mutica*

Description and Ecology

Status Endangered, listed March 11, 1967.

Critical Habitat Not designated.

Appearance The average male San Joaquin kit fox measures about 32 inches in length (of which 12 inches is the length of its tail). It stands 12 inches high at the shoulder, and weighs about 5 pounds. The female is a little smaller. The San Joaquin kit fox is the smallest canid species in North America (but the largest kit fox subspecies). Its foot pads are also small and distinct from other canids in its range, averaging 1.2 inches long and 1 inch wide. The legs are long, the body slim, and the large ears are set close together. The nose is slim and pointed. The tail, typically carried low and straight, tapers slightly toward its distinct black tip.

The coat colors of San Joaquin kit foxes vary by range and season. Simply, the summer coats are tan and the winter coats are greyed. The colors will actually range from buff, tan, and yellowish-grey to grizzled. Black guard hairs contribute to the grizzled appearance. The body undersides vary from buff to white. The external ear flap is dark on the back sides while the ear's forward-inner border and base has distinct white hairs.

Range The San Joaquin kit fox inhabited much of California's San Joaquin Valley prior to 1930. Its range extended from southern Kern County north to eastern Contra Costa County on the Valley's west side and to Stanislaus County on the east side. By 1930 its range may have been reduced to half, mostly in the southern and western San Joaquin Valley and foothills. In 1979 only 6.7% of land south of Stanislaus County remained undeveloped. Today the San Joaquin kit fox inhabits a highly fragmented landscape of scattered remnants of native habitat and adoptable, altered lands within and on the fringe of development. The largest extant populations are in western Kern County on and around the Elk Hills and Buena Vista Valley and in the Carrizo Plain Natural Area in San Luis Obispo County. The most northerly

current distribution records include the Antioch area of Contra Costa County.

Habitat Because the San Joaquin kit fox requires dens for shelter, protection and reproduction, a habitat's soil type is important. Loose-textured soils are preferable, but modification of the burrows of other animals facilitates denning in other soil types. The historical native vegetation of the Valley was largely annual grassland ("California Prairie") and various scrub and subshrub communities. Vernal pool, alkali meadows and playas still provide support habitat, but have wet soils unsuitable for denning. Some of the habitat has been converted to an agricultural patchwork of row crops, vineyards, orchards and pasture. Other habitat has been converted to urban areas and roads, wind farms, and oil fields. San Joaquin kit foxes can use small remnants of native habitat interspersed with development provided there is minimal disturbance, dispersal corridors, and sufficient prey-base.

Reproduction and Life Cycle San Joaquin kit foxes can breed at one year of age. The male and female may stay together the full year but may not necessarily den together. Home ranges vary from 1 to 12 square miles. Each kit fox may use several dens in a season and change dens often. In September and October, the female focuses on preparing the pupping den. Mating can occur from December to March, and the pups will be born after a 48-52 day gestation period. The male will provide most of the female's food while she is lactating.

The pups venture outside of their den for the first time when they are a little more than a month old. Though the San Joaquin kit fox is nocturnal, the pups may play just outside their den in the late afternoon. When 4-5 months old they disperse. On occasion offspring of either sex may remain to assist in the rearing of next year's litter.

San Joaquin Kit Fox

Reproductive success depends upon prey availability. The prey of the San Joaquin kit fox varies between the north, central, and southern sections of the Valley depending upon what is most available. Prey species include California ground squirrels, white-footed mice, kangaroo rats, pocket mice, San Joaquin antelope squirrels, black-tailed hares, desert cottontails, ground-nesting birds, chukar, and insects. Some vegetation, mostly grass, is also eaten. Life expectancy is 7 or 8 years in the wild.

Other predators such as the red or gray foxes, coyotes, bobcats and large raptors compete with the San Joaquin kit fox for the limited available prey. The red fox is a non-native species and is expanding its range in central California. The fact that it is a direct competitor and perhaps predator of the kit fox may be mitigated by the negative impact on the red fox by coyote. Coyotes, however, are sometimes predators of the San Joaquin kit fox as well.

Recovery Plan The U.S. Fish and Wildlife Service (FWS) developed a recovery plan for upland species of the San Joaquin Valley, California in 1998. The San Joaquin kit fox is included in this Recovery plan. Recovery plans outline reasonable actions that FWS believes are required to recover or protect listed species. FWS prepares recovery plans, sometimes with the assistance of recovery teams, contractors, state agencies, and others. Recovery plans do not necessarily represent the views nor the official positions or approvals of any individuals or agencies, other than FWS, involved in the plan formulation. Approved recovery plans are subject to modification as dictated by new findings, changes in species' status, and the completion of recovery tasks.

San Joaquin Kit Fox Information Sources

Primary Reference Beacham, Walton, Castronova, Frank F., and Sessine, Suzanne (eds.), 2001. *Beacham's Guide to the Endangered Species of North America*, Gale Group, New York. Vol. 1, pp. 47–50.

Listing Notice U.S. Fish and Wildlife Service, 1967. Federal Register 32.
http://ecos.fws.gov/docs/federal_register/fr18.pdf

Recovery Plan U.S. Fish and Wildlife Service, 1998. Recovery Plan for Upland Species of the San Joaquin Valley, California. 340 pp.
http://ecos.fws.gov/docs/recovery_plan/980930a.pdf

Species Account U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office. http://www.fws.gov/sacramento/es/animal_spp_acct/sj_kit_fox.pdf



California ground squirrel / John J. Mosesso, NBII Image Gallery



Carrizo Plain / © 2006 Steve Matson



San Joaquin kit fox family / B. Moose Peterson, USEWS Image Library