State of California
The Resources Agency
Department of Fish and Game

DETERMINATION OF SAN JOAQUIN KIT FOX RANGE IN CONTRA COSTA, ALAMEDA, SAN JOAQUIN AND TULARE COUNTIES, 1973[1/]

by

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ABSTRACT

Specific areas inhabited by the San Joaquin kit fox (Vulpes macrotis mutica) were surveyed and located in Contra Costa, Alameda, San Joaquin and Tulare Counties. Range maps have been delineated for those areas surveyed with sightings, road-kills and active dens indicated.

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ACKNOWLEDGMENT

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RECOMMENDATIONS

Recommendations resulting from this survey include:

1. A re-definition of the San Joaquin kit fox range be done to update Laughrin's (1970) study to determine specific areas inhabited by the kit fox throughout the state. Particular attention be directed to Stanislaus, Merced, Kings, Monterey and San Benito Counties.

2. Factors which may affect San Joaquin kit fox populations including (1) the encroachment of agriculture land use, (2) illegal shooting, (3) road-kills, and (4) incidental poisoning be evaluated with alternatives or protective measures proposed to relieve these factors.

3. A training seminar held in cooperation with the California Department of Food and Agriculture and the County Agricultural Commissioners be initiated to provide field personnel with information for identifying kit fox, active dens and habitat areas.

4. A program be established in cooperation with the California Department of Food and Agriculture and the County Agricultural Commissioners whereby sighting reports and current information regarding rare or endangered wildlife can be assimilated to provide up to date progress on the status of these species.

INTRODUCTION

On May 21, 1971 the California Fish and Game Commission declared the San Joaquin kit fox (Vulpes macrotis mutica) as rare pursuant to the California Endangered Species Act of 1970. The U. S. Department of the Interior presently lists the San Joaquin kit fox as endangered in the 1973 edition of Threatened Wildlife of the United States.

Laughrin (1970) reported the distributional range of the San Joaquin kit fox to be an area extending from the Tehachapi Mountain foothills at the southern end of the San Joaquin Valley north along the western foothills of the Valley to Los Banos, and on the eastern side of the Valley north to the Porterville area. Sightings and road-kills have also indicated populations of kit foxes in the Byron area of Contra Costa County (Jensen 1972).

To provide further protection for the San Joaquin kit fox specific areas inhabited by the kit fox need to be identified and designated for the marginal areas and extensions of previously defined kit fox distribution. Field surveys were conducted in Contra Costa, Alameda, San Joaquin and Tulare Counties to determine the extent of kit fox habitat and locate active dens in these areas.

SURVEY METHODS

County Agricultural Commissioners were contacted in Contra Costa, Alameda, San Joaquin and Tulare Counties. Information that was available from these counties on San Joaquin kit fox locations was reviewed and county personnel assisted in the subsequent field surveys.

Portions of each county were surveyed on spotlight transects where lights were swept about continuously while driving along prescribed routes. Whenever an eyeshine occurred, the vehicle was stopped and an attempt was made to identify the animal. Kit fox sightings were recorded on county maps. A ground search was coordinated along the spotlight survey routes and active kit fox dens were located and recorded.

In those portions of the counties surveyed where San Joaquin kit fox are likely to occur have been designated as San Joaquin kit fox range. This range has been designated by a combination of habitat and elevation criteria. Specific areas of kit fox sightings, den locations or road kills were delineated within the designated range. These areas reflect to a greater degree the actual presence of kit fox in these counties.

SURVEY RESULTS

Contra Costa

Until Jensen's (1972) report of kit fox in the Byron area of Contra Costa County, authorities believed the range of this species to be confined to the southern and western portions of the San Joaquin Valley. Jensen (1972) reported finding three kit foxes that had been illegally trapped on a ranch south of Byron.

Kit fox range in Contra Costa is limited to the southeastern portion of the county, extending approximately two miles north and four miles west of Byron (Figure 1). The habitat defined within this range consists mostly of rolling hills covered by native annual grasses and occasional oak trees found near surface water in the canyons. The kit fox is limited to this area because of the abrupt habitat changes which occur on the east, north and west sides of this area.

Kit foxes have been sighted on several occasions in recent years by Ottis Moss of the Contra Costa County Department of Agriculture. Two kit fox carcasses were found by Gene McBroom in 1972 in an irrigation pipe near Marsh Creek Road. John Adams reported a kit fox carcass that he had found on his property at Byron Hot Springs in 1972. Two active dens were located and several sightings were made during this survey. Table 1 summarizes kit fox observations recorded on Figure 1.

TABLE 1

Summary of Kit Fox Observations
Contra Costa County, 1967-1973

1. Two carcasses found in 1972 by Gene McBroom, resident landowner.

2. Sighting, 1972, Ottis Moss, Contra Costa County Department of Agriculture.

3. Sighting[1/], April 1973, John Simmen, Contra Costa County Department of Agriculture; Craig D. Swick, California Department of Fish and Game.

4. Active den, 1972, Ottis Moss, Contra Costa County Department of Agriculture.

5. Active den, 1968, Ottis Moss, Contra Costa County Department of Agriculture.

6. Sighting[1/] and active den, April 1973, John Simmen and Ottis Moss, Contra Costa County Department of Agriculture; Craig D. Swick, California Department of Fish and Game.

1/ Sightings unconfirmed due to poor visual conditions encountered while spotlighting.

7. Sighting[1/], April 1973, Robert Schulenberg and Craig D. Swick, California Department of Fish and Game.

8. One carcass found in 1972 by John Adams, resident landowner.

9. Sighting (2 kit fox), August 1973; Ottis Moss, Contra Costa County Department of Agriculture; Craig D. Swick, California Department of Fish and Game.

10. Scats, April 1973, Craig D. Swick, California Department of Fish and Game.

11. Kit fox trapped, 1967, Ottis Moss, Contra Costa County Department of Agriculture.

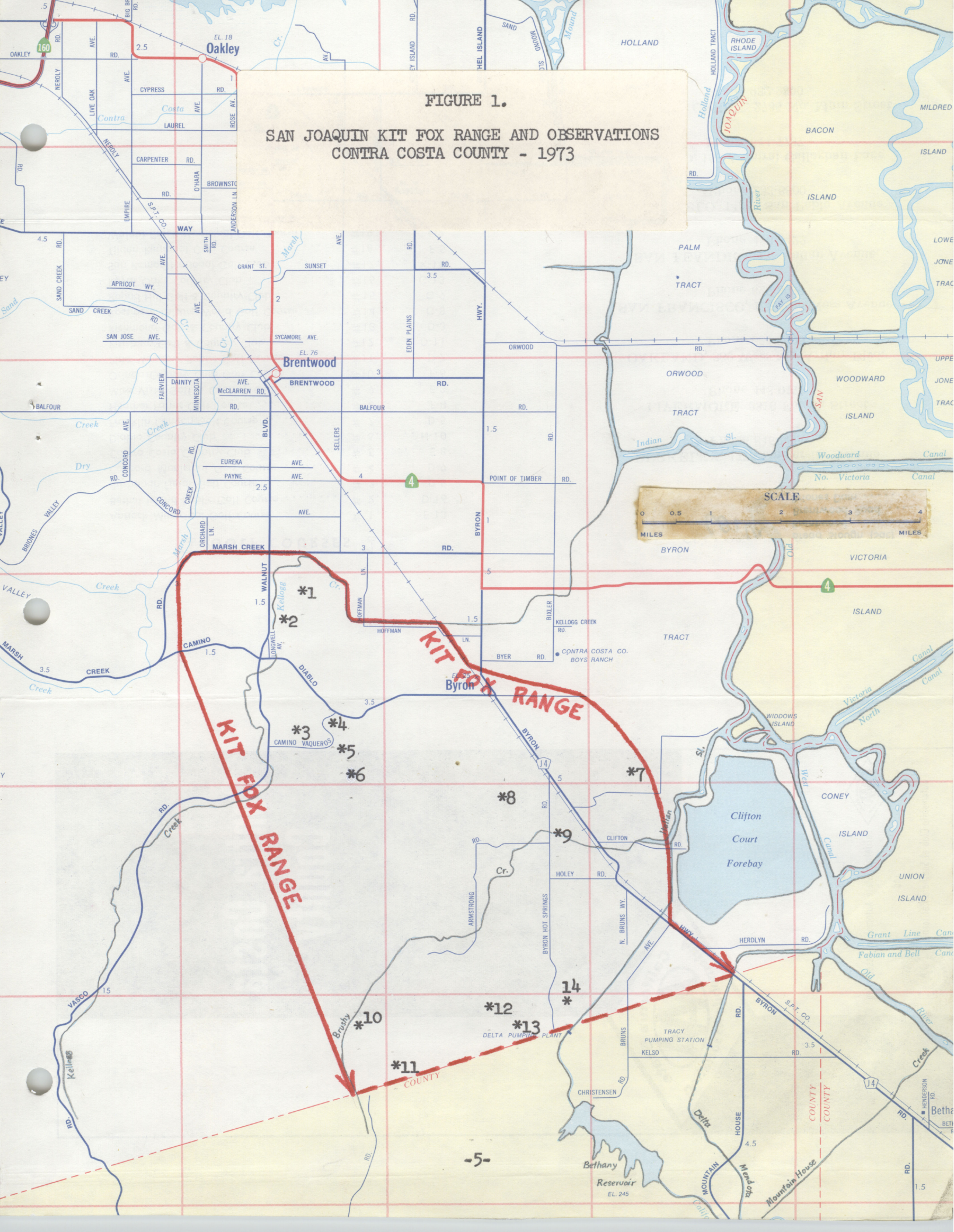
12. Three carcasses found in 1972 by Robert Schulenberg and Charles Jensen, California Department of Fish and Game.

13. Active den, April 1973, Craig D. Swick, California Department of Fish and Game.

14. Sighting, 1972, Ottis Moss, Contra Costa County Department of Agriculture.

FIGURE 1.

SAN JOAQUIN KIT FOX RANGE AND OBSERVATIONS CONTRA COSTA COUNTY - 1973



Alameda

Kit fox range in Alameda is restricted to the northeastern corner of the county, with habitat boundaries extending from Brushy Creek in Contra Costa County to one mile north of Corral Hollow Road in San Joaquin County (Figure 2). Kit fox were reported along the California Aqueduct by Chester Bush of the California Department of Water Resources. This was confirmed with the sighting of a kit fox at the intersection of Christensen Road and Bethany Reservoir (Figure 2).

During the survey conducted in Alameda County, a road-kill was found along Altamount Pass Road, and one kit fox was sighted along Patterson Pass Road (Figure 2). Otto Schmidt of the Alameda County Department of Agriculture reported an active den just north of Altamount Pass Road in 1972. Table 2 summarizes kit fox observations recorded on Figure 2.

TABLE 2

Summary of Kit Fox Observations
Alameda County, 1972-73

1. Sighting (spotlight), 1973, John Johnston, Alameda County Department of Agriculture; Jerry Clark, California Department of Food and Agriculture; Robert Schulenberg and Craig D. Swick, California Department of Fish and Game.

2. Active den, 1972, Otto Schmidt, Alameda County Department of Agriculture.

3. Road-kill, 1973, John Johnston, Alameda County Department of Agriculture; Jerry Clark, California Department of Food and Agriculture; Craig D. Swick, California Department of Fish and Game.

4. Sighting (spotlight), 1973, John Johnston, Alameda County Department of Agriculture; Jerry Clark, California Department of Food and Agriculture; Robert Schulenberg and Craig D. Swick, California Department of Fish and Game.

FIGURE 2.

SAN JOAQUIN KIT FOX RANGE AND OBSERVATIONS
ALAMEDA COUNTY - 1973

San Joaquin

Kit fox were reported to have been found as far north as Tracy in San Joaquin County by Grinnell (1937), however, until Jensen's work in 1972, it was believed that the kit fox had been eliminated from this area. Jensen reported a sighting in 1969 and a road-kill in 1971 along Corral Hollow Road.

The kit fox range in San Joaquin County as determined by this survey, indicated a narrow strip of habitat lying parallel with Interstate Highway 580 in the southwestern corner of the county. This area is bound on the southwest from just north of Corral Hollow Road in Alameda County to Hospital Creek along the Stanislaus County boundary, and along the northeast by the Delta Mendota Canal (Figure 3).

The survey in San Joaquin County revealed four active dens southwest of Interstate 580. Kit fox were sighted at three of these dens (Figure 3). Two kit fox were observed near the county disposal site along Corral Hollow Road and Frank Arbrur, a local rancher reported seeing kit fox on his ranch southwest of Interstate 580. Table 3 summarizes kit fox observations recorded on Figure 3.

TABLE 3

Summary of Kit Fox Observations
San Joaquin County, 1969-1973

1. Sighting and active den, 1973, Marvin Switzenberg and Nick Duren, San Joaquin County Department of Agriculture; Robert Schulenberg and Craig D. Swick, California Department of Fish and Game.

2. Active den, 1970, Wilfred McDaniel, San Joaquin County Department of Agriculture.

3. Active den, 1973, Marvin Switzenberg and Nick Duren, San Joaquin County Department of Agriculture; Craig D. Swick, California Department of Fish and Game.

4. Sighting, 1969, Steve Ruth, Museum of Vertebrate Zoology, Berkeley.

5. Road-kill, 1971, William Maupin, San Joaquin County Department of Agriculture.

6. Tracks and scat, 1973, Craig D. Swick, California Department of Fish and Game.

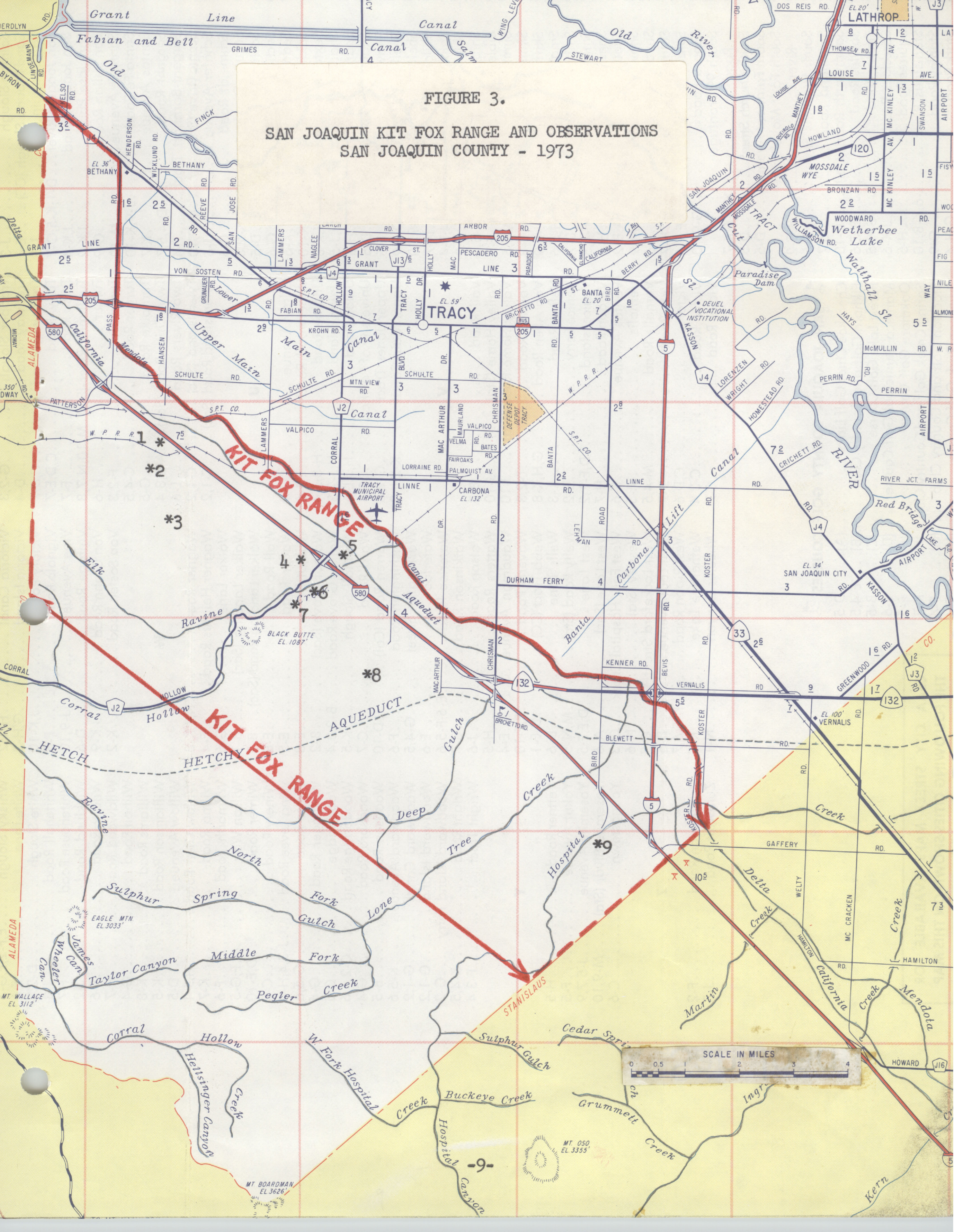
7. Sighting (2 kit fox), 1973, Marvin Switzenberg and Nick Duren, San Joaquin County Department of Agriculture.

8. Sighting and active den, 1973, William Maupin and Marvin Switzenberg, San Joaquin County Department of Agriculture; Craig D. Swick, California Department of Fish and Game.

9. Sighting and active den, 1973, Marvin Switzenberg and Nick Duren, San Joaquin County Department of Agriculture.

FIGURE 3.

SAN JOAQUIN KIT FOX RANGE AND OBSERVATIONS
SAN JOAQUIN COUNTY - 1973



Tulare

San Joaquin kit fox range in Tulare County was indicated by Laughrin (1970) extending north from Kern County to about 20 miles south of Porterville. Jensen (1972) reported two active dens south of Terra Bella, one active den on the Pixley National Wildlife Refuge and a sighting three miles west of Earlimart. These areas were confirmed during this survey and the range of the kit fox was extended both to the north and west.

The current range of the kit fox in Tulare is described in the southwestern corner of the county. The habitat area in which kit fox may be found extends from Fountain Springs to Road 252, north to Lewis Hill and then north along Highway 65 to Lindsay and north to Elderwood. The area extends west from Elderwood on Highway 201 to Road 80 and then west on Avenue 360 to the Kings County boundary.

During this survey kit fox were sighted at seven different locations, active dens were found in nine separate areas and six road-kills were recorded (Figure 4). Approximately 17 different kit foxes were observed at the seven sightings. Active dens were located in areas surrounded by intensive agriculture and one colony was found on the banks of an irrigation sump situated between a grain field and a vineyard. Table 4 summarizes the kit fox observations recorded on Figure 4.

TABLE 4

Summary of Kit Fox Observations
Tulare County, 1970-73

1. Sighting and active den, 1972, John Gilbert, Cropduster.

2. Sighting and active den, 1971, Rex Clark, Biology teacher, Dinuba High School.

3. Road-kill, 1972, Gene Smith, Biology teacher, Redwood High School.

4. Active den, 1973, George Simpson, Tulare County Agricultural Commission.

5. Active den, 1973, Bert Gayden, Tulare County Agricultural Commission.

6. Road-kill, 1973, Bill Clark, Tulare County Agricultural Commission.

7. Active dens, 1973, Bert Gayden, Tulare County Agricultural Commission.

8. Sighting (spotlight), 1973, Larry Bastian, Tulare County Agricultural Commission; Craig D. Swick, California Department of Fish and Game.

9. Sighting and active dens, 1972, Larry Bastian, Tulare County Agricultural Commission.

10. Road-kill, 1973, Tom Zickratch and Larry Bastian, Tulare County Agricultural Commission.

11. Active den, 1971, John Nagel, resident landowner.

12. Sighting, 1973, John Sisk, resident landowner.

13. Active den, 1970, Richard Callison, resident landowner.

14. Road-kill, 1973, John Sisk, resident landowner.

15. Sighting (spotlight), 1973, Larry Bastian and Tom Zickratch, Tulare County Agricultural Commission; Ken Sanger, California Department of Food and Agriculture; Craig D. Swick, California Department of Fish and Game.

16. Sightings and active dens, 1973, Bill Clark, Tulare County Agricultural Commission.

17. Pixley Wildlife Refuge, 1973, Leon Littlefield, Bureau of Sport Fisheries and Wildlife reported 2 kit fox per square mile on this 3,200 acre refuge.

18. Active dens, 1973, Larry Bastian, Tulare County Agricultural Commission; Ken Sanger, California Department of Food and Agriculture; Craig D. Swick, California Department of Fish and Game.

19. Sighting and active dens, 1972, Larry Bastian, Tulare County Department of Agriculture; Charles Jensen, California Department of Fish and Game.

20. Active dens, 1973, Larry Bastian, Tulare County Department of Agriculture; Craig D. Swick, California Department of Fish and Game.

21. Active dens, 1971, Larry Bastian, Tulare County Agricultural Commission.

22. Sighting (spotlight) and active dens, 1973, Bill Clark and Larry Bastian, Tulare County Agricultural Commission; Ken Sanger, California Department of Food and Agriculture; Craig D. Swick, California Department of Fish and Game.

23. Road-kill, 1973, Larry Bastian and Roger Brown, Tulare County Agricultural Commission.

24. Sighting and active dens, 1973, Bill Clark, Tom Zickratch and Larry Bastian, Tulare County Agricultural Commission; Ken Sanger, California Department of Food and Agriculture; Craig D. Swick, California Department of Fish and Game.

25. Sighting, 1973, Larry Bastian, Tulare County Agricultural Commission; Craig D. Swick, California Department of Fish and Game.

26. Road-kill, 1972, Larry Bastian, Tulare County Agricultural Commission; George Franklin, California Department of Fish and Game.

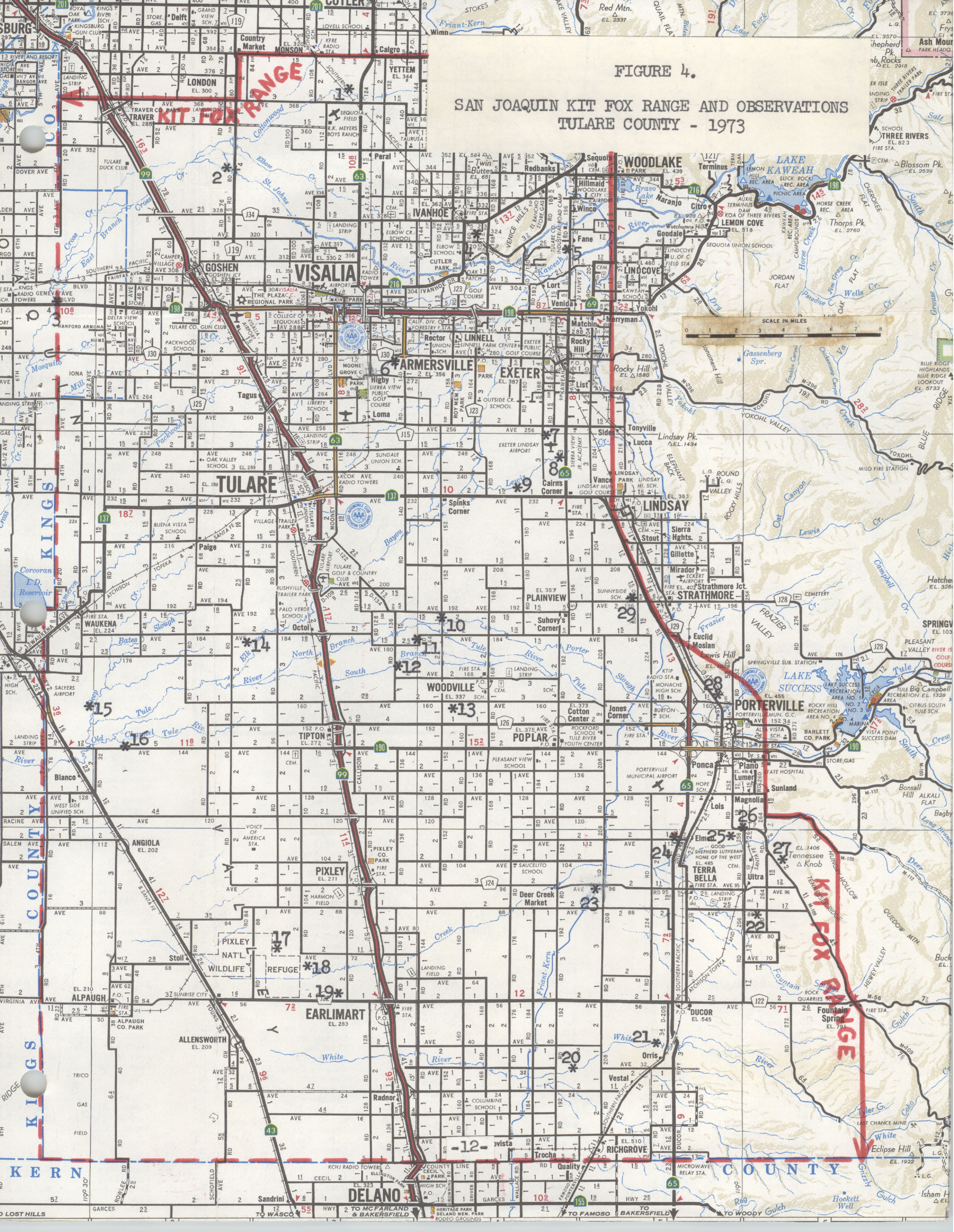
27. Road-kill, 1973, Tom Zickratch and Larry Bastian, Tulare County Agricultural Commission; Ken Sanger, California Department of Food and Agriculture; Craig D. Swick, California Department of Fish and Game.

28. Road-kill, 1973, Tom Zickratch, Tulare County Agricultural Commission.

29. Active dens, 1973, Larry Bastian and Bert Gayden, Tulare County Agricultural Commission.

FIGURE 4.

SAN JOAQUIN KIT FOX RANGE AND OBSERVATIONS
TULARE COUNTY - 1973



SURVEY CONCLUSIONS

Definite boundaries for the distribution of any animal are difficult to determine and the kit fox is no exception. To say that there are kit fox on one side of a line drawn on a map and not on the other would be a misinterpretation of the results presented. The kit fox range as indicated by this survey is only a definition of suitable habitat as is currently available in those areas. This range is not static and it could be expected to shift in either direction, dependent upon the kit foxes' ability to adapt to the changing environment.

The kit fox range in San Joaquin, Alameda and Contra Costa Counties is bound on three sides by sharp habitat differences. To the west rises the coastal mountains with scattered areas of brush and oak trees. The north is bound by the San Joaquin delta and intensive agriculture, while the eastern boundary lies along the California Aqueduct and Delta Mendota Canal. Kit fox populations in this extended area are sparse and it appears that they are quite dependent upon this narrow strip of native grassland. The kit fox should remain stable in this area unless unforeseen development drastically alters the present habitat.

Kit fox appear to be re-establishing themselves along the east side of the San Joaquin Valley. The kit fox range has been extended over 45 miles to the north and west in Tulare County by this investigation. Kit fox sighted in Tulare County were found along drainages and in native pastures scattered throughout agricultural areas. Several kit fox families were observed in intensive agricultural areas where the kit fox are co-existing with the farmer. Scats and prey items collected near these dens showed little evidence of kangaroo rats, but rabbits and small rodents associated with agricultural-land use were abundant.

Whether the abundance of kit fox in Tulare County is increasing is not clear. Leon Littlefield, refuge manager of the Pixley National Wildlife Refuge, while reporting two kit fox per square mile on the 3,200 acre refuge, has suggested that with more of the native land going into agricultural production kit fox populations are bunching together. This together with the recent efforts to locate kit fox may account for the apparent "increase" of kit fox in Tulare County.

Tulare County's Department of Agriculture has been actively searching out kit fox populations for the past several years. As a result most of the farmers and ranchers in that portion of the county where kit fox are found are aware of this species protected status. Farmers and ranchers recognize the assistance kit fox give them by hunting rodents on their property and afford them protection for this service. Continued efforts to protect the kit fox in this area should improve his chances for survival.

This survey has identified specific areas in Contra Costa, Alameda, San Joaquin and Tulare Counties inhabited by the San Joaquin kit fox. Further effort should be directed to re-define all portions of the kit fox range, especially those areas of Stanislaus, Merced, Kings, Monterey and San Benito Counties which were not previously included on other studies. Most importantly, the specific areas inhabited by kit foxes need to be determined.

The distributional range of the San Joaquin kit fox has been sized up by many wildlife authorities as diminishing and threatening the survival of this subspecies. In this respect, attention should be directed to assess those limiting factors contributing toward the threatened status of the kit fox, with alternatives or programs planned to relieve these factors.

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