2009 ANNUAL WILDLIFE MONITORING REPORT
for the
KERN WATER BANK

SUBMITTED TO:

KERN WATER BANK AUTHORITY

PREPARED BY:

svb
south valley biology consulting llc

April 13, 2010

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Submitted to:

Kern Water Bank Authority
1620 Mill Rock Way, Suite 500
Bakersfield, CA 93311

Prepared by:

South Valley Biology Consulting LLC
6510 Montagna Drive
Bakersfield, CA 93306

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1.0 INTRODUCTION

This report documents the results of the 2009 annual wildlife monitoring activities conducted at the Kern Water Bank (KWB). On behalf of the Kern Water Bank Authority (KWBA), biologists from Live Oak Associates, Inc. (LOA) conducted all monitoring activities.

As identified in the KWBA Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) (Section IV-6), the annual and bi-annual monitoring consisted of the following activities:

- San Joaquin kit fox (*Vulpes macrotis mutica*) monitoring

  Nighttime spotlighting surveys to document the presence of San Joaquin kit fox and its predators, such as coyote (*Canis latrans*) and red fox (*Vulpes vulpes*), as well as other nocturnal animals on the KWB.

- Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) monitoring

  Trapping surveys on two established trapping grids to assess known population areas of Tipton kangaroo rats on the KWB.

- San Joaquin woollythreads (*Monolopia congdonii*) and other rare plant species monitoring

2.0 SAN JOAQUIN KIT FOX MONITORING

2.1 Introduction

San Joaquin kit fox monitoring at the KWB in 2009 consisted of nighttime spotlighting surveys conducted on an established route located throughout the KWB. These surveys are conducted annually in an effort to provide an index of San Joaquin kit fox presence. Data collected from the surveys have proven useful in supplying insights into the densities of not only kit foxes, but also their predator and competitor species within the boundaries of the KWB. The main predator/competitor species for the San Joaquin kit fox on the KWB is the coyote and bobcat. Another species that is occasionally observed on the KWB is the red fox, although no red foxes have been observed during the nighttime spotlighting surveys for several years now.

2.2 Methodology

Lesser-travelled areas of the established nighttime spotlighting route are routinely driven and sometimes walked during daylight hours prior to conducting the nighttime spotlighting surveys as a precautionary measure. This was done once again in 2009, primarily for safety reasons. During these pre-survey investigations, no hazards or significant obstructions were observed. As a result, no significant alterations to the established route were required. Figure 1 provides an illustration of the 2009 survey route.

Nighttime spotlighting surveys were conducted for six nights during the evening and nighttime hours ranging from 5:10 pm to 10:00 pm on September 30th, October 1st and 28th, November 11th, and December 21st and 29th. Because the established survey route is just over 50 miles in length, it was divided into roughly two equidistant portions totaling approximately 25 miles each (Figure 1). The East Route consisted of all portions lying east of Enos Lane (a.k.a. Highway 43) and an approximately 6-mile stretch lying west of Interstate 5 and south of the Kern River. The other route, referred to as the West Route, encompassed all remaining portions of the established route that lie west of Enos Lane. Both routes were surveyed equally over the six nights, yielding approximately 150 miles of nighttime spotlighting surveys conducted during this survey effort on the KWB in 2009.

Two biologists conducted the surveys while travelling in a vehicle at approximately 5-10 miles per hour. Each biologist used a 3-million candlepower hand-held spotlight to observe wildlife. Double counting of observations was avoided by both observers maintaining a constant communication while surveying. Observations of all animal species were recorded onto standardized field data sheets. The data sheets were later compiled into a Microsoft Access® database. All San Joaquin kit fox observations and observations of kit fox predator and competitor species, such as coyote and bobcat (*Felis rufus*) were recorded onto a field map at the time of the survey and then compiled into the database at a later date.

2.3 Results

Results from the nighttime spotlighting surveys are presented in Figure 2. The locations of San Joaquin kit fox and competitor/predator species observations are presented in Figure 1.

One potential San Joaquin kit fox observation was made on December 21st approximately ¼ mile north of Panama Lane and 150 feet west of the eastern boundary of the KWB in the northeast ¼ of the southeast ¼ of Section 20, Township 30 South, Range 26 East, (MDB&M) (Figure 1). This observation was of one animal that was very likely an adult San Joaquin kit fox, based upon the animal's size, coloration, and movements; however, a positive identification of the animal was not possible.

A total of 12 coyotes were observed during the surveys. All observations were of adults. Most observations consisted of a single individual (9 observations); however, one observation consisted of 3 coyotes in a single group (Figure 1).

Only one bobcat was observed during the 2009 nighttime spotlighting surveys. The bobcat was an adult that was observed lying down rather comfortably at the edge of a densely vegetated area near the Interstate 5 south overpass, north of the Kern Water Bank Canal.

Other notable mammalian species observed during the 2009 nighttime spotlighting surveys were: 174 desert cottontails (*Sylvilagus audubonii*), 71 black-tailed jackrabbits (*Lepus californicus*), 17 kangaroo rats (*Dipodomys* ssp.), 2 raccoons (*Procyon lotor*), and 5 striped skunks (*Mephitis mephitis*).

A total of 19 barn owls (*Tyto alba*) and 3 burrowing owls (*Athene cunicularia*) were observed throughout the KWB during the 2009 nighttime spotlighting surveys. Several other bird species including black-necked stilt (*Himantopus mexicanus*), California quail (*Callipepla californica*), great blue heron (*Ardea herodias*), killdeer (*Charadrius vociferus*), and lesser nighthawk (*Chordeiles acutipennis*), were also observed during the surveys.

2.4 Discussion

No problems or difficulties with the surveys were encountered in 2009. Views were unobstructed and no changes in timing of methodologies of the nighttime spotlighting surveys were required. In general, observations of most species were down from what were made in 2008. Presumably, the continuing drought conditions and lack of water flows into the recharge ponds and water conveyances was a major factor in these results.

It is unfortunate that a positive determination of the potential San Joaquin kit fox observation made on December 21, 2009 was not possible. This animal caught the eye of the biologists because its body movements were characteristic of a fox, very sleek and smooth, as opposed to the other canids in the area that are commonly observed. As the vehicle approached this animal it was easy to see that it was of the appropriate size and overall coloration to be an adult kit fox. The animal was approximately 150 feet away (normally well within range to make a positive identification), however, attempts to illuminate the entire animal in an effort to see one or more other diagnostic characters (e.g., relative size of ears, black-tipped tail, ratio of body length to tail length, etc.), were only briefly possible due to a scattered shrub cover between the animal and the biologists. One of the biologists was confident that it was indeed a kit fox; however the second biologist could not concur, as he was not in as good a position to observe the animal as well. The consensus is that the animal was very likely an adult San Joaquin kit fox. If that is the case, it would be the second year in a row that a kit fox was observed on the KWB during nighttime spotlighting surveys (LOA 2009).

Only 12 coyote observations were made during the 2009 nighttime spotlighting surveys at the KWB. This represents a continued decrease from the all-time high of 39 coyote observations made during the nighttime spotlighting surveys conducted at KWB in 2006 (Quad Knopf 2007), and a decrease of 52% from the 25 that were observed last year during the 2008 nighttime spotlighting surveys (LOA 2009). Although coyotes are routinely observed over much of the KWB, even this resilient and highly adaptable species appears to have been impacted by the current drought cycle.

One bobcat was observed during the 2009 nighttime spotlighting surveys at the KWB. Generally, only a couple of bobcats are observed during the nighttime spotlighting surveys so the single animal observed in 2009 probably is not indicative of any trend in the numbers of this species on the KWB. Additionally, it is worth noting that several more incidental observations of bobcats were made during other monitoring activities in 2009. Bobcats are relatively commonly observed on the KWB in areas adjacent to the Kern River and along much of the KWB Canal.

3.0 TIPTON KANGAROO RAT MONITORING

3.1 Introduction

Tipton kangaroo rat monitoring at the KWB consists of annual trapping surveys conducted at two permanently established trapping grids. The HCP/NCCP specifies that the grids are to be located in areas that are known to support Tipton kangaroo rats. The Strand Grid is located in the northwest ¼ of Section 7, Township 30 South, Range 26 East, and the Taft Highway Grid is located in the northeast ¼ of Section 36, Township 30 South, Range 25 East (Figure 1).

3.2 Methodology

The Strand and Taft Highway grids are standard 110-meter by 110-meter, 144 station, small mammal trapping grids. Each grid consists of twelve equidistant rows, spaced 10 meters apart. Monitoring efforts at the grids were concentrated on one grid at a time and concluded when four successive nights of trapping had been completed. Trapping was conducted on August 4th, 5th, 6th, and 7th at the Taft Highway Grid and September 22nd, 23rd, 24th, and 25th at the Strand Grid. This technique yielded a total of 576 trap nights at each grid for a total of 1,152 trap nights for the entire monitoring effort.

A Sherman live trap was placed at each trap location and was baited using a peanut butter-coated birdseed mix. A wadded paper towel was also included in each trap in an effort to provide insulation material for the captured animals. The traps were baited and set in the evening and checked prior to sunrise the following morning. Two biologists worked independently on separate trap rows and checked 72 traps each morning at each grid. This technique was utilized in an effort to help reduce the handling time and minimize stress to the captured animals. Each captured animal was identified to species and their weight, age and sex were also recorded onto a standardized datasheet. After all data was collected and recorded, the animal was temporarily marked on its abdomen with a non-toxic ink marker and then the animal was released.

3.3 Results

Results from the 2009 Tipton kangaroo rat monitoring are summarized in Figure 3.

Four Tipton kangaroo rats were captured at the Strand Grid; two individuals each on September 22nd and 23rd. All animals were adults. Three were females and one was a male.

A total of 52 individual Heermann's kangaroo rats (*Dipodomys heermanni*) were captured during the 2009 Tipton kangaroo rat monitoring effort. Thirty-seven individuals were captured at the Strand Grid, while 15 individuals were trapped at the Taft Highway Grid.

One Tulare grasshopper mouse (*Onychomys torridus tularensis*) was captured at the Strand Grid and 7 San Joaquin pocket mice (*Perognathus inornatus*) were captured at the Taft Highway Grid.

Numerous deer mice (*Peromyscus maniculatus*) were also trapped during the 2009 Tipton kangaroo rat monitoring effort (at total of 110 captures); however, no attempt to handle this species was made, and all individuals were released immediately. Therefore, it should be noted that the 110 total captures also includes recaptures.

3.4 Discussion

Overall, the numbers of both kangaroo rat species trapped on the KWB were higher in 2009. Only 22 Heermann's kangaroo rats were trapped in 2008 (all at the Strand Grid), which translates to an increase of slightly over 61% at the Strand Grid and an increase of over 136% for both Grids combined. Neighboring Coles Levee Ecosystem Preserve (CLEP) also experienced a large increase (over 203%) in the number of Heermann's kangaroo rats trapped for the same period (LOA 2010, in preparation). Tipton kangaroo rats captured at CLEP in 2009 increased over 44% from what were captured in 2008 (LOA 2010, in preparation). The 4 individual Tipton kangaroo rats trapped at the Strand Grid were the first captured since 2006 when 2 individuals were trapped (Quad Knopf 2007). Reasons for the increases are unclear, however, it is interesting to note that precipitation also increased significantly over the same period. The 2008 rain year (October 1, 2007 – September 30, 2008) saw only 1.77 inches of rainfall, while 5.10 inches of rain fell during the 2009 rain year (October 1, 2008 – September 30, 2009). Precipitation levels have long been correlated with fluctuations in the numbers of kangaroo rats on the KWB and elsewhere, and it is likely that the large increase in precipitation from 2008 to 2009 was the driving factor in the increases observed in the number of both kangaroo rat species captured in 2009.

One other factor that may have benefitted Tipton kangaroo rats occurring at the Strand Grid is the managed livestock grazing program. The Strand Grid is often plagued with areas dominated by Russian thistle (*Salsola tragus*) drifts and at times becomes somewhat overgrown with this species and other rank vegetation. Limited cattle grazing for the past two seasons in the area has opened up more of this grid to potential kangaroo rat presence by helping to knock down some of the drifts and by removing some of the overgrowth of herbaceous cover. However, this may only be an artifact, since no grazing occurred at CLEP during the same period and the numbers of Tipton kangaroo rats also increased significantly. It is perhaps most accurate that the precipitation was the major factor, however, it is also reasonable to suggest that absent the

grazing program, the vegetation on the Strand Grid may have became prohibitively dense for Tipton kangaroo rats.

Tipton kangaroo rats have not been reported on the Taft Highway Grid for many years, and factually, may never have been trapped at the Taft Highway Grid. Although the habitat appears to be very suitable for this species at the Taft Highway Grid, no Tipton kangaroo rats have been captured during the annual trapping effort. The primary objectives of the annual Tipton kangaroo rat monitoring effort are to index this species and track population trends in areas where Tipton kangaroo rats are known to occur. Because no Tipton kangaroo rats are ever captured at the Taft Highway Grid, no indices or trends have ever been able to be reported. As a result, it would seem that continuing to include the Taft Highway Grid in the annual monitoring effort will not accomplish the specified objectives. As has been indicated in several prior annual wildlife monitoring reports, there are many other areas within the KWB conservation lands that provide suitable habitat for the Tipton kangaroo rat. Two of these areas have been suggested as possible alternative sites for monitoring this species (LOA 2009). The area immediately to the north of the Taft Highway Grid may be the most promising and the conservation bank lands that border the Ten Section Oilfield also appear to have high potential for Tipton kangaroo rat presence.

For 2010, it is recommended that rather than conducting annual trapping once again at the Taft Highway Grid, an investigative trapping effort in one or both of these areas be conducted as an alternative. The objective would essentially be to establish presence of this species in accordance with the HCP/NCCP and then establish a permanent grid location that would replace the unoccupied Taft Highway Grid. The new grid would then be monitored annually with the Strand Grid to provide index and population trend information on Tipton kangaroo rats at KWB.

4.0 SENSITIVE HABITAT BOTANICAL MONITORING

At least four special-status plant species are known to occur at the KWB. These are: Hoover's woolly-star (*Eriastrum hooveri*), San Joaquin woollythreads (*Monolopia congdonii*), recurved larkspur (*Delphinium recurvatum*), and slough thistle (*Cirsium crassicaule*). In addition, the KWB contains habitat for several other special-status plant species (see KWBA HCP/NCCP, Volume II, Section III-1).

One extant population of San Joaquin woollythreads that is located in the northwest ¼ of Section 7 has been monitored annually by conducting site visits during the blooming period (typically late February to early April) and collecting basic data such as the number of individual plants, vigor and phenological stage at the time of the site visit. This population has varied in number from year to year, from no individuals being observed in very dry years, to as many as 200 or more in more favorable years. In 2008 only one plant was observed and the plant did not produce any flower heads prior to senescence (LOA 2009). San Joaquin woollythreads is an annual species that is known to be highly dependent upon adequate precipitation for germination and growth (USFWS 1998). For the 2007 – 2008 rain year (October 1, 2007 – September 30, 2008) in the Bakersfield area, the total precipitation was only about 29% of normal. In 2009, precipitation was higher at about 83% of normal. Although precipitation was higher, only one plant was again observed at this location. However, the plant did produce one flower head.

As indicated in LOA (2009), many other areas on the KWB support suitable habitat for San Joaquin woollythreads. Effort was placed on visiting many of these areas in February and March of 2009 in an attempt to identify additional occurrences of this species on the KWB. Three other occurrences of San Joaquin woollythreads were identified during this effort; two of the occurrences were found on the KWB and one occurrence was located near the eastern boundary of the KWB, on property owned by the City of Bakersfield. The locations of all occurrences of San Joaquin woollythreads observed in 2009 are identified on Figure 1. The western-most occurrence contained approximately 100 plants, the eastern occurrence contained only about 15 plants, and the occurrence located on the City of Bakersfield property was comprised of about 25 plants. All plants at all these locations were healthy, vigorous and in full bloom when they were visited from March 10 – March 13, 2009.

One occurrence of recurved larkspur was found in one of the Sensitive Habitat areas of the KWB in the southern ½ of Section 36, north of Taft Highway, west of Interstate 5, just west of the Alejandro Canal. This is one of two historical occurrences reported in the CNDDB (2009); however this is the first time in several years that any individuals have been observed. The site is located on a crude oil pipeline right-of-way, under electrical transmission lines, in clay soils with alkali sink scrub vegetation. Approximately 50 plants were observed in full bloom on March 12, 2009.

Many occurrences of Hoover's woolly-star are known on the KWB and several of the larger occurrences were visited in April 2009. Most of the occurrences contained many hundreds of individuals in full bloom, with some individuals already setting seed.

In 2009, several occurrences of Horn's milk-vetch (*Astragalus hornii* var. *hormii*) were observed in some of the recharge basins and canals on the KWB. Native habitat for this species consists of lake margins, meadows, seeps, etc. with alkaline conditions. Apparently, this species has adapted to similar conditions provided by the recharge basins and canals on the KWB. Occurrences observed in the summer and fall of 2009 varied from a few individuals to 50 or more plants in a basin. Because of the limited occurrence information on this species in the CNDDB, effort will be placed upon mapping the locations of this species on the KWB during the 2010 monitoring season.

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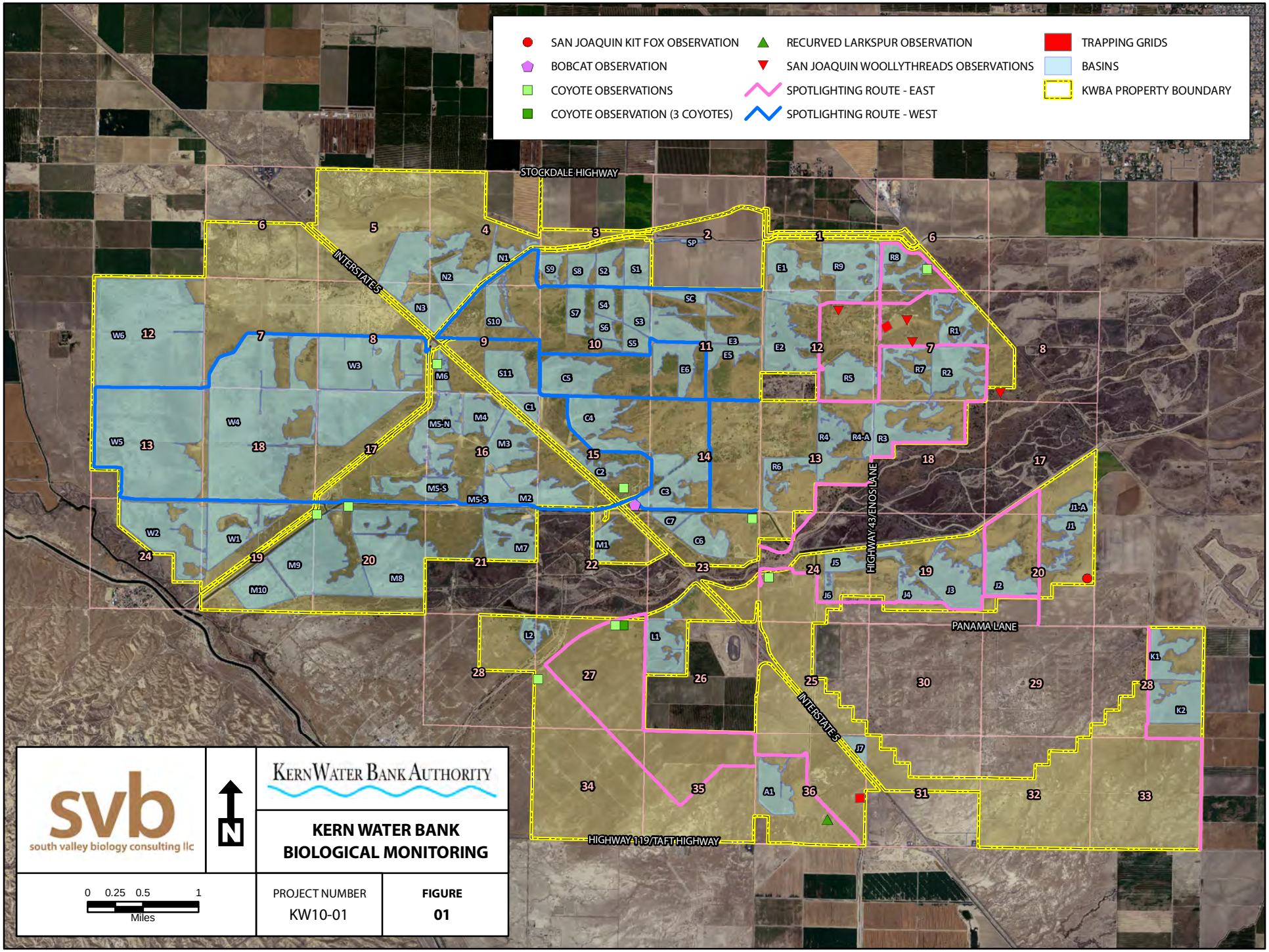
SAN JOAQUIN KIT FOX OBSERVATION
BOBCAT OBSERVATION
COYOTE OBSERVATIONS
COYOTE OBSERVATION (3 COYOTES)
RECURVED LARKSPUR OBSERVATION
SAN JOAQUIN WOOLLYTHREADS OBSERVATIONS
SPOTLIGHTING ROUTE - EAST
SPOTLIGHTING ROUTE - WEST
TRAPPING GRIDS
BASINS
KWBA PROPERTY BOUNDARY
STOCKDALE HIGHWAY
INTERSTATE 5
HIGHWAY 43/ENOS LANE
PANAMA LANE
HIGHWAY 119/TAFT HIGHWAY
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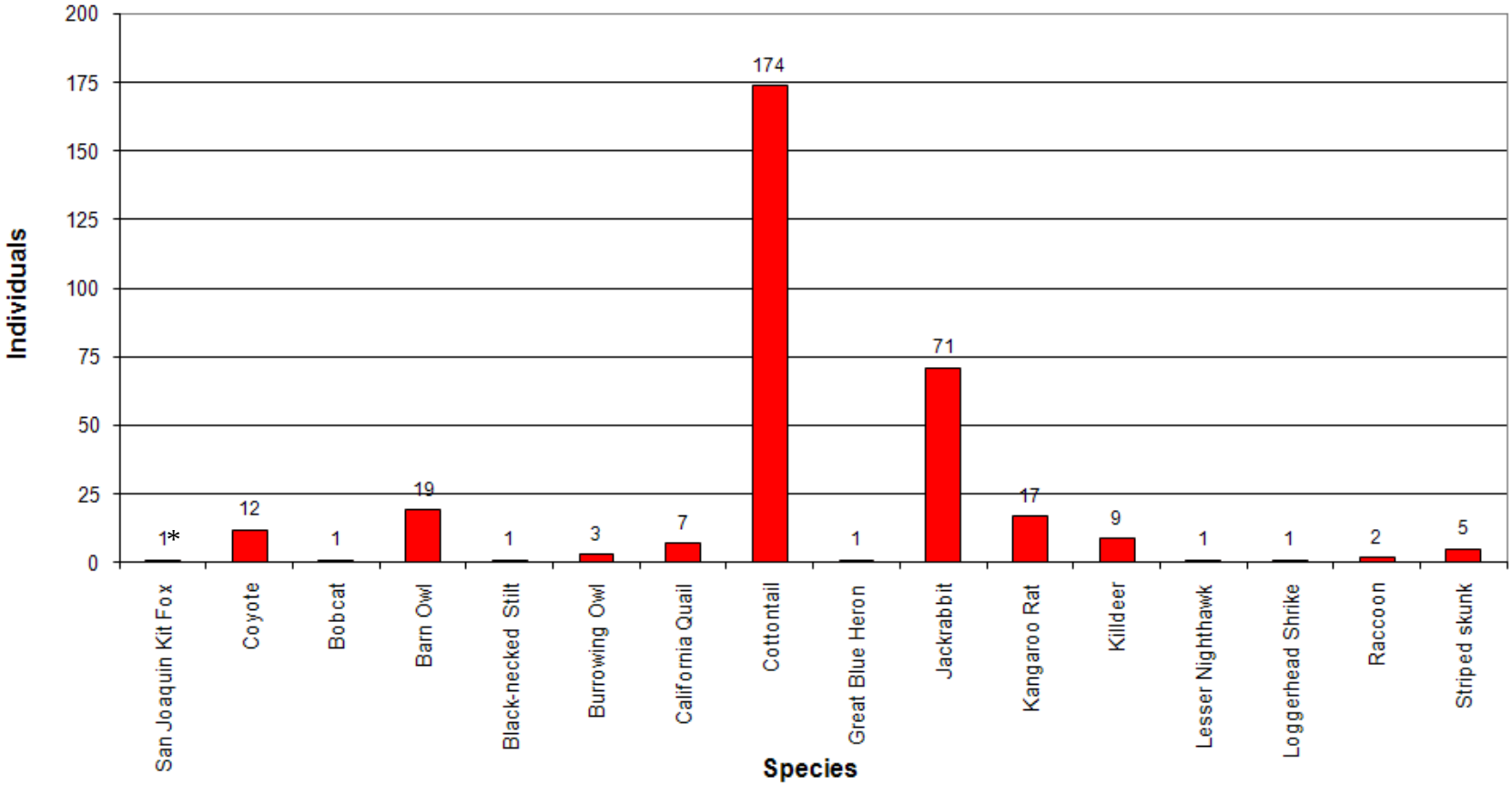

*Positive identification could not be made; however, based upon size, movement, and coloration, it is highly likely that this animal was a San Joaquin kit fox.

Figure 2. Nighttime spotlighting survey results 2009

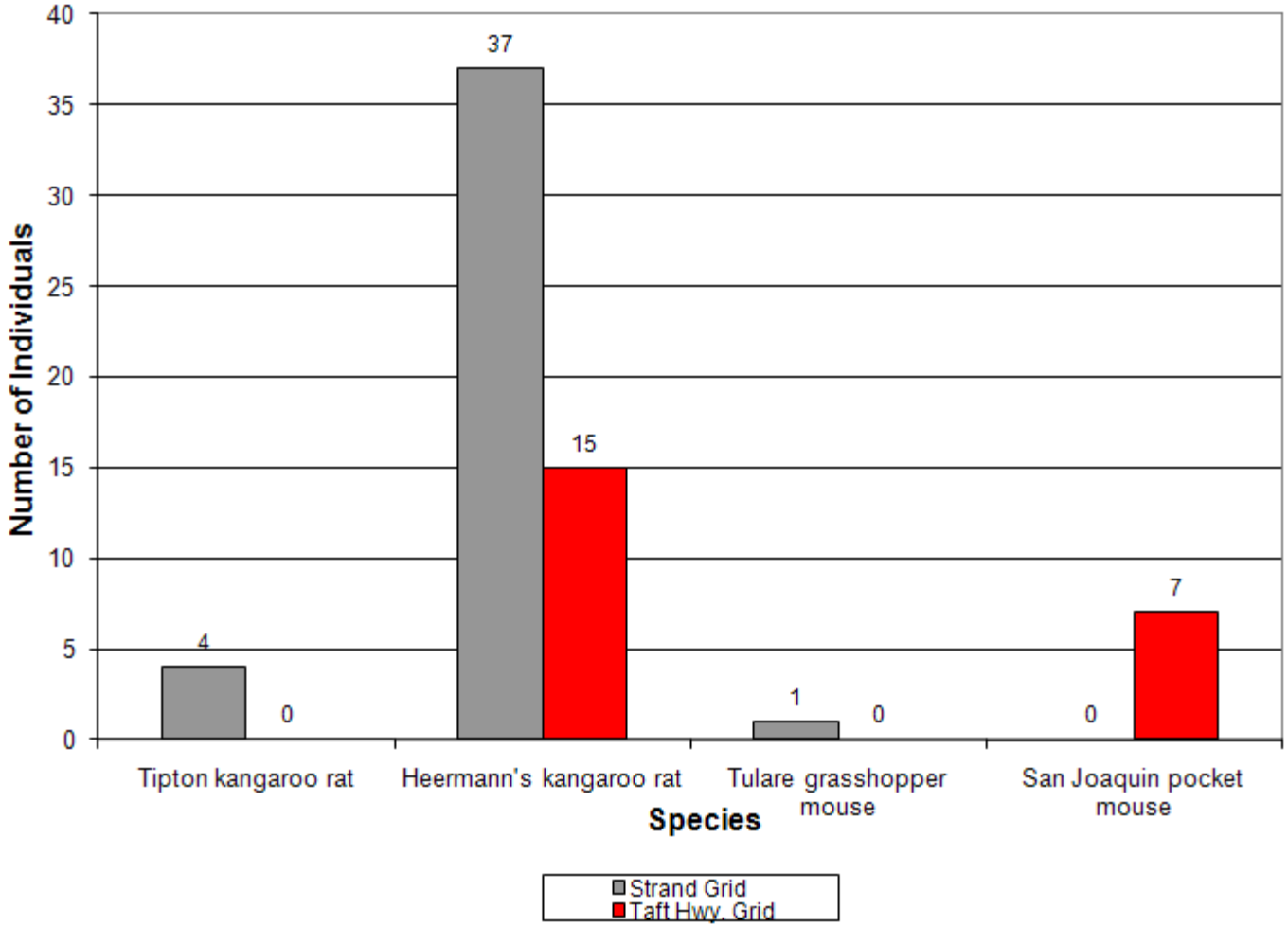

Figure 3. Tipton kangaroo rat monitoring results 2009