

## Appendix E

### 2015 Annual Wildlife Monitoring Report for the Kern Water Bank



Killdeer (*Charadrius vociferous*)

# 2015 ANNUAL WILDLIFE MONITORING REPORT for the KERN WATER BANK



**SUBMITTED TO:**

KERN WATER BANK AUTHORITY

**PREPARED BY:**

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2015 ANNUAL WILDLIFE MONITORING REPORT  
for the  
KERN WATER BANK

Submitted to:

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## 1. INTRODUCTION

This report documents the results of the 2015 annual wildlife monitoring activities conducted at the Kern Water Bank (KWB). On behalf of the Kern Water Bank Authority (KWBA), biologists from South Valley Biology Consulting LLC (SVB) conducted all monitoring activities.

As identified on Page IV-6 the KWB Habitat Conservation Plan/Natural Community Conservation Plan (KWBA 1997), hereinafter referred to as HCP/NCCP, 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, its predators and competitors, such as coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and bobcat (*Lynx rufus*), as well as several 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. SAN JOAQUIN KIT FOX MONITORING

### 2.1 Introduction

San Joaquin kit fox monitoring at the KWB in 2015 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 are useful in supplying insights into the densities of not only kit foxes, but also their predator and competitor species that occur within the KWB boundary. The main predator/competitor species for the San Joaquin kit fox on the KWB are coyotes and bobcats. American badger (*Taxidea taxus*) also occurs on the KWB and is observed in small numbers, primarily within the recharge areas.



Coyote observed during nighttime spotlighting survey

## 2.2 Methodology

Prior to conducting the nighttime spotlighting surveys, all of the lesser-travelled areas of the established nighttime spotlighting route were driven by the biologists during daylight hours. This was primarily done in the interest of safety, however, the daylight surveys also allow for identifying areas where the most suitable habitats for San Joaquin kit fox are located and for identifying potential den locations that would be worthwhile to target during the nighttime spotlighting surveys. Although the KWB is a very dynamic place and can vary dramatically from year to year, there has been no need to significantly alter the established spotlighting route for several seasons. Figure 1 provides an illustration of the 2015 survey route.

Nighttime spotlighting surveys were conducted for six nights during the evening hours. Surveys commenced at or immediately after dusk and most surveys generally took from 3 to 3.5 hours to complete. Survey dates included July 16<sup>th</sup>, 17<sup>th</sup>, 22<sup>nd</sup>, 23<sup>rd</sup>, 27<sup>th</sup>, and 28<sup>th</sup>. Because the established survey route is just over 50 miles in length, it was divided into two portions totaling approximately 25 miles each (Figure 1). The East Route consisted of all portions lying east of Enos Lane (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 the 2015 survey effort.

Each survey was conducted by two biologists traveling in a vehicle at approximately 5-10 miles per hour. The biologists each used a 3-million candlepower hand-held spotlight to observe eye-shines and individual animals. A third biologist was responsible for recording the observations onto the data sheet at specified intervals throughout the survey session and to aid in safely navigating the survey route. Double counting of observations was avoided by maintaining a constant communication while surveying and determining pre-defined areas of observation for each biologist. Observations of all identified animals, paying particular attention to kit fox and their predator and prey 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, bobcat, and American badger, were recorded onto a field map at the time of the survey and then entered into the database after the survey was completed.

## 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 adult San Joaquin kit fox observed on July 17<sup>th</sup> in the West Area in the northeast  $\frac{1}{4}$  of Section 6, west of Interstate 5 (Figure 1).

A total of 8 coyotes were observed during the surveys on six different occasions. All of the observed coyotes were adults. Four of the observations consisted of a single individual, while two adults were observed together on the other two occasions (Figure 1).

Bobcats were observed on two separate occasions during the 2015 nighttime spotlighting surveys. Both observations were of a single adult individual in relatively close proximity to the Kern Water Bank Canal (Figure 1).

Other mammalian species observations made during the 2014 nighttime spotlighting surveys included: 1 Unknown species of bat, 27 desert cottontail (*Sylvilagus auduboni*), 38 black-tailed jackrabbit (*Lepus californicus*), 4 deer mice (*Peromyscus maniculatus*), and 28 kangaroo rat (*Dipodomys* ssp.).

Avian species that were observed included a total of 14 barn owl (*Tyto alba*), 3 great horned owl (*Bubo virginianus*), 2 burrowing owl (*Athene cunicularia*), 6 killdeer (*Charadrius vociferus*), and 2 lesser nighthawk (*Chordeiles acutipennis*), and 2 red-tailed hawk (*Buteo jamaicensis*).

## 2.4 Discussion

The 2015 season marked the fourth consecutive below normal precipitation year. Although 2015 was wetter than 2014, precipitation for the 2015 season was still only about 87% of the long term average for the Bakersfield area. Most of the kit fox predator/competitor species saw a decrease in the number of observations in 2015. However, a couple of the prey species (cottontails and kangaroo rats) were observed in higher numbers in 2015 over what was observed in 2014 during the nighttime spotlighting surveys (SVB 2015). Both natural precipitation and recharge activities contribute significantly to the overall health of the KWB ecosystem by allowing for adequate growth of vegetation. An adequate seed production provides an opportunity for increased numbers of prey (i.e, kangaroo rats, mice, rabbits). Increased available prey ultimately allows for potential increases in San Joaquin kit fox and other predators.

It is encouraging that San Joaquin kit fox was again observed during the nighttime spotlighting surveys in 2015. Additionally, this is the first observation of a kit fox in the West Area that has been reported during the spotlighting surveys. Most prior observations have been made in either the conservation bank lands or in the old Strand Oilfields. Kit fox have not been observed denning on the KWB, but this species obviously forages on the KWB.

Two bobcat observations were made in both 2014 and 2015. Bobcats are typically only observed on a few occasions during the spotlighting surveys. This is partly due to the difficulty of spotting this elusive animal and their affinity for staying close to dense cover while stalking prey.

Although no American badger observations were made in 2015 during the nighttime spotlighting surveys, badgers were observed at two of the camera stations that were set in October of 2015 as a part of a pilot camera monitoring program discussed below.

Barn owl observations have been on the decline for the past few seasons, likely in response to the lower prey base availability. However, 14 observations were made in 2015, representing a significant increase from 2014 where only two observations were made. Barn owls are chief predators of kangaroo rats and mice and their numbers in the KWB area seem to be highly dependent upon the availability of these prey species. Barn owls have shown to be very capable of rapid increases in their numbers when prey is abundant.

The pilot camera station program that was initiated in late 2013 and continued into 2014 was expanded in 2015. In 2015 SVB placed a total of 10 cameras in several areas spread throughout the KWB. Two of the camera stations were rendered inoperable due to cattle. Figure 1 shows the locations of the 8 camera stations that remained operable for the duration of the effort. Cameras were put in place for 14 consecutive nights from October 2<sup>nd</sup> through October 15<sup>th</sup>. Although no kit fox were photographed, numerous other animals were photographed at several of the camera stations. The most common competitor/predator species photographed was the coyote. In fact, coyotes were photographed at all 8 of the camera stations. American badgers were photographed at two of the camera stations. Other mammalian species photographed included raccoon, black-tailed jackrabbit, desert cottontail, kangaroo rat, and deer mouse. Several bird species were photographed with many of the birds being photographed at one of the camera stations that was placed just outside of one of the water guzzler locations that the KWBA maintains for native wildlife to utilize. Some of these birds included greater roadrunner, white-crowned sparrow, killdeer, California quail, and mourning dove.



*Individual coyote visitation at camera station.*



*Two coyotes at camera station.*



*American badger at camera station.*



*Greater roadrunner at camera station.*



### 3. TIPTON KANGAROO RAT MONITORING

#### 3.1 Introduction



*Tipton kangaroo rat.*

Tipton kangaroo rat monitoring at the KWB is required annually at two permanently established trapping grids in accordance with the HCP/NCCP. The Strand Grid is located in the northwest  $\frac{1}{4}$  of Section 7, Township 30 South, Range 26 East and the Southeast Area Grid is located in the northwest  $\frac{1}{4}$  of Section 33, Township 30 South, Range 26 East.

#### 3.2 Methodology

The Strand Grid and the Southeast Area Grid are both 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 each grid in 2015 consisted of four successive nights of trapping. Trapping was conducted at the Southeast Area Grid on August 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>; and the Strand Grid was trapped on September 29<sup>th</sup>, 30<sup>th</sup>, October 1<sup>st</sup>, and 2<sup>nd</sup>. This technique yielded a total of 1,152 trap nights.

A Sherman live trap was placed at each trap location. Each trap was baited using a millet-based seed mix. A wadded paper towel was also included in each trap in order 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. 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 data sheet. After all data were collected and recorded, the animal was temporarily marked ventrally with a non-toxic ink marker and then immediately released. In order to further minimize subsequent handling times, males were marked with a blue marker and females were marked with red. Additionally, an individual was weighed only once and no re-weighing of recaptured animals was conducted.



*Sherman live trap with wadded paper towel for insulation.*

Deer mice (*Peromyscus maniculatus*) were not handled in the same manner as all of the other species. When a deer mouse was captured, no data on sex, weight, or any other parameter was collected. Therefore, the number of deer mice reported here includes recaptures. This was a safety consideration in order to minimize potential exposure to Hantavirus.

### 3.3 Results

Results from the 2015 Tipton kangaroo rat monitoring are summarized in Figure 3.

No Tipton kangaroo rats were captured at the Strand Grid in 2015. Other animals trapped at the Strand Grid were as follows: 45 Heermann's kangaroo rat (*Dipodomys heermanni*), 7 San Joaquin pocket mice (*Perognathus inornatus*), and 61 deer mice.

The trapping effort at the Southeast Area Grid yielded a total of 11 San Joaquin pocket mice, and 8 deer mice. There were no kangaroo rats trapped at this grid in 2015.

### 3.4 Discussion

The cause for the lack of any captures of Tipton kangaroo rat individuals at either of the established trapping grids is uncertain. The past few seasons of successive low rainfall undoubtedly played a major role, as Tipton kangaroo rat numbers (as well as other species of small mammals) have been declining during the current drought stretch. Also, although the KWB grids clearly have populations of Tipton kangaroo rats present, these populations do not appear to be large in size, given that only a few to several animals are trapped even in favorable years. The population of Tipton kangaroo rats in 2015 was probably very low. However, it is expected that improving habitat conditions, resulting from increased rainfall and more seed production thus far in 2016, will increase populations.

The large increase in the number of Heermann's kangaroo rats trapped in 2015 at the Strand Grid is also a bit perplexing. There was only one individual trapped in 2014 at this grid. Heermann's kangaroo rats are often favored over Tipton kangaroo rats where dense stands of allscale (*Atriplex polycarpa*) are found. There has been a systematic increase in the density of allscale shrubs on approximately the western two-thirds of the Strand Grid over the past several years. Many new shrubs and large increases in size of existing shrubs have occurred such that much of this grid is barely accessible by the biologists. This may help explain this increase in Heermann's kangaroo rat numbers at this grid.

The San Joaquin pocket mouse is an uncommon small mammal species that is trapped on occasion at both the Strand and Southeast Area Grids. However, in 2015 the 11 individuals trapped at the Southeast Area Grid was the most of any species captured, including deer mice. Likewise, the 7 individuals trapped at the Strand Grid is the most we have recorded at the Strand Grid. It is not clear why the pocket mouse population was higher in 2015, but this is something that has been observed in other areas where this species is monitored such as the neighboring Coles Levee Ecosystem Preserve (CLEP). A total of 94 San Joaquin pocket mice were trapped at Coles in 2015. That represents an increase of 840% over the 10 individuals that were trapped in 2014 (SVB 2016).

#### 4. SENSITIVE HABITAT BOTANICAL MONITORING

Five special-status plant species have historically been reported to occur at the KWB. These are: Hoover's woolly-star (*Eriastrum hooveri*), San Joaquin woollythreads (*Monolopia congdonii*), recurved larkspur (*Delphinium recurvatum*), Horn's milk-vetch (*Astragalus hornii* var. *hornii*), and slough thistle (*Cirsium crassicaule*). However, the USFWS now considers Kern mallow (*Eremalche kernensis*) to include the purple or pink-flowered populations where the populations include pistillate-flowered plants (*E. parryi* ssp. *kernensis*). This is a significant change from the policy that had been in place for many years that only considered the white-flowered populations to be "true Kern mallow". The change in designation is based upon the results of the 5-year review for the species that was published in August of 2013 (USFWS 2013). As a result of this designation, the range of the protected Kern mallow includes many additional areas, including portions of the KWB where the pink or purple-flowered plants occur. Because Kern mallow is listed as a federal endangered species and plants meeting this revised definition of Kern mallow (i.e., populations of pink or purple-flowered plants with pistillate plants present) are known to occur on the KWB, this species is now also targeted for surveys in favorable years of rainfall when this species is identifiable.

The 2014 - 2015 rain year (October 1, 2014 - September 30, 2015) in the Bakersfield area, received approximately 5.33 inches of precipitation. This represents approximately 87% of the long-term normal of 6.12 inches. Although it was still below normal, it was more than double the 2.42 inches received during the 2013 – 2014 rain year. This resulted in much more healthy and vigorous growth of San Joaquin woollythreads and Hoover's woolly-star than what was observed in 2014.



*San Joaquin woollythreads in rosette stage of growth on Jan. 19, 2015.*

SVB commenced monitoring of San Joaquin woollythreads populations at KWB in 2015 on January 19<sup>th</sup>. Approximately 100 – 150 plants were in the rosette stage of growth, probably only a couple of weeks old. All plants appeared healthy and actively growing, with many plants measuring 5 inches or more in diameter. Regular visits continued throughout the flowering period for San Joaquin woollythreads.

On February 5<sup>th</sup>, plants were growing taller and more vigorously, and by February 11<sup>th</sup>, many plants were flowering. By March 17, most plants were in the latter stages of bloom and were drying rapidly.



*San Joaquin woollythreads growing vigorously on February 5, 2015.*



*San Joaquin woollythreads in full bloom on February 11, 2015.*



*San Joaquin woollythreads rapidly drying on March 17, 2015.*



*Dense "carpet of Hoover's woolly-star at KWB on February 11, 2015.*

Several site visits were also made to known populations of Hoover's woolly-star on the KWB in 2015. Overall, 2015 was a pretty favorable year for this species as well. Plants were plentiful at all sites, with some areas densely "carpeted" with numerous plants.

As indicated above, due to the change in policy from the USFWS in regards to Kern mallow, efforts were placed on identifying populations of this species on the KWB in 2015. Several locations in the River Area were found to support this species, and it is likely that there will be many more locations identified in the future, as there is considerable habitat for Kern mallow on the KWB. SVB will conduct focused surveys throughout areas that support habitat for Kern mallow in 2016. All observed locations will be mapped using GPS and included in the 2016 annual report.



*Pistillate Kern mallow plant in River Area at KWB on March 28, 2015.*

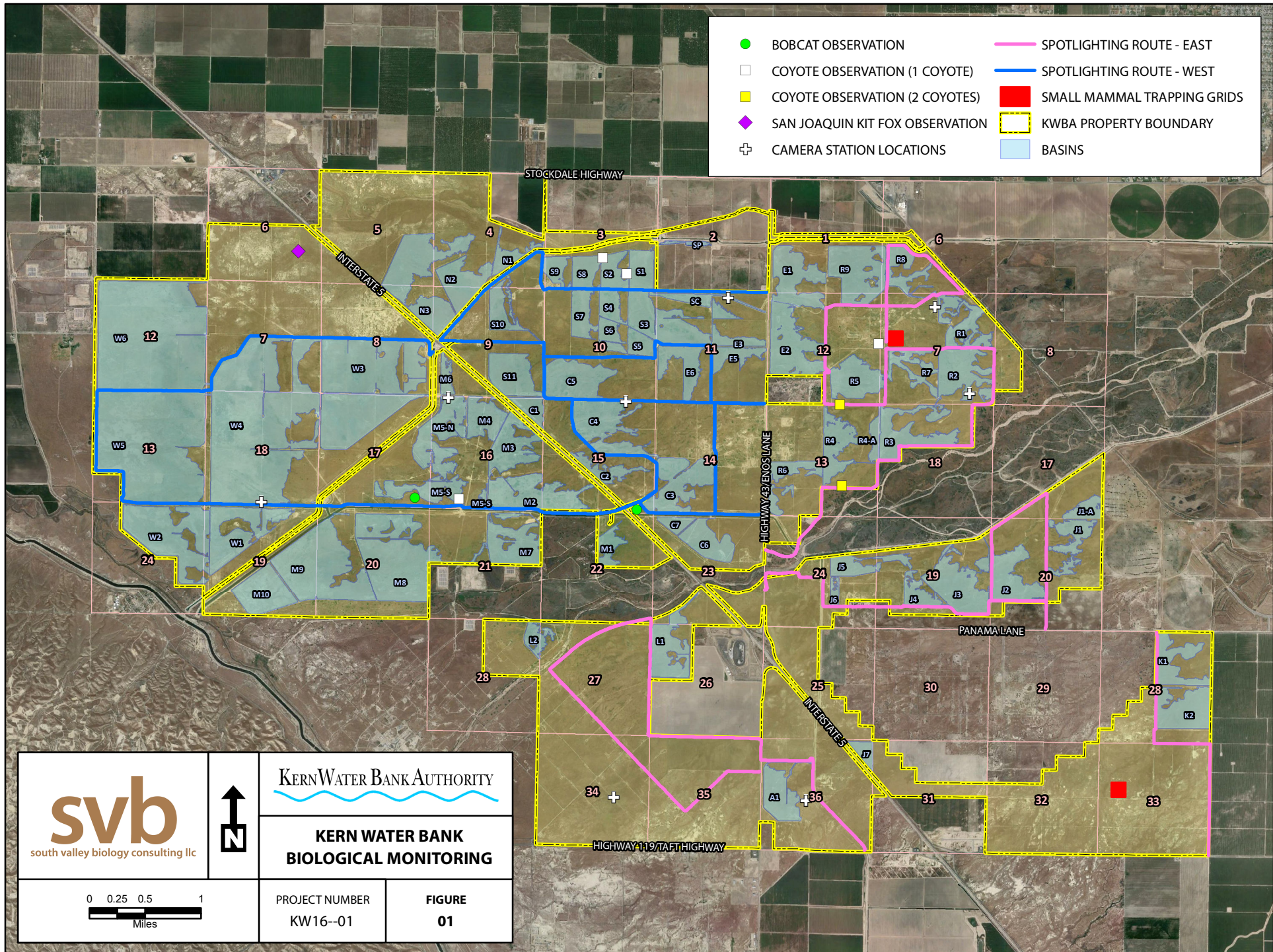


*Recurved larkspur in full bloom at KWB on March 19, 2015.*

Recurved larkspur at the KWB conservation bank lands was relatively vigorous in 2015, although only about 25 – 30 plants were identified. This species is known from the conservation bank area on both sides of the Alejandro Canal, west of Interstate 5 and east of Enos Lane (Highway 41). In more favorable years, several hundred to perhaps a few thousand individuals can be seen.

## REFERENCES

- Kern Water Bank Authority. 1997. Habitat conservation plan/natural community conservation plan. Prepared by Kern Water Bank Authority. October 2, 1997.
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- United States Fish and Wildlife Service. 2013. *Eremalche kernensis* (Kern mallow) 5-year review: Summary and evaluation. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, CA. August 2013.



- BOBCAT OBSERVATION
- COYOTE OBSERVATION (1 COYOTE)
- COYOTE OBSERVATION (2 COYOTES)
- ◆ SAN JOAQUIN KIT FOX OBSERVATION
- + CAMERA STATION LOCATIONS
- SPOTLIGHTING ROUTE - EAST
- SPOTLIGHTING ROUTE - WEST
- SMALL MAMMAL TRAPPING GRIDS
- KWBA PROPERTY BOUNDARY
- BASINS

|                               |                                    |                                                                                                                                                     |  |
|-------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                               |                                    | <p><b>KERN WATER BANK AUTHORITY</b></p> <hr style="border: 0; border-top: 1px wavy blue;"/> <p><b>KERN WATER BANK<br/>BIOLOGICAL MONITORING</b></p> |  |
|                               | <p>PROJECT NUMBER<br/>KW16--01</p> | <p>FIGURE<br/>01</p>                                                                                                                                |  |
| <p>0 0.25 0.5 1<br/>Miles</p> |                                    |                                                                                                                                                     |  |

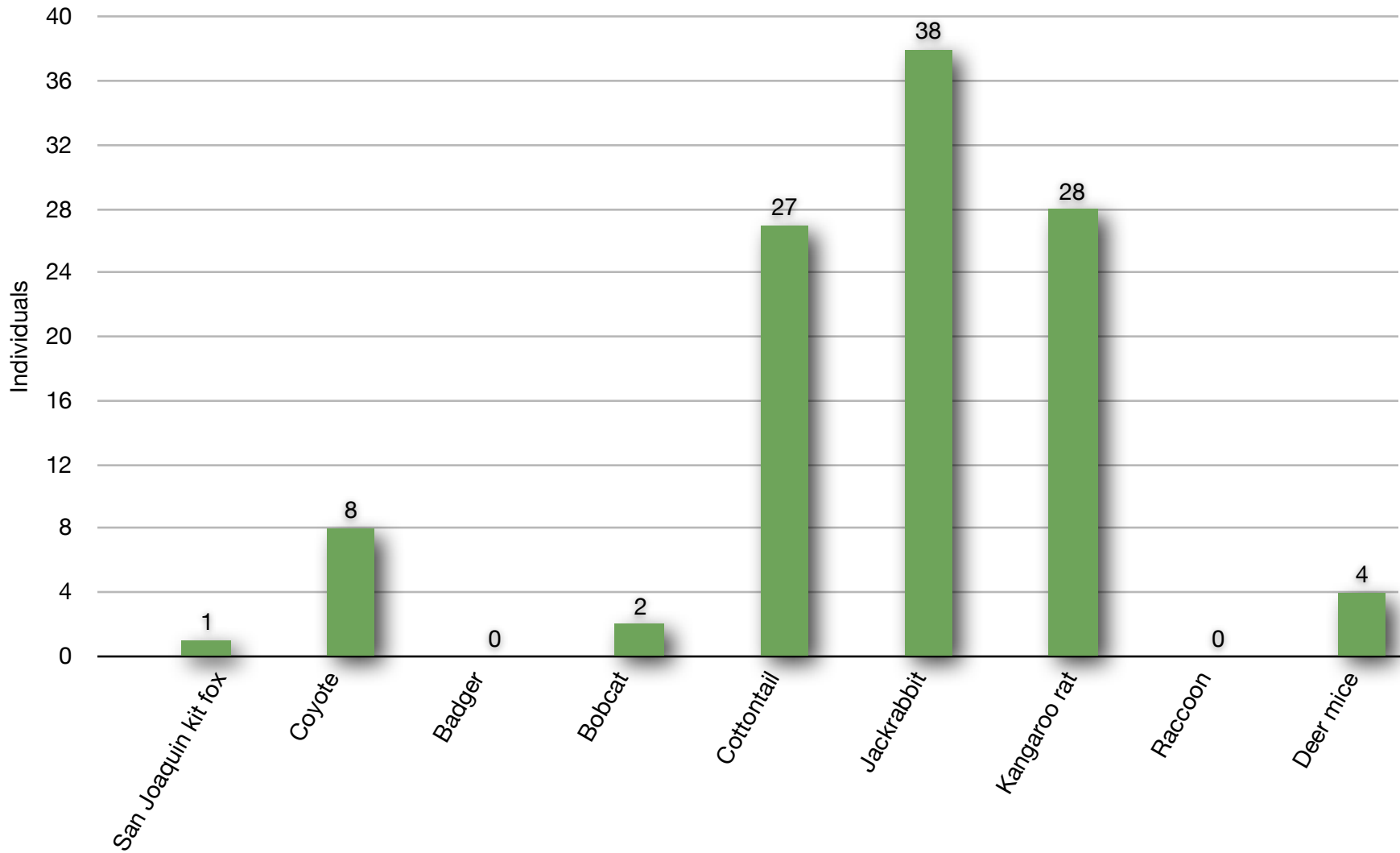


Figure 2. Nighttime spotlighting survey results 2015.

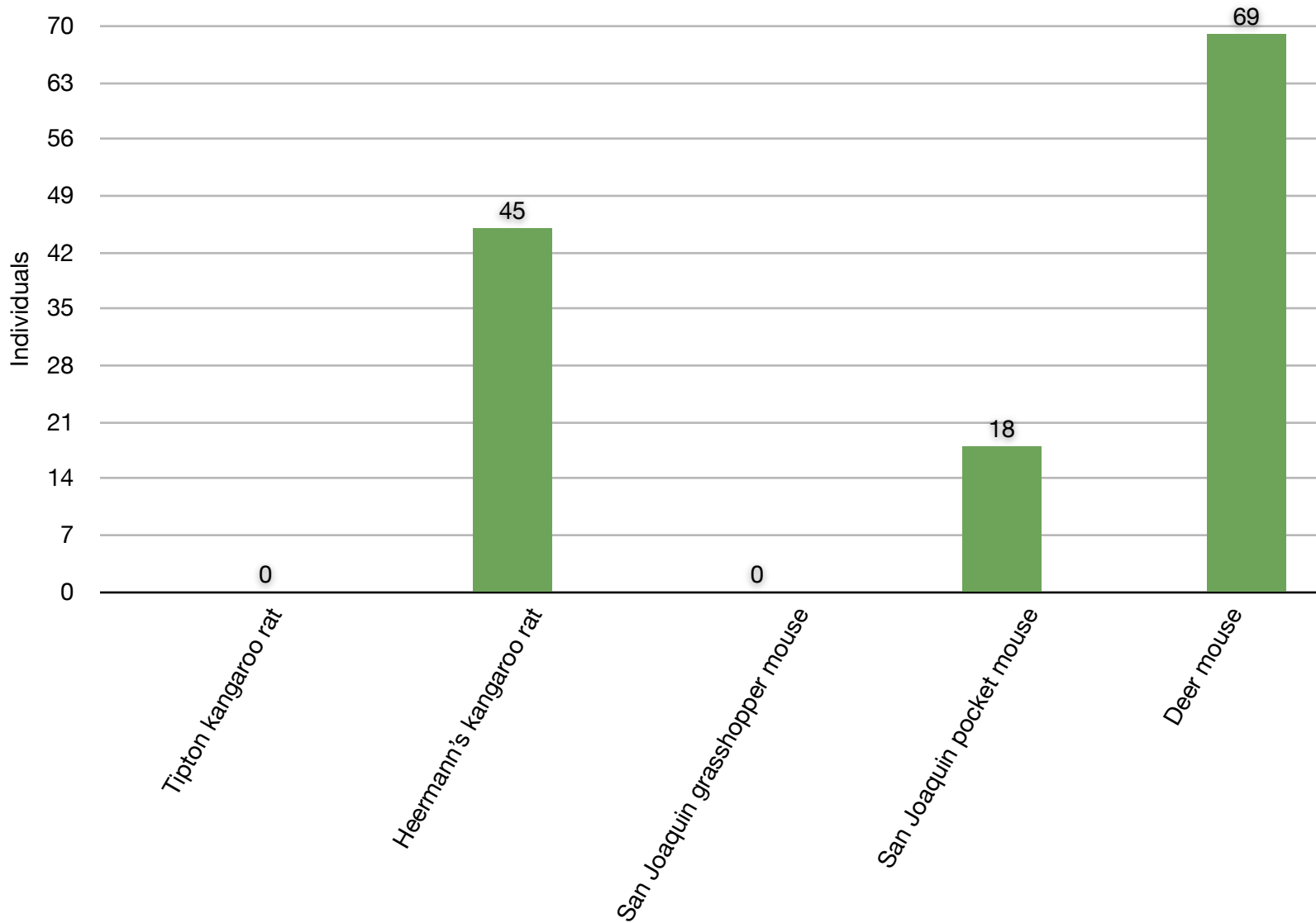


Figure 3. Tipton kangaroo rat monitoring results 2015.