

Appendix E

2014 Annual Wildlife Monitoring Report for the Kern Water Bank



Killdeer (*Charadrius vociferous*)

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2014 ANNUAL WILDLIFE MONITORING REPORT for the KERN WATER BANK



SUBMITTED TO:

KERN WATER BANK AUTHORITY

PREPARED BY:

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2014 ANNUAL WILDLIFE MONITORING REPORT
for the
KERN WATER BANK

Submitted to:

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1. INTRODUCTION

This report documents the results of the 2014 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

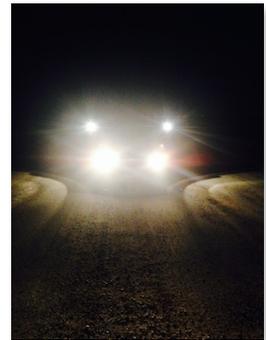
Trapping surveys on two established trapping grids to assess known population areas of Tipton kangaroo rats on the KWB.

- 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 2014 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.



Biologists conducting nighttime spotlighting surveys

2.2 Methodology

In the interest of safety, all of the lesser-travelled areas of the established nighttime spotlighting route are routinely driven and sometimes also walked by the biologists during daylight hours prior to conducting the nighttime spotlighting surveys. 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 2014 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 24th, 28th, 29th; 30th; 31st; and August 25th. 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 (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 2014 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.

The highlight of the surveys was one adult San Joaquin kit fox observed on July 30th in an area just south of the K2 Recharge Pond (Figure 1).

A total of 13 coyote observations were made during the surveys. Twelve of the observations were of adults, while one observation was of a juvenile coyote. Seven of the observations consisted of a single individual; however, one occasion two adults were observed together and on another four individuals were observed foraging together (Figure 1).

Bobcats were observed on two separate occasions during the 2014 nighttime spotlighting surveys. Both observations were of a single adult individual and both observations were in the same general area on the west side of Enos Lane (Figure 1).

A total of 3 american badger observations were made during the surveys in 2014. All observations were of a single individual in the same general location where the Cross Valley Canal, Kern Water Bank Canal, and the Main Canal come close together (Figure 1).

Other mammalian species observations made during the 2014 nighttime spotlighting surveys included: 2 Mexican free-tail bat (*Tadarida brasiliensis*), 9 desert cottontail (*Sylvilagus auduboni*), 75 black-tailed jackrabbit (*Lepus californicus*), and 5 kangaroo rat (*Dipodomys* spp.).

Avian species that were observed included a total of 2 barn owl (*Tyto alba*), 4 great horned owl (*Bubo virginianus*), 3 burrowing owl (*Athene cunicularia*), 3 northern harrier (*Circus cyaneus*), and 1 lesser nighthawk (*Chordeiles acutipennis*).

One common king snake (*Lampropeltis getula*) was also observed during the surveys.

2.4 Discussion

The 2014 season marked the third consecutive below normal precipitation year. The effects of this drought cycle appeared to affect nearly every predator and prey species at the Kern Water Bank. For example, coyote observations in 2014 were down significantly from what was reported during the 2013 spotlighting surveys (SVB 2014). This was likely due to the reduced availability of prey such as mice and kangaroo rats. The lowered prey populations undoubtedly affected not only coyotes, but many other species that depend on these prey for their survival. There was no recharge occurring in 2014, making it the third consecutive season where all of the recharge basis were again dry. This results in very few waterbirds (potential alternate prey for coyotes, kit foxes, and other mammalian predators) being present. As resilient and resourceful as coyotes can be, the dramatically lower prey numbers in 2014 were an obvious limiting factor on the coyote population.

The one San Joaquin kit fox observation in 2014 was made in the Southeast Area where no coyote observations were recorded. This is not to say that coyotes do not occur in the Southeast Area, they most certainly do occur there, however, coyotes are much more commonly observed in the West, Main, Strand, and River Areas. Kit fox

observations have been few over the years at KWB, however, foraging kit foxes are occasionally observed. Most often the observations occur on the conservation bank lands such as the South and Southeast Areas, and in the old Strand oil field lands within the River Area.

The two bobcat observations made in 2014 were both adult individuals that were seen foraging in the same general area just west of Enos Lane and north of Munzer Road. This area is part of the old Strand oil field. Although bobcats are relatively commonly seen at KWB in many areas, they are not seen in high numbers during the spotlighting surveys. This is probably due to their ability to duck into cover quickly and avoid detection.

Three American badger observations were made in 2014. As indicated above, all of the observations were made in the same general area. These observations occurred on three different nights, making it probable that we may have been seeing the same individual. Badgers are not uncommon at KWB but they are certainly not plentiful either.

Only two barn owl observations were made in 2014. That represents a significant drop from the 11 observations made in 2013. The drop in the number of observations is almost certainly a result of the continued decrease in the amount of prey (mostly kangaroo rats and mice). This is a trend that began with the start of the current drought cycle. Barn owls are chief predators of kangaroo rats and mice and barn owl numbers in the KWB area seem to be highly dependent upon the availability of these prey species.



Eye shine from 3 coyotes at camera station

The pilot camera station program that was implemented in late 2013 was continued in a pilot manner into 2014. SVB placed 2 cameras in the Southeast Area for 5 consecutive nights from August 11th through August 15th in an effort to photograph the kit fox that was observed foraging in the area during the spotlighting surveys. Unfortunately, the cameras did not capture any photographs of kit foxes. Instead, only jackrabbits, coyotes, cottontails, and ravens were photographed.

SVB has purchased additional cameras and we intend to place several cameras at the KWB in 2015.

3. TIPTON KANGAROO RAT MONITORING

3.1 Introduction



*Tipton kangaroo rat
from the Strand Grid*

Tipton kangaroo rat monitoring at the KWB is required to occur 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 2014 consisted of four successive nights of trapping. Trapping was conducted at the Southeast Area Grid on September 9th, 10th, 11th, 12th; and the Strand Grid was trapped on September 30th, October 1st, 2nd, and 3rd. 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 at
trapping grid*

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 2014 Tipton kangaroo rat monitoring are summarized in Figure 3.

Two Tipton kangaroo rats were captured at the Strand Grid in 2014. Other animals trapped at the Strand Grid were as follows: 1 Heermann's kangaroo rat (*Dipodomys heermanni*), 1 San Joaquin grasshopper mouse (*Onychomys torridus tularensis*), 1 western harvest mouse (*Reithrodontomys megalotis*) and 25 deer mice.

The trapping effort at the Southeast Area Grid yielded a total of 4 Tipton kangaroo rats , 1 San Joaquin grasshopper mouse, 2 San Joaquin pocket mice (*Perognathus inornatus*), and no deer mice.

3.4 Discussion

The two established trapping grids at the KWB have yielded consistent monitoring results for a few years now. Since the establishment of the Southeast Area Grid in 2011, we have captured Tipton kangaroo rats every year. Granted, there were fewer Tipton kangaroo rats captured at both grids than what were captured in 2013 (3 at the Strand Grid in 2013, 2 at the Strand Grid in 2014, 8 at the Southeast Area Grid in 2013, and 4 at the Southeast Area Grid in 2014). However, it is still very encouraging to continue to capture Tipton kangaroo rats at both grids given the populations of all small mammals were low due to four low rainfall seasons in succession. Of particular interest is the fact that while only 6 Tipton kangaroo rats were captured in 2014, only one Heermann's kangaroo rat was captured. Heermann's kangaroo rat populations are well known to skyrocket in favorable conditions and their numbers often plummet during unfavorable conditions and this is what has happened at the KWB. The Tipton kangaroo rats tend to have fluctuations based on habitat conditions as well, however, their numbers do not typically experience the magnitude of change that we see with the Heermann's kangaroo rats. For example, we captured a total of 77 Heermann's kangaroo rats at the KWB in 2011, then only 20 in 2012, then just 13 in 2013 until finally in 2014 we only captured a single individual. The Tipton kangaroo rat captures over the same time period went from 13 in 2011, to 12 in 2012, then to 11 in 2013, and 6 in 2014.

It is also encouraging to see that San Joaquin grasshopper mice and San Joaquin pocket mice continue to be captured, even in these dry years. Although neither of these species are listed species, they are both species of concern that the USFWS and CDFW are monitoring. The KWB supports populations of both species in the conservation lands and sensitive habitat sectors.

The 2014-2015 rains season looks like it will also end up being below normal, however, significant rain fell early in the season and this resulted in abundant primary production

which should lead to a much greater availability of seed. Therefore, we expect that there will be a good chance that the 2015 trapping sessions will likely see an increase in the number of Tipton kangaroo rats captured. It is also anticipated that the abundant seed will be exploited well by Heermann's kangaroo rats and their numbers will likely increase sharply, particularly at the Strand Grid where this species can become very abundant.

4. SENSITIVE HABITAT BOTANICAL MONITORING

Five special-status plant species have 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*).

The only listed plant species known from the KWB is the San Joaquin woollythreads, a federal endangered species. San Joaquin woollythreads is an annual species, that like many other special-status species, is known to be highly dependent upon adequate precipitation for germination and growth (USFWS 1998). The 2013 – 2014 rain year (October 1, 2013 – September 30, 2014) in the Bakersfield area, saw the lowest total precipitation (2.42 inches) since 2008 (1.77 inches). Furthermore, it marked the third consecutive below normal rain year. As a result, it did not appear that any San Joaquin woollythreads plants even germinated in 2014.



San Joaquin woollythreads main population area as seen on February 20, 2014. The pin flags mark the locations of individual plants at this site from 2013.

The San Joaquin woollythreads populations at the KWB generally germinate in January and are readily identifiable by the middle of February. SVB biologists began site visits to the four known populations of this species in late January and continued regular site visits into March. However, we did not observe any San Joaquin woollythreads plants at any of the known locations on the KWB in 2014. Likewise, no other special-status species that occur on the KWB were observed at anytime in 2014.

Obviously, three consecutive drought years have had a dramatic effect on the habitat conditions at the KWB and just about all species are negatively affected by the consistent low precipitation. However, the KWB is a very dynamic and resilient place and we fully expect the special-status plant populations to respond to favorable rainfall conditions that will eventually occur in the future.

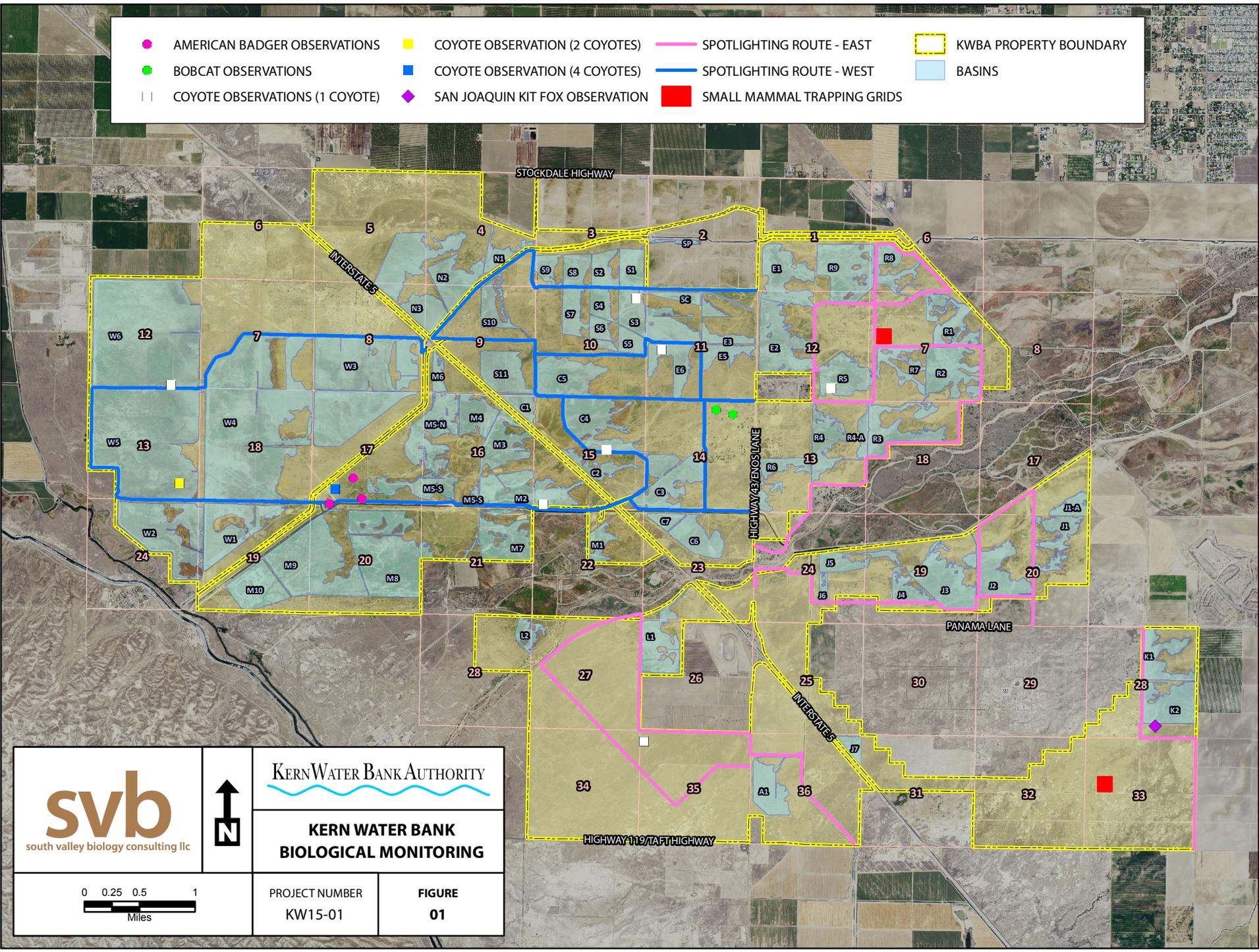
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	AMERICAN BADGER OBSERVATIONS		COYOTE OBSERVATION (2 COYOTES)		SPOTLIGHTING ROUTE - EAST		KWBA PROPERTY BOUNDARY
	BOBCAT OBSERVATIONS		COYOTE OBSERVATION (4 COYOTES)		SPOTLIGHTING ROUTE - WEST		BASINS
	COYOTE OBSERVATIONS (1 COYOTE)		SAN JOAQUIN KIT FOX OBSERVATION		SMALL MAMMAL TRAPPING GRIDS		



 south valley biology consulting llc		KERN WATER BANK AUTHORITY	
		KERN WATER BANK BIOLOGICAL MONITORING	
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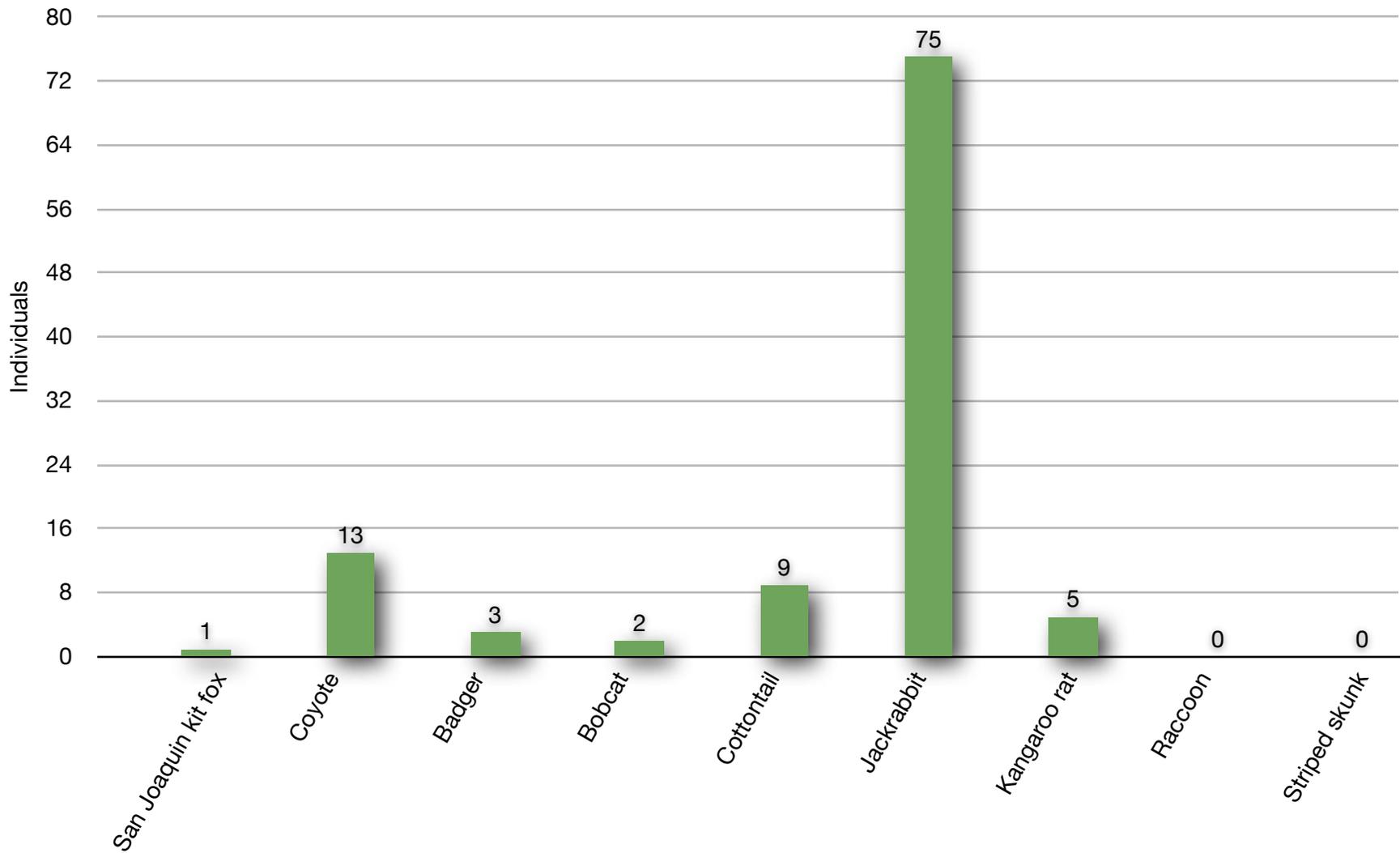


Figure 2. Nighttime spotlighting survey results 2014.

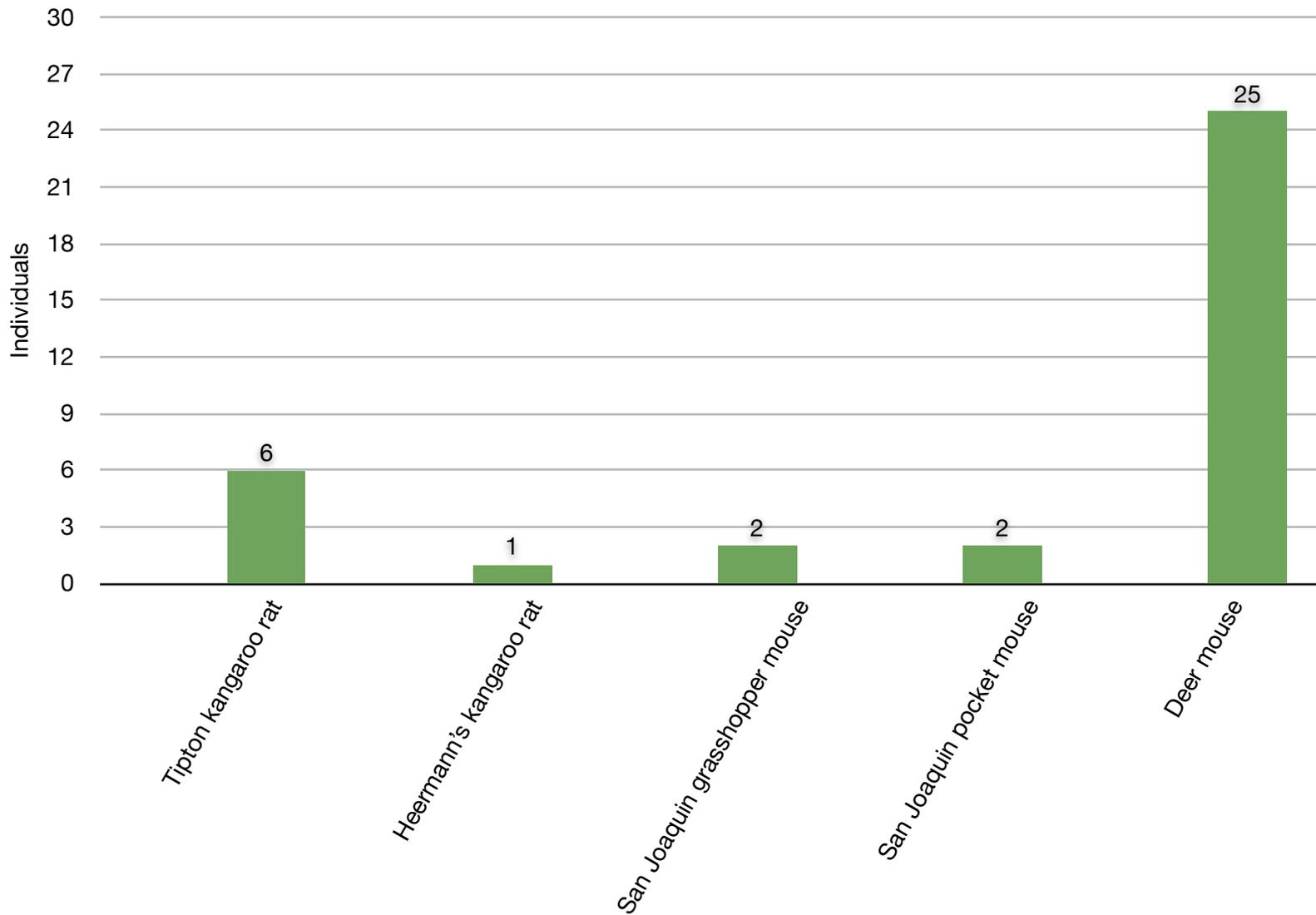


Figure 3. Tipton kangaroo rat monitoring results 2014.