2012 ANNUAL WILDLIFE MONITORING REPORT
for the
KERN WATER BANK

SUBMITTED TO:

KERN WATER BANK AUTHORITY

PREPARED BY:

svb
south valley biology consulting llc

May 30, 2013

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Submitted to:

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May 30, 2013

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1.0 INTRODUCTION

This report documents the results of the 2012 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

2.0 SAN JOAQUIN KIT FOX MONITORING

2.1 Introduction

San Joaquin kit fox monitoring at the KWB in 2012 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. Another species that has been observed on the KWB is the red fox, although no red foxes have been observed during the nighttime spotlighting surveys for several years now. American badger (*Taxidea taxus*) is also observed on the KWB from time to time.

Sunset over the Kern Water Bank Canal with the town of Tupman and the Elk Hills Oilfield in the background.

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, we have not had to significantly alter the established spotlighting route in recent years. Figure 1 provides an illustration of the 2012 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 4 hours to complete. Survey dates included November 27th, December 3rd, 4th,11th, 13th, and 19th. 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 the 2012 survey effort on the KWB.

Two biologists conducted the surveys while traveling in a vehicle at approximately 5-10 miles per hour. Each biologist used a 3-million candlepower hand-held spotlight to observe eye-shines and individual animals. Double counting of observations was avoided by both observers maintaining a constant communication while surveying and determining pre-defined areas of observation for each biologist. Observations of all identified 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, 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.

No San Joaquin kit fox observations were made during the 2012 spotlighting surveys.

A total of 22 coyote observations were made during the surveys. All of the observations were of adults. Most of the time a single individual was observed (*n =12*); however, two individuals were observed foraging together on 5 occasions (Figure 1).

Bobcats were observed on three separate occasions during the 2012 nighttime spotlighting surveys. All three observations were of a single adult individual.

Other mammalian species observations made during the 2012 nighttime spotlighting surveys included: 2 raccoon (*Procyon lotor*), 1 striped skunk (*Mephitis mephitis*), 135 desert cottontail (*Sylvilagus auduboni*), 268 black-tailed jackrabbit (*Lepus californicus*), and 21 kangaroo rat (*Dipodomys* ssp.).

Avian species that were observed included a total of 41 barn owl (*Tyto alba*), 4 great horned owl (*Bubo virginianus*), 6 killdeer (*Charadrius vociferus)*, and 1 red-tailed hawk (*Buteo jamaicensis*) observations.

2.4 Discussion

An adult great horned owl perched on a power pole adjacent to the S1 Pond.

The Kern Water Bank concluded water recharge in early 2012 and all of the recharge basins were dry by early March. When the Kern Water Bank operations switch from recharge to recovery, the landscape can change quite rapidly. Over just a matter of a few weeks, several square miles of shallow water basins turn to densely vegetated mud flats then to tall, dense, stands of herbaceous vegetation that can become almost impassable. The tall vegetation makes it difficult to see nocturnal animals and undoubtedly, animals go uncounted. In order to help minimize this effect, the spotlighting surveys are typically conducted late in the year after a recharge cycle to allow cattle sufficient time to graze the area and help open up the habitat.

In 2012, the huge numbers of waterbirds that opportunistic mammalian predators such as coyotes exploit, were no longer present. This probably contributed to the decline in coyote observations which were down from 34 in 2011, when recharge was occurring, to 22 in 2012 when the basins were empty (SVB 2012). However, this may be misleading in that when the basins are full it is often times easier to spot coyotes due to the fact that they tend to forage on and along the levee roads much more so that they probably would otherwise do if the basins were dry. Still, the abundance of prey in the form of waterbirds, especially coots, when recharge is occurring appears to be a significant food source for coyotes and it is reasonable to conclude that the absence of the waterbirds probably had a negative effect on the coyote population in 2012.

As noted above, Bobcats were observed on three occasions during the 2012 surveys. This species has often been observed with regularity in association with the larger water ways on the property (e.g., the Kern River and Kern Water Bank Canal). This is not to

say that they are not observed in other areas during other activities, but during the nighttime spotlighting surveys this species is usually observed in close proximity to these waterways. In 2012, all three observations of this species were of bobcats actively foraging within the dry recharge basins. This is likely because of the available prey (mice, kangaroo rats, and ground squirrels) that move into the basins when they are dry. As the cattle thin out the vegetation, it probably makes for good hunting conditions for the bobcats.

Barn owls are perhaps the most adept predator of kangaroo rats. A single owl can catch and eat several kangaroo rats each night. When the kangaroo rat populations are high, the barn owl population usually follows suit. In 2012, the barn owl population was down considerably from 2011. Although 41 barn owl observations were made in 2012, that was down more than 58% from the 99 observations made during the 2011 nighttime spotlighting surveys. A smaller prey base was likely the main factor, as the number of observations of kangaroo rats and mice were down significantly from 2011 (SVB 2012).

No kit foxes were observed in 2012. This species is not abundant on the KWB and is only occasionally seen during the nighttime spotlighting surveys. Because of the difficulties seeing nocturnal animals due to dense vegetation conditions, the immense size of the Kern Water Bank, and the low numbers of kit foxes, nighttime spotlighting may not be the best way to census the population. Other methods such as camera stations, scent stations, or a combination of these may prove more useful. There would be at least two important considerations in implementing these techniques.

First, the KWB experiences significant trespass and theft every year. Even well hidden camera stations would be subject to potential vandalism and theft. A high quality infrared camera can cost several hundred dollars or more, and are often very difficult to obtain.

Second, cattle grazing is an essential tool in helping to manage vegetation on the KWB. Cattle would likely be a nuisance at scent stations and camera stations, and they would probably obliterate the tracking medium at many of the scent stations. If cameras were used, they would need to be made “cattle-proof” by placing them on structures where cattle cannot reach. This would limit where and how the cameras could be placed; however, given the large number of water wells, power poles, and other similar structures that are present throughout much of the area, it seems feasible that enough locations could be identified and utilized.

Despite these problems, a well-designed camera station program could provide year-round data collection and photographic records on a multitude of species, not just the monitoring of kit fox activities.

3.0 TIPTON KANGAROO RAT MONITORING

3.1 Introduction

Tipton kangaroo rat from the Southeast Area 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 ¼ of Section 7, Township 30 South, Range 26 East, and this grid has been trapped every year since 1996. The Southeast Area Grid, located in the northwest 1/4 of Section 33, Township 30 South, Range 26 East was also trapped in 2012. This marks the second year in succession that this grid was trapped.

The Taft Highway Grid, which had been trapped annually from 1996 until 2010 was not trapped in either 2011 or 2012. As indicated in the 2010 Annual Report (SVB 2011), the Southeast Area Grid permanently replaced the Taft Highway Grid beginning in 2011.

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 2012 consisted of four successive nights of trapping. Trapping was conducted at the Southeast Area Grid on August 28th, 29th, 30th, 31st; and the Strand Grid was trapped on September 25th, 26th, 27th, and 28th. This technique yielded a total of 1,152 trap nights.

A Sherman live trap was placed at each trap location and 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.

Deer mice 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 2012 Tipton kangaroo rat monitoring are summarized in Figure 3.

Two Tipton kangaroo rats were captured at the Strand Grid in 2012. Other animals trapped at the Strand Grid were as follows: 13 individual Heermann's kangaroo rats (*Dipodomys heermanni*), 1 San Joaquin grasshopper mouse (*Onychomys torridus tularensis*), and 18 deer mice (*Peromyscus maniculatus*).

The trapping effort at the Southeast Area Grid yielded a total of 10 Tipton kangaroo rats , 7 Heermann's kangaroo rats, 2 San Joaquin grasshopper mice, 2 San Joaquin pocket mice (*Perognathus inormatus*), and 12 deer mice.

As has been done in prior years, no attempt to handle deer mice was made, all individuals were released immediately after identification. Therefore, it should be noted that the 30 total deer mice captured (18 at the Strand Grid and 12 at the Southeast Area Grid) also includes recaptures.

3.4 Discussion

The Tipton kangaroo rat population is known to be relatively small at the Strand Grid, as no more that 4 individuals have ever been trapped during any of the annual trapping sessions. The Heermann's kangaroo rat population fluctuates considerably at this grid, while the Tipton kangaroo rat population seems to be more stable. This is a pattern that has presented itself many times in the past. The livestock grazing program appears to be helping to improve the habitat conditions at the Strand Grid by opening up the invading stands of allscale (*Atriplex polycarpa*). This may favor the Tipton kangaroo rat population over the long term. Germano, et al, (2012) found that an invasion of saltbush during a long term grazing study conducted in the Lokern area of Kern County appeared to favor the Heermann's kangaroo rat over the short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*). If cattle can continue to help open the area and reduce the allscale density at the Strand Grid, the Tipton kangaroo rat population could grow larger. The effect may be two-fold. Tennant & Germano (2013) found that the larger Heermann's kangaroo rat probably competitively suppresses the smaller Tipton kangaroo rat where they coexist. Therefore, a reduction in conditions that favor the Heermann's kangaroo rat also would tend to reduce competitive pressure on the Tipton kangaroo rat.

The habitat conditions at the Southeast Area Grid are almost ideal for Tipton kangaroo rats. Very widely spaced shrubs, a mosaic of open alkali scalds, and absence of dense grasses almost certainly provide a competitive advantage to the Tipton kangaroo rat. The 10 Tipton kangaroo rats versus the 7 Heermann's kangaroo rats captured in 2012 support this idea. It is our opinion that very little, if any, vegetation maintenance would

ever be required at the Southeast Area Grid. The other portions of the Southeast Area that support similar vegetation also likely have good numbers of Tipton kangaroo rats. Any additional investigative work on the distribution of kangaroo rats on the KWB should consider the high quality habitat portions of the Southeast Area and perhaps include a grazing regime that targets adjacent areas that tend to become densely vegetated with non-native grasses.

There is no doubt that the Kern Water Bank Conservation Lands provide several areas of occupied Tipton kangaroo rat habitat. These areas are key in helping to protect and maintain this species both locally and cumulatively on a much larger scale. As identified in USFWS (1998), one key element of the recovery strategy for the Tipton kangaroo rat is to protect large blocks of habitat for the species. The KWB should be considered an important component of this recovery strategy.

4.0 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*). Slough thistle has not been reported on the KWB for several years, and Horn's milk-vetch has recently started to appear in some of the recharge basins, ditches, and other water conveyances on the KWB.

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 is known to be highly dependent upon adequate precipitation for germination and growth (USFWS 1998). For the 2011 – 2012 rain year (October 1, 2011 – September 30, 2012) in the Bakersfield area, the total precipitation was only 4.95 inches (approximately 76% of the long-term average of 6.49 inches). In addition to the low rainfall, the timing at which it rained, coupled with cold temperatures during a significant portion of the winter months had a dramatic negative effect on San Joaquin woollythreads. Despite repeated site visits during the winter and early spring to all three of the known occurrences of this species at the KWB, no plants were ever observed. It is likely that no plants ever germinated. Alternatively, if any plants did germinate, they probably were killed by the many frosty nights of dry cold.

San Joaquin woollythreads location on March 5, 2012. The cold, dry winter was unfavorable for this species.

In 2011, the rainfall was abundant, but the timing at which it fell was not beneficial to San Joaquin woollythreads. Abundant early precipitation led to high germination of this species, however, the non-native European annuals were able to take advantage and quickly crowd out the San Joaquin woollythreads plants (SVB 2012). Therefore, both 2011 and 2012 were

unfavorable years for this species. If conditions are more suitable for this species in 2013, additional surveys to identify new occurrences will be conducted.

Regarding the other special-status plant species at the KWB in 2012, only one was observed, and that was Horn's milk-vetch. This species has been showing up in several of the recharge basins and canals at the Kern Water Bank for the past few years. The recharge cycle in 2011 that concluded in early 2012 led to favorable conditions for this species. As a result, this species was observed at many locations during the summer and autumn 2012. However, because there will probably not be any recharge conducted in 2013, it is expected that little or no germination of this species will be observed.

Horn's milk-vetch in one of the recharge basins in early summer 2012.

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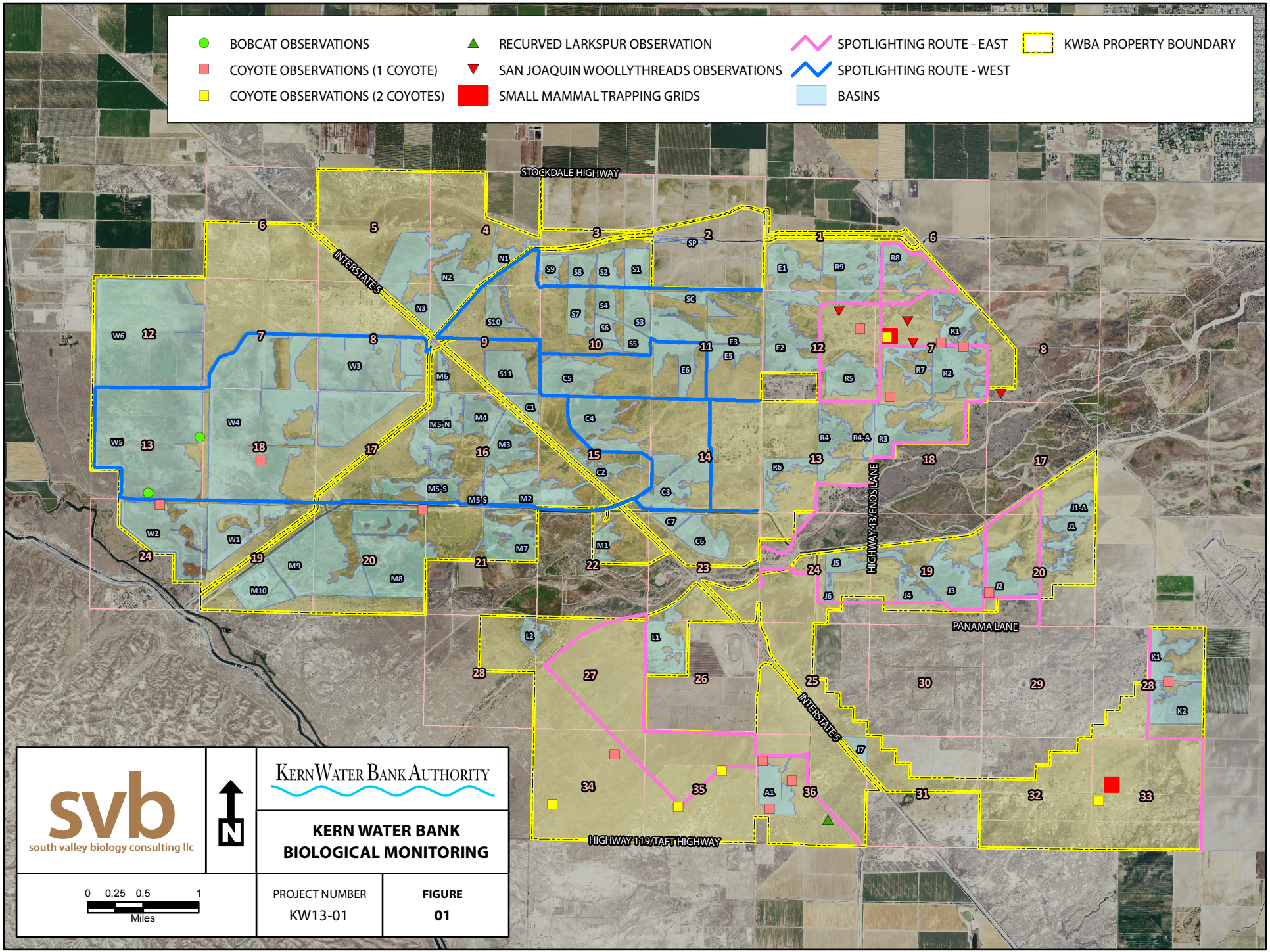
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COYOTE OBSERVATIONS (1 COYOTE)
COYOTE OBSERVATIONS (2 COYOTES)
RECURVED LARKSPUR OBSERVATION
SAN JOAQUIN WOOLLYTHREADS OBSERVATIONS
SMALL MAMMAL TRAPPING GRIDS
SPOTLIGHTING ROUTE - EAST
SPOTLIGHTING ROUTE - WEST
BASINS
KWBA PROPERTY BOUNDARY
STOCKDALE HIGHWAY
INTERSTATE 5
HIGHWAY 43/ENOS LANE
PANAMA LANE
HIGHWAY 119/TAFT HIGHWAY
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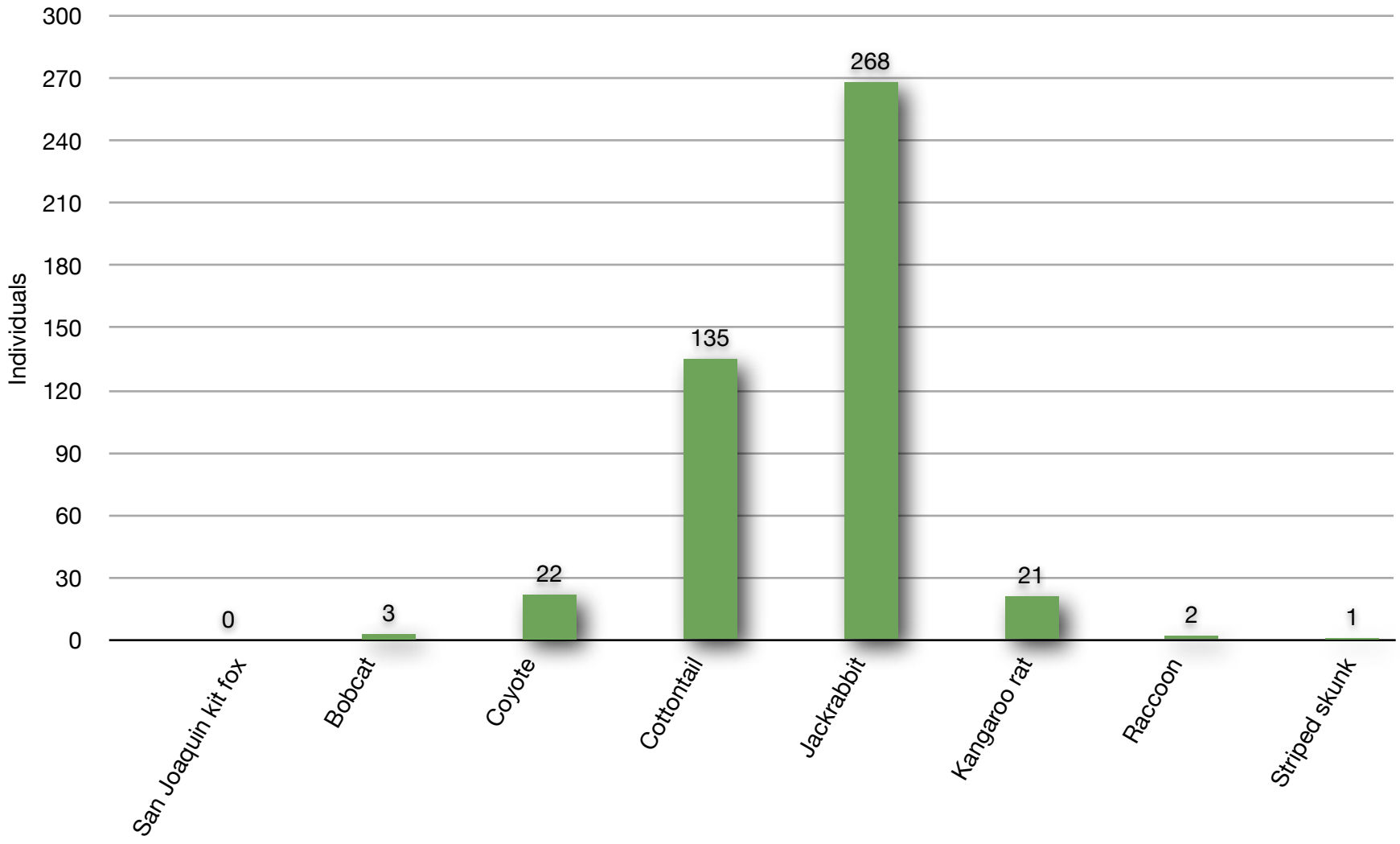

Figure 2. Nighttime spotlighting survey results 2012.

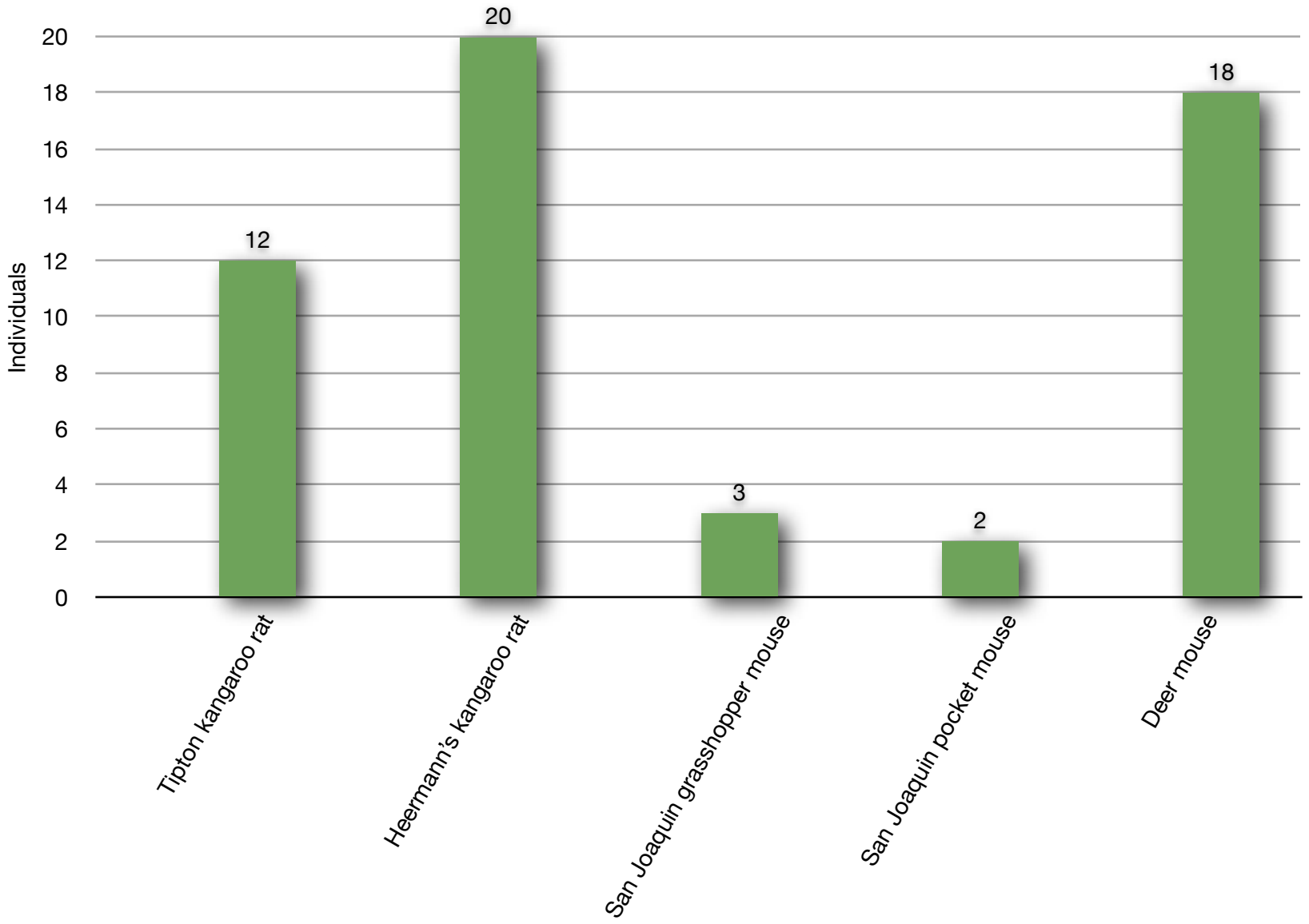

Figure 3. Tipton kangaroo rat monitoring results 2012.