Appendix E

2013 Annual Wildlife Monitoring Report for the Kern Water Bank

Killdeer (*Charadrius vociferous*)

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2013 ANNUAL WILDLIFE MONITORING REPORT
for the
KERN WATER BANK

SUBMITTED TO:

KERN WATER BANK AUTHORITY

PREPARED BY:

svb
south valley biology consulting llc

May 25, 2014

2013 ANNUAL WILDLIFE MONITORING REPORT
for the
KERN WATER BANK

Submitted to:

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1.0 INTRODUCTION

This report documents the results of the 2013 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 2013 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, mostly in the recharge areas.

Black-tailed jackrabbits are commonly observed at KWB during spotlight 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 2013 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 November 13th, 14th, 19th; and December 11th, 13th, and 16th. 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 2013 survey effort.

Three biologists conducted the surveys while traveling in a vehicle at approximately 5-10 miles per hour. Two biologists each used a 3-million candlepower hand-held spotlight to observe eye-shines and individual animals. The 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 the observers 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 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 2013 spotlighting surveys.

A total of 34 coyote observations were made during the surveys. All of the observations were of adults. Most observations consisted of a single individual (*n = 13*); however, on several other occasions (*n = 8*), two to four individuals were observed foraging together (Figure 1).

Bobcats were observed on two separate occasions during the 2013 nighttime spotlighting surveys. Both observations were of a single adult individual.

Other mammalian species observations made during the 2013 nighttime spotlighting surveys included: 2 American badger, 1 raccoon (*Procyon lotor*), 1 striped skunk (*Mephitis mephitis*), 50 desert cottontail (*Sylvilagus audubonii*), 115 black-tailed jackrabbit (*Lepus californicus*), and 11 kangaroo rat (*Dipodomys* ssp.). Five observations were made of canids that could not be positively identified to species; however, it is believed that these were most likely observations of coyotes, due to their large size and coyotes are so abundant at KWB.

Avian species that were observed included a total of 11 barn owl (*Tyto alba*), 1 great horned owl (*Bubo virginianus*), 5 burrowing owl (*Athene cunicularia)*, and 1 red-tailed hawk (*Buteo jamaicensis*) observations.

2.4 Discussion

The very dense stands of vegetation that were present on the KWB in 2012 were not present in 2013. Cattle grazing and mowing in the recharge areas were effective at reducing the amount of rank vegetation that develops during and after a recharge cycle. The opening of the habitat makes it much easier to spotlight animals and helps reduce the potential for missing animals hidden by the tall plants. It was reported in 2012 that coyote numbers may have declined due to the absence of large numbers of waterbirds that were present in 2011 while the KWB was experiencing a recharge cycle (SVB 2013). In 2011, coyotes were observed on many occasions actively hunting waterbirds, especially American coots (*Fulica americana*). The virtual absence of these birds in 2012 undoubtedly affected the coyotes and other predators. However, 34 coyote observations were made during the 2013 spotlight surveys. That was 12 more observations than the 22 coyote observations made in 2012. We believe there are two contributing factors for the increase. First, and perhaps most important, the opening of the vegetation made observations of all animals easier to make. Second, coyotes are very adaptive and can exploit almost any food source. The opening of the vegetation may have resulted in other prey species being more readily available and easier to capture.

The two bobcat observations made in 2013 were of adult individuals foraging in two of the recharge basins. The bobcat population at the KWB does not appear to fluctuate significantly from year to year. Generally, only a few observations are made during the spotlighting surveys each season. Bobcats are typically rather shy and tend to run to cover very quickly when spotted. This behavior makes the species more difficult to detect.

Barn owl observations continued on the decline in 2013, where just 11 observations were made. This is much lower than the 99 observations in 2011 and 41 observations reported in 2012 (SVB 2013). Barn owls are chief predators of kangaroo rats and mice and barn owl numbers in the KWB area seem to be very dependent upon these prey species. Kangaroo rat observations made during the spotlighting surveys were down by nearly 50% from what was observed in 2012. Likewise, the number of Heermann's kangaroo rats trapped during the 2013 trapping effort at KWB were down significantly from 2012.

No kit foxes were observed in 2013. There were 5 unidentified canids observed; however, as noted above, all of the canids were likely too large to be kit foxes. San Joaquin kit foxes have not been documented denning on the KWB; however, individual kit foxes are sometimes observed foraging in the conservation lands and in some of the sensitive habitat sectors at the KWB. These are areas that should probably be considered as having the highest potential for kit foxes.

A pilot camera station program was implemented in late 2013 in an effort to assess the feasibility and success of perhaps supplementing traditional nighttime spotlighting surveys with camera stations. A total of 5 cameras were placed in areas where kit foxes and their predator/competitor species have been observed in the past, and in areas where cattle were currently grazing to evaluate whether their presence would be problematic. SVB has conducted camera station surveys in other areas where cattle were present and it is common for cattle to be curious about the cameras and can damage them if the cameras are not placed high enough off the ground or in some other fashion that is out of their reach. Therefore, in areas where no cattle were present, cameras were mounted approximately 3 feet from the ground on 3/4-inch thick steel posts. this is the preferred method. The one camera located where cattle were grazing was mounted on an existing power pole approximately 6 feet off the ground. A can of cat food was perforated and securely fastened to the ground at each camera station in order to attract nearby foraging predators to the sites. The cameras were left in place for 7 days and nights from December 2 through December 8, 2013.

Coyote at camera station.

Coyotes were consistently observed at 4 of the 5 stations on several of the nights. Other species observed were black-tailed jackrabbit, California ground squirrel (*Otospermophilus beecheyi*), kangaroo rat (*Dipodomys* sp.), common raven (*Corvus corax*), and killdeer (*Charadrius vociferus*). Cattle were also observed regularly.

Despite the lack of kit fox observations during this pilot program, SVB believes that camera stations provide an important tool in evaluating and documenting kit fox presence at the KWB, as well as their predators/competitors.

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 the Southeast Area Grid is located in the northwest 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 2013 consisted of four successive nights of trapping. Trapping was conducted at the Southeast Area Grid on August 20th, 21st, 22nd, 23rd; and the Strand Grid was trapped on October 8th, 9th, 9th, and 11th. 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.

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 2013 Tipton kangaroo rat monitoring are summarized in Figure 3.

Three Tipton kangaroo rats were captured at the Strand Grid in 2013. Other animals trapped at the Strand Grid were as follows: 10 individual Heermann's kangaroo rats (*Dipodomys heermanni*), and 31 deer mice.

The trapping effort at the Southeast Area Grid yielded a total of 8 Tipton kangaroo rats , 3 Heermann's kangaroo rats, 2 San Joaquin grasshopper mice (*Onychomys torridus tularensis*) , 11 San Joaquin pocket mice (*Perognathus inormatus*), and no 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 (all at the Strand Grid) also includes recaptures.

3.4 Discussion

The Tipton kangaroo rat population is known to be small and seemingly relatively stable at the Strand Grid, as no more that 4 individuals have ever been trapped during any of the annual trapping sessions. Therefore, the 3 individuals trapped in 2013 is encouraging. Low precipitation in 2013 and managed livestock grazing both contributed to an open understory at this grid which tends to favor this species. However, the 2013 - 2014 rain year was the third consecutive below normal precipitation year. Although Tipton kangaroo rats prefer areas with sparse herbaceous cover and cannot survive in areas where there is a thick buildup of thatch (USFWS 1998), too many dry years in succession can result in scarcity of seed, and populations of many small mammals including Tipton kangaroo rat can be severely depleted or even disappear altogether. It will be necessary to reduce or postpone grazing in the vicinity of this grid if precipitation does not increase in 2014.

Although the 8 Tipton kangaroo rats captured at the Southeast Area Grid in 2013 was 20% lower than the 10 trapped in 2012, other areas such as the nearby Coles Levee Ecosystem Preserve also saw a decrease (28%) in the numbers of Tipton kangaroo rats captured during 2013 (SVB 2014). The Southeast Area Grid is located in some of the best habitat on the KWB for Tipton kangaroo rats. The area immediately to the south of this grid continues to be of interest for Tipton kangaroo rats. SVB believes this area holds a high potential for Tipton kangaroo rat presence and could probably be enhanced through managed grazing to increase that potential. The area is old agricultural farm land that has regenerated to non-native grassland with scattered patches of goldenbush (*Isocoma acradenia*) and allscale (*Atriplex polycarpa*) shrubs. It is unknown if the area currently supports Tipton kangaroo rats, but much of the area has been prone to a large buildup of thatch in prior above normal rainfall years.

Lastly, it is worthy to note that while only 2 San Joaquin pocket mice were captured in 2012, 11 individuals were captured in 2013. It is unclear why this species was much more abundant on the KWB in 2013. Conversely, the San Joaquin pocket mice captures were down by 22% at Coles Levee in 2013 (SVB 2014). The San Joaquin pocket mouse is on the list of Special Animals maintained by the California Dept. of Fish and Wildlife (CDFW). It is a species for which the CDFW is interested in tracking, regardless of their legal status (CDFG 2011).

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*).

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). For the 2012 – 2013 rain year (October 1, 2012 – September 30, 2013) in the Bakersfield area, the total precipitation was only 3.13 inches (approximately 48% of the long-term average of 6.49 inches). SVB reported in 2012 that no San Joaquin woollythreads were observed at any of the three known population occurrences at the KWB (SVB 2013). Furthermore, it was believed that the low rainfall coupled with many frosty nights were the likely causes.

In 2013, not only was San Joaquin woollythreads observed, but SVB located a new population occurrence of 28 plants. This new occurrence is located approximately 0.2 mile southeast of the original Thomas Tank Setting population. Additionally, there were over 500 plants observed at the Thomas Tank Setting original known population. These observations were made on February 20 and 25, 2013 and all plants were notably small in stature, most measured less than 2.5 inches tall. By March 1, 2013 most plants had made it to bloom many of the smaller plants were drying out rapidly. By March 13, all plants were fruiting or were senesced. By March 26 all plants had senesced, disintegrated, and were no longer visible. The following sequence of photographs is provided to help illustrate the progression of development of San Joaquin woolly-threads at KWB in 2013.

San Joaquin woollythreads in vegetative growth on February 5, 2013.

San Joaquin woollythreads flowering on February 20, 2013.

San Joaquin woollythreads on February 28, 2013. Most plants were drying rapidly.

San Joaquin woollythreads on March 13. Almost all plants had completed the season and were senesced.

It is very curious to note the difference in observations made in 2013 versus the 2012 observations. This is especially true given the similar amount of precipitation that had occurred during the early portion of the rain season in both years. At KWB, San Joaquin woollythreads germinates in December or January, with plants beginning to flower in late January into mid to late February. By the middle of March, the plants have typically senesced and no trace of the plants can be found. Therefore, any rain that falls after March 1 is probably not a significant factor for this species. In 2012 the amount of precipitation that had occurred by the end of February was 2.04 inches. In 2013, the precipitation totaled 2.20 inches; only 0.16 inch more. Therefore, there must have been other factors that were more important. One very important factor would have been the number of frost days in December and January when plants were germinating and growing. No data was collected at KWB on the number of frost days, but December 2011 and January 2012 were noticeably colder with more frost days and nights than what was experienced in December 2012 and January 2013. SVB believes that the more frosty nights, especially in December 2012, coupled with no measurable rainfall during that month were the most important factors for no plants being observed in 2012. December 2012 and January 2013 were warmer, while at the same time measurable rain fell in each of those important months. SVB believes this resulted in few plants succumbing to frost kill and most plants that germinated were able to grow into some level of maturity.

SVB made several visits during the blooming period to known locations of other special-status plant species on the KWB, but only a few occurrences of Hoover's woolly-star and Horn's milk-vetch were seen.

Hoover's woolly-star plants varied from very small to about 5.5 inches tall. Five known locations were visited in 2013 during the months of March and April. All locations had at least a few individuals, with the largest location having several hundred plants.

Hoover's woolly-star on March 13, 2013.

Horn's milk-vetch on March 11, 2013. Only 3 plants were seen and none appeared to live long enough to produce flowers.

Only a few individual Horn's milk-vetch plants were located. These were in a depression within the River Area that appeared to be an old borrow pit from many years ago. This site was visited on March 11, 2013 and three plants were observed. All plants were young and small in stature. This site was re-visited on May 28, 2013; however, all plants were senesced in a vegetative state with no visible sign of flowers having been produced. It is believed there was not an adequate amount of moisture in the soil to sustain the plants to the flowering stage.

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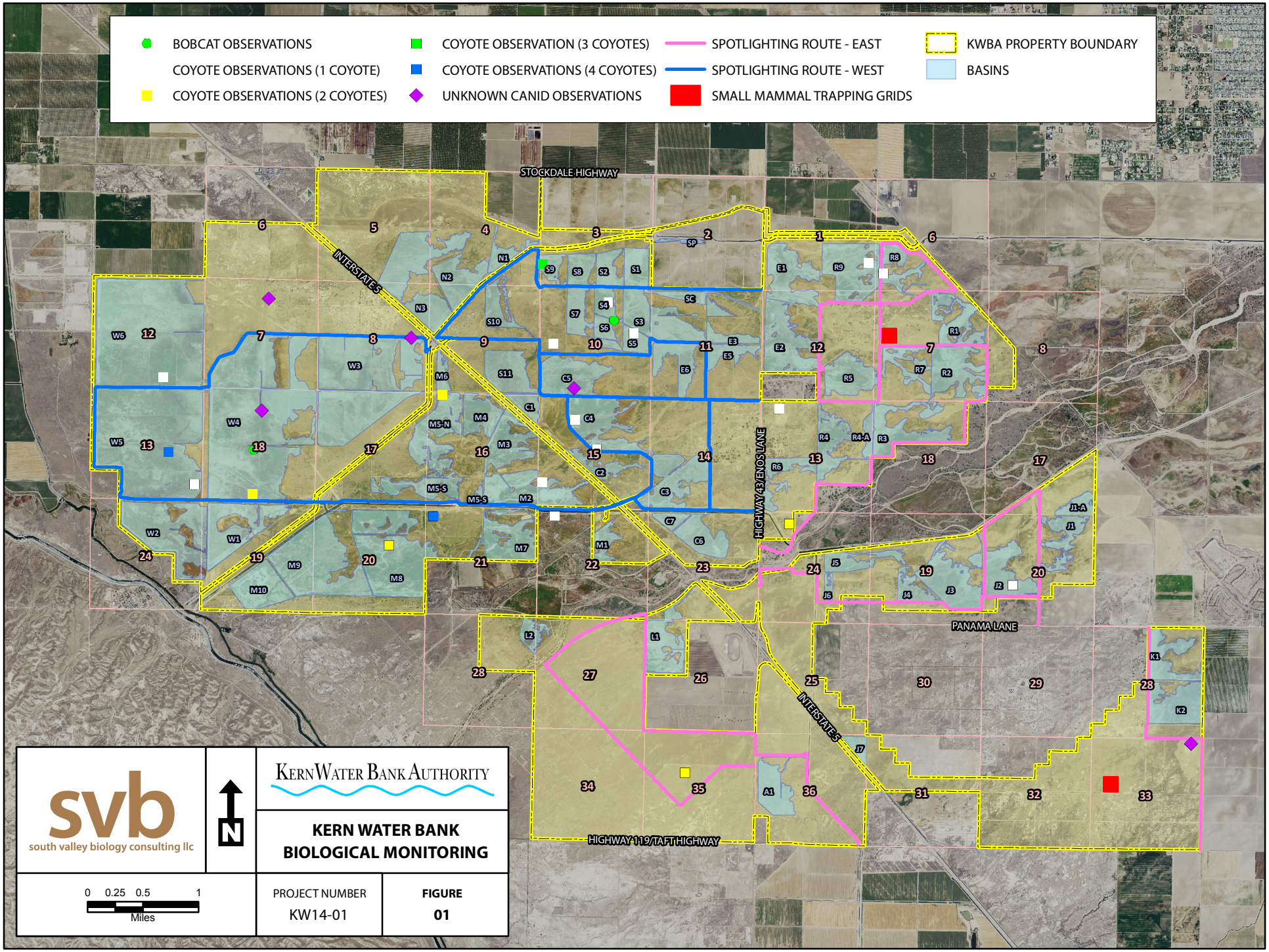
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UNKNOWN CANID OBSERVATIONS
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SPOTLIGHTING ROUTE - WEST
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KWBA PROPERTY BOUNDARY
BASINS
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INTERSTATE 5
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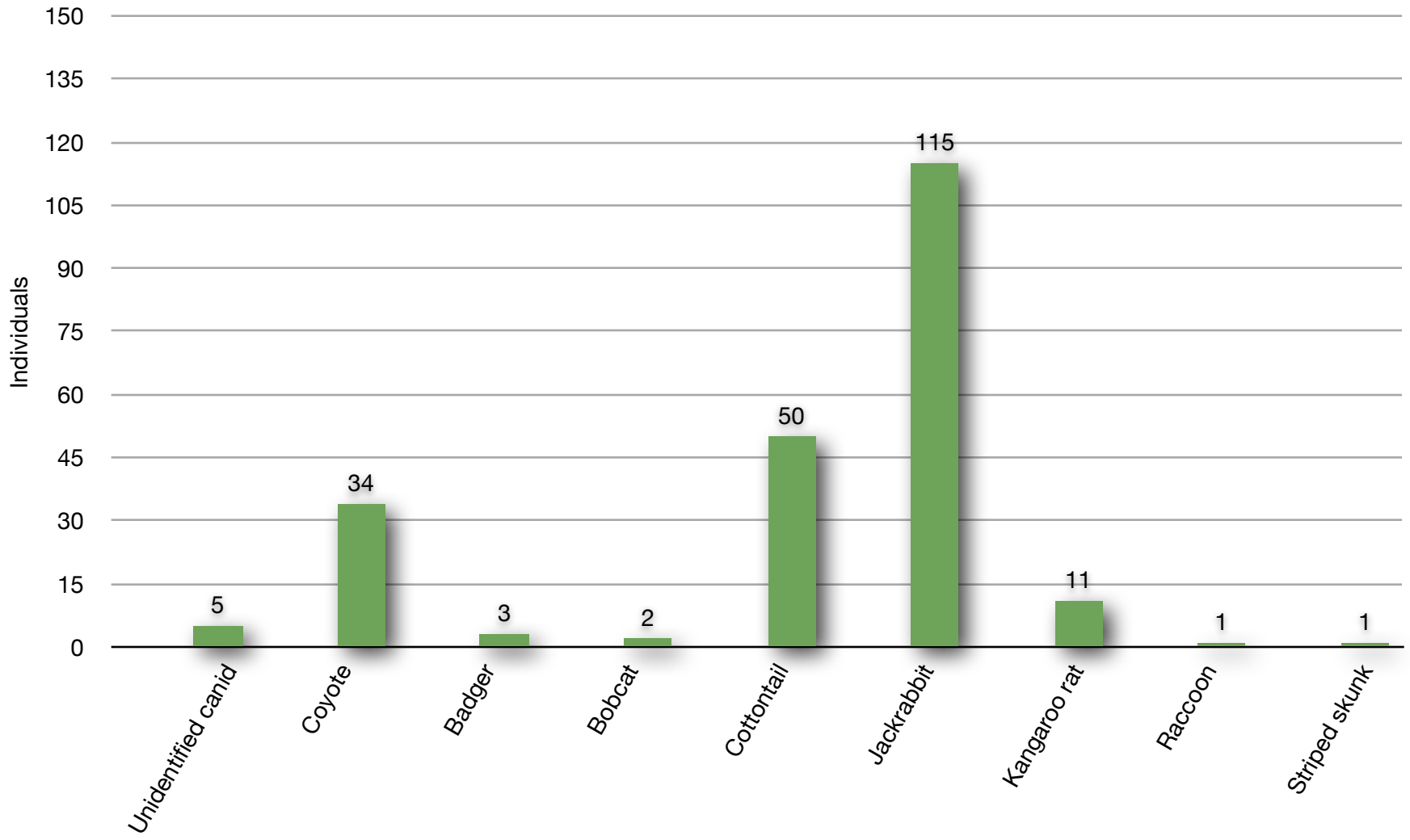

Figure 2. Nighttime spotlighting survey results 2013.

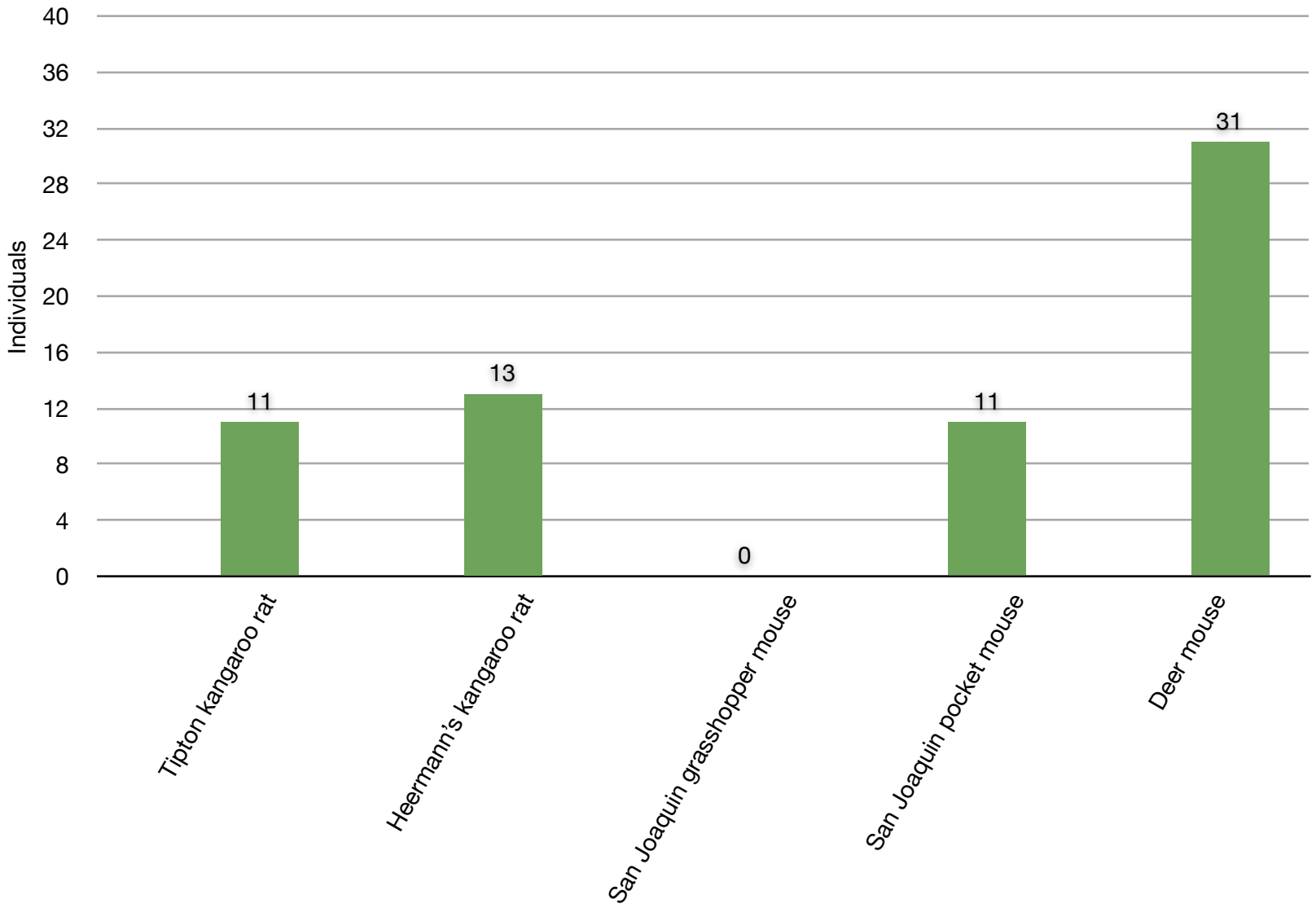

Figure 3. Tipton kangaroo rat monitoring results 2013.