

Appendix D

2011 Annual Wildlife Monitoring Report for the Kern Water Bank



Killdeer (*Charadrius vociferous*)

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2011 ANNUAL WILDLIFE MONITORING REPORT for the KERN WATER BANK



SUBMITTED TO:

KERN WATER BANK AUTHORITY

PREPARED BY:

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2011 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 2011 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

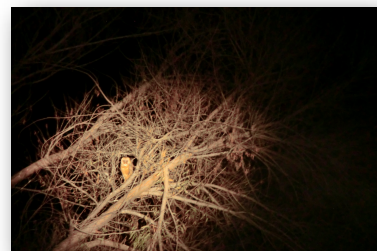
Trapping surveys on two established trapping grids to assess known population areas of Tipton kangaroo rats on the KWB.

- 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 2011 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 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.



2.2 Methodology

Primarily for safety reason, all of the lesser-travelled areas of the established nighttime spotlighting route are driven and sometimes also walked by the biologists during daylight hours prior to conducting the nighttime spotlighting surveys. This approach was utilized in 2011. 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. No significant alterations to the established spotlighting route were required in 2011. Figure 1 provides an illustration of the 2011 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 1st, 2nd, and 3rd, and December 26th, 28th, 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 2011.

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 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 at the conclusion of the survey (typically the next day).

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 2011 spotlighting surveys.

A total of 34 coyote observations were made during the surveys. 31 of the observations were of adults, and 3 observations were of juveniles or young adults. Fifteen observations consisted of a single individual, with the remaining 19 observations consisting of from 2 to 4 individuals in a single group (Figure 1).

No bobcat observations were made during the 2011 nighttime spotlighting surveys.

Other mammalian species observations made during the 2011 nighttime spotlighting surveys included: 409 desert cottontail (*Sylvilagus auduboni*), 296 black-tailed jackrabbit (*Lepus californicus*), and 237 kangaroo rat (*Dipodomys* spp.) observations.

A total of 99 barn owl (*Tyto alba*), 2 great horned owl (*Bubo virginianus*), and 16 burrowing owl (*Athene cunicularia*) observations were made throughout the KWB during the 2011 nighttime spotlighting surveys. Several other bird species including American coot (*Fulica americana*), American white pelican (*Pelecanus erythrorhynchos*), black-crowned night heron (*Nycticorax nycticorax*), California quail (*Callipepla californica*), great egret (*Casmerodius albus*), killdeer (*Charadrius vociferus*), great blue heron (*Ardea herodias*), loggerhead shrike (*Lanius ludovicianus*), lesser nighthawk (*Chordeiles acutipennis*), mallard (*Anas platyrhynchos*), and white-faced ibis (*Plegadis chihi*) were also observed during the surveys.

2.4 Discussion

Perhaps the most important factor that may have contributed to changes in observations from the 2010 surveys, was that almost all of the recharge ponds were at or near capacity for almost the entire 2011 season. The abundance of water resulted in an increased number of observations of several species of birds utilizing the ponds. However, observations of the kit fox competitor, predator, and prey species that are not dependent on the ponds (e.g., coyotes, bobcats, kangaroo rats, cottontail, etc.) were down from what was observed in 2010 (South Valley Biology 2011). When the ponds are dry, many of the basins and banks are used by these species but when the ponds are flooded they are not available for travel by upland predators such as coyotes and bobcats. This is not to say that the ponds do not provide potential prey for these predators. On the contrary, coyotes were observed on several occasions preying upon birds that use the ponds. Coyotes are very resourceful and able to exploit a wide variety of available prey species; therefore, it is not surprising that the number of coyote observations during the 2011 nighttime spotlighting surveys (although down by about 26% from 2010) are still among the highest that have been reported.

Kit foxes are not commonly observed on the KWB, but they are observed occasionally. Usually these observations are made within the compatible habitat and conservation bank lands on the KWB. Often, kit fox observations are made during other monitoring activities. It is not clear why kit foxes are in such low number at KWB, but we have noted many times that the high population of coyotes is undoubtedly an important factor.

It is worth noting that although no observations of bobcats were made during the 2011 nighttime spotlighting surveys, bobcats were observed on several other occasions by SVB during other monitoring activities. Bobcats are certainly not abundant on KWB, but this species is often seen in certain localized areas with dense cover and shrubs (e.g., along portions of the Kern River).

Of particular interest is the large number of barn owl observations in 2011. This species is an exceptional predator on kangaroo rats and mice. The kangaroo rat and mice populations are still very high on the KWB and it is almost certainly the primary reason the barn owl population was high in 2011.

3.0 TIPTON KANGAROO RAT MONITORING

3.1 Introduction



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 this grid has been trapped every year since 1996. It was also trapped again by SVB biologists in 2011. As reported in the 2010 Annual Wildlife Monitoring Report (South Valley Biology 2011), the Taft Highway Grid that was located in the northeast $\frac{1}{4}$ of Section 36, Township 30 South, Range 25 East, was abandoned in 2010 due to no Tipton kangaroo rats having been trapped at that grid for many years. Instead, an investigative trapping effort was pursued in lieu of trapping the Taft Highway Grid in 2010. The investigative trapping effort resulted in a new grid being established in the northwest $\frac{1}{4}$ of Section 33, Township 30 South, Range 26 East. This new grid, dubbed the Southeast Area Grid, was trapped in 2011 and will replace the abandoned Taft Highway Grid in all subsequent years.

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 2011 consisted of four successive nights of trapping. Trapping was conducted at the Southeast Area Grid on September 27th, 28th, 29th, and 30th, and the Strand Grid was trapped on October 18th, 19th, 20th, 21st. 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 on its abdomen with a non-toxic ink marker and then immediately released.

3.3 Results

Results from the 2011 Tipton kangaroo rat monitoring are summarized in Figure 3.

One Tipton kangaroo rat was captured at the Strand Grid in 2011. Other animals trapped at the Strand Grid were as follows: A total of 63 individual Heermann's kangaroo rats (*Dipodomys heermanni*), 4 San Joaquin grasshopper mice (*Onychomys torridus tularensis*), and 15 deer mice (*Peromyscus maniculatus*).

The trapping effort at the Southeast Area Grid yielded a total of 12 Tipton kangaroo rats, 14 Heermann's kangaroo rats, 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 27 total deer mice captured also includes recaptures.

3.4 Discussion

The one Tipton kangaroo rat captured at the Strand Grid is rather typical for that grid. Since annual trapping began at this grid in 1996, the number of Tipton kangaroo rats captured each year has ranged from 0 to 4 individuals. In recent years (2006 - 2011), 2 individuals were trapped in 2006, no individuals were trapped in either 2007 or 2008, 4 individuals were trapped in 2009, and no individuals were trapped in 2010 (South Valley Biology 2011). Obviously, the Tipton kangaroo rat population at the Strand Grid is probably relatively small, but it does appear to be stable. There are other areas near the Strand Grid location that could potentially support Tipton kangaroo rats. Some of these areas that have lower shrub densities and more open herbaceous canopies probably support larger numbers of this species.

The Heermann's kangaroo rat population at the Strand Grid was almost identical to what was observed last year. A total of 78 individuals were trapped in 2010 and 77 were trapped in 2011. The very similar vegetation conditions observed at the grid in both 2010 and 2011 probably has a lot to do with the similar results. The livestock grazing program at KWB has been successful at opening up the herbaceous canopy by controlling excessive growth of annual non-native herbaceous species. This has led to more favorable conditions for kangaroo rats. However, the high density of allscale (*Atriplex polycarpa*) on the grid is more favorable to Heermann's kangaroo rats than to Tipton kangaroo rats. Still, with continued herbaceous vegetation controls, it is expected that the chance of increasing the Tipton kangaroo rat population should be possible.

The results from the first season of trapping at the newly established Southeast Area Grid in 2011 should be considered as a baseline for this grid. It should also be noted that the Tipton kangaroo rat population was likely experiencing an upward trend in 2011 and the 12 individuals captured in 2011 may be at or near the peak. For example, a record high of 122 individual Tipton kangaroo rats were captured at the nearby Coles Levee Ecosystem Preserve during the 2011 annual monitoring effort (South Valley

Biology 2012, *in prep.*). This suggests that the species population was high throughout the area in 2011. The habitat at the Southeast Area Grid is high quality native and non-native herbaceous vegetation with a sparse cover of low-growing annual shrubs. Such conditions are ideal for Tipton kangaroo rats and these types of habitats require little to no vegetation maintenance to maintain ideal conditions. Therefore, there was no need to conduct any livestock grazing at this grid. In fact, it is highly likely that grazing may never be needed there unless successive seasons of high precipitation were to result in excessive growth of non-native grasses. However, due to the moderately alkali sink conditions on the grid, it would be unlikely that vegetation could become so dense as to be detrimental to the Tipton kangaroo rat population. Future monitoring of the grid will provide valuable insight into the population dynamics of Tipton kangaroo rats at the Southeast Area Grid.

4.0 SENSITIVE HABITAT BOTANICAL MONITORING

Four 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*), and slough thistle (*Cirsium crassicaule*). Of these, only slough thistle has not been reported in recent times. The KWB also contains habitat for several other special-status plant species (see KWBA HCP/NCCP, Volume II, Section III-1).

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 2010 – 2011 rain year (October 1, 2010 – September 30, 2011) in the Bakersfield area, the total precipitation was 10.33 inches (approximately 159% of the long-term average of 6.49 inches).

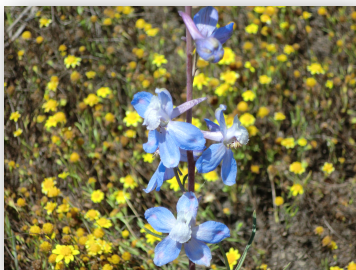


There are three known occurrences of San Joaquin woollythreads within the sensitive habitats and compatible habitats sectors at the KWB. All three occurrences are monitored annually by conducting site visits during the blooming period (typically late February to early April) and collecting basic data such as the number of individual plants, vigor and phenological stage at the time of the site visit. In 2011, because of the heavy early-season rains and resulting anticipated dense growth of non-native herbaceous species, initial site visits to observe germination of woollythreads plants were conducted in January. This was done in anticipation that the rapidly growing non-native species may potentially flourish and preclude the germination and growth of woollythreads.

Site visits were made to all three occurrences with the same common results. Many young, vegetative plants were observed at all three occurrences in early January 2011, however, the aggressively-growing non-native herbaceous plants rapidly overtook the

woollythreads plants. As a result no woollythreads plants were ever observed during subsequent site visits conducted in late January or during follow-up surveys in February and March. This was almost certainly due to the huge amount of rain that fell early in the season (5.82 inches in December alone). It appeared that the grasses and other non-native herbaceous plants were able to exploit the abundant early rains and crowd out the woollythreads populations. It is likely that if the rain had fallen later in the season, there may have been a beneficial effect for the woollythreads populations, however, the European annuals germinate sooner and grow faster than San Joaquin woollythreads, especially when the environmental conditions are so heavily in favor of the non-natives.

Annual surveys for San Joaquin woollythreads will continue in 2012. There will be special efforts made to identify new occurrences of San Joaquin woollythreads in 2012, provided environmental conditions are favorable for the species. Regardless of the environmental conditions, the known occurrences will be visited during the winter and spring blooming season in 2012 to document whatever conditions are encountered.



There is one well-documented occurrence of recurved larkspur located in one of the Sensitive Habitat areas on the KWB in the southern ½ of Section 36, north of Taft Highway, west of Interstate 5, just west of the Alejandro Canal. In 2011, conditions were very favorable for recurved larkspur and the population was probably at or near the largest that has ever been observed. The core of this population is located along a crude oil pipeline right-of-way, under electrical transmission lines, in clay soils with alkali

sink scrub vegetation. As was reported in 2010 (also a favorable rain year), approximately 75 plants were observed at this site throughout the March and April blooming period. In addition to the plants observed at this core area, at least 150 other plants were observed in the surrounding area, north and east of the core population to as far as the fence line along the western edge of Interstate 5.

Hoover's woolly-star is known from many locations on the KWB and can be relatively abundant in years of above-normal precipitation. The largest and typically most vigorous populations of this species occur in the Southeast Area, just south of the Ten Section Oil Field, and in the habitat areas north of Taft Highway and east of Enos Lane. In 2011, essentially all populations were healthy, vigorous, and appeared to take advantage of the abundant rainfall. The only exception was at populations where the non-native grasses and other herbaceous species had gotten off to an earlier start and overgrown their native competitors. These observations were made in the more disturbed areas that typically support only smaller populations of Hoover's woolly-star.





Horn's milk-vetch (*Astragalus hornii* var. *hornii*) was first observed on the KWB by biologists from SVB in 2009. It was probably present prior to that time, but specific locational information on any occurrences is lacking. The California Dept. of Fish and Game's Natural Diversity Database (CDFG 2012) indicates one reported occurrence from 1958 that appears to have been on land that is today part of the KWB, in the vicinity of the KWB canal. Natural habitats for

Horn's milk-vetch are areas that are intermittently flooded but dry late into the season, such as lake margins or playas with moderately alkaline conditions. The recharge basins and canals on the KWB are similar enough to these native habitats and the plant has adapted to these conditions. It was actually pretty widespread on the KWB in many basins and canals in 2009. In 2010 it was only observed in a few of the recharge basins. No plants were observed in 2011, almost certainly because the KWB was in full to nearly full recharge mode for essentially all of 2011, with the recharge basins and canals containing and conveying water all year. It is expected that the 2012 season will be dry with little or no recharge occurring, therefore, it is likely that Horn's milk-vetch will once again be widespread in many of the basins and canals.












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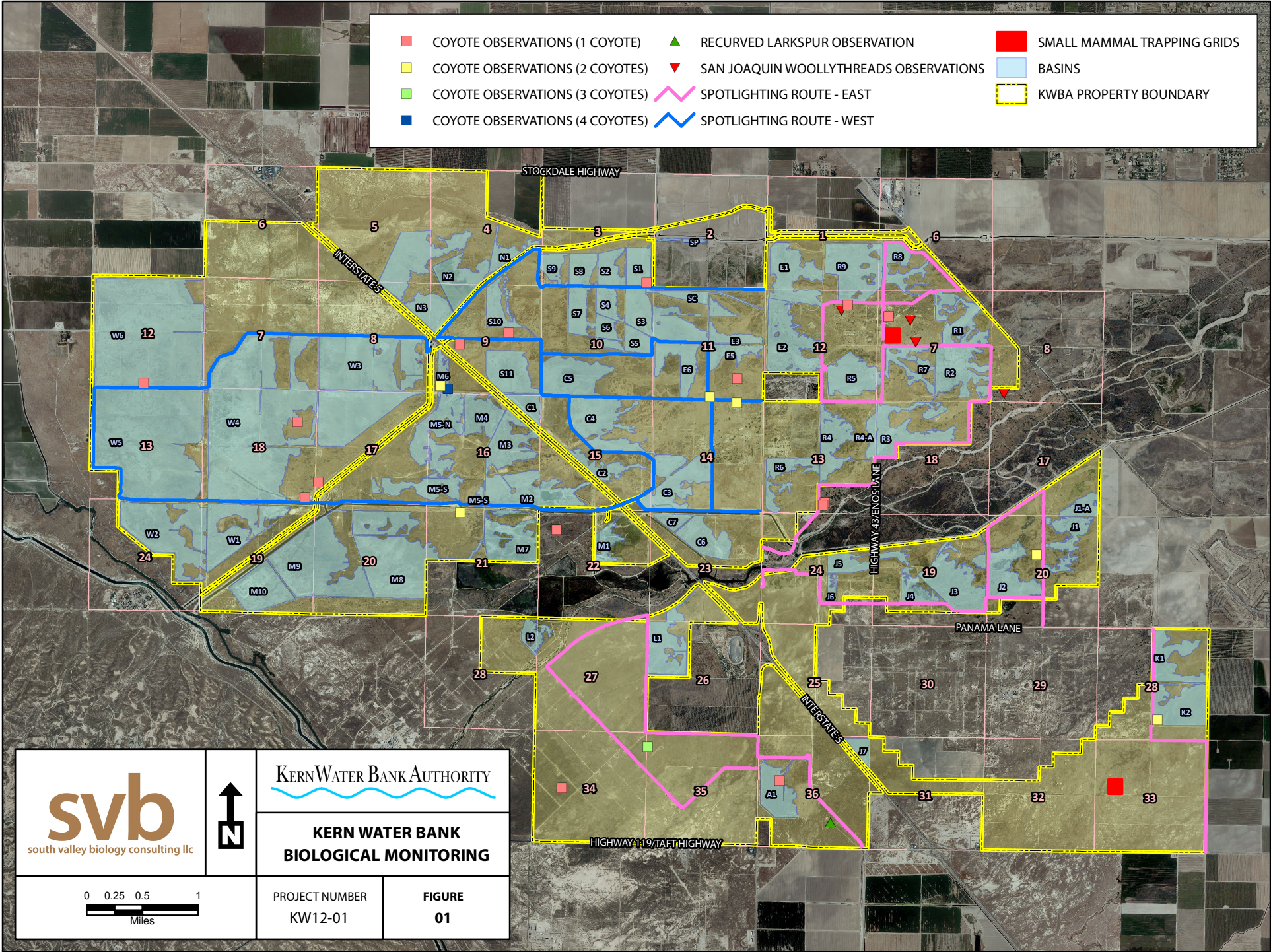
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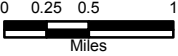
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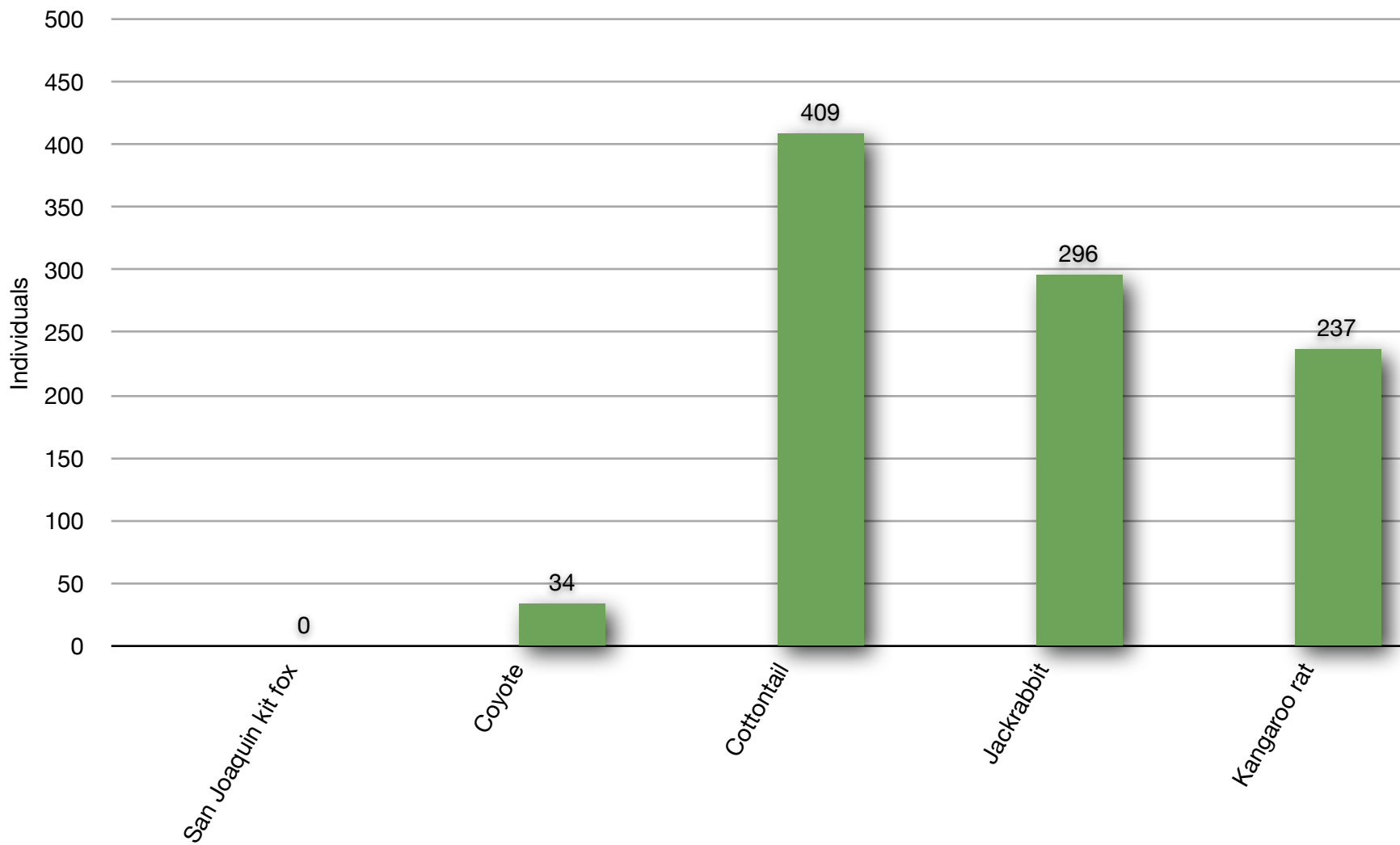
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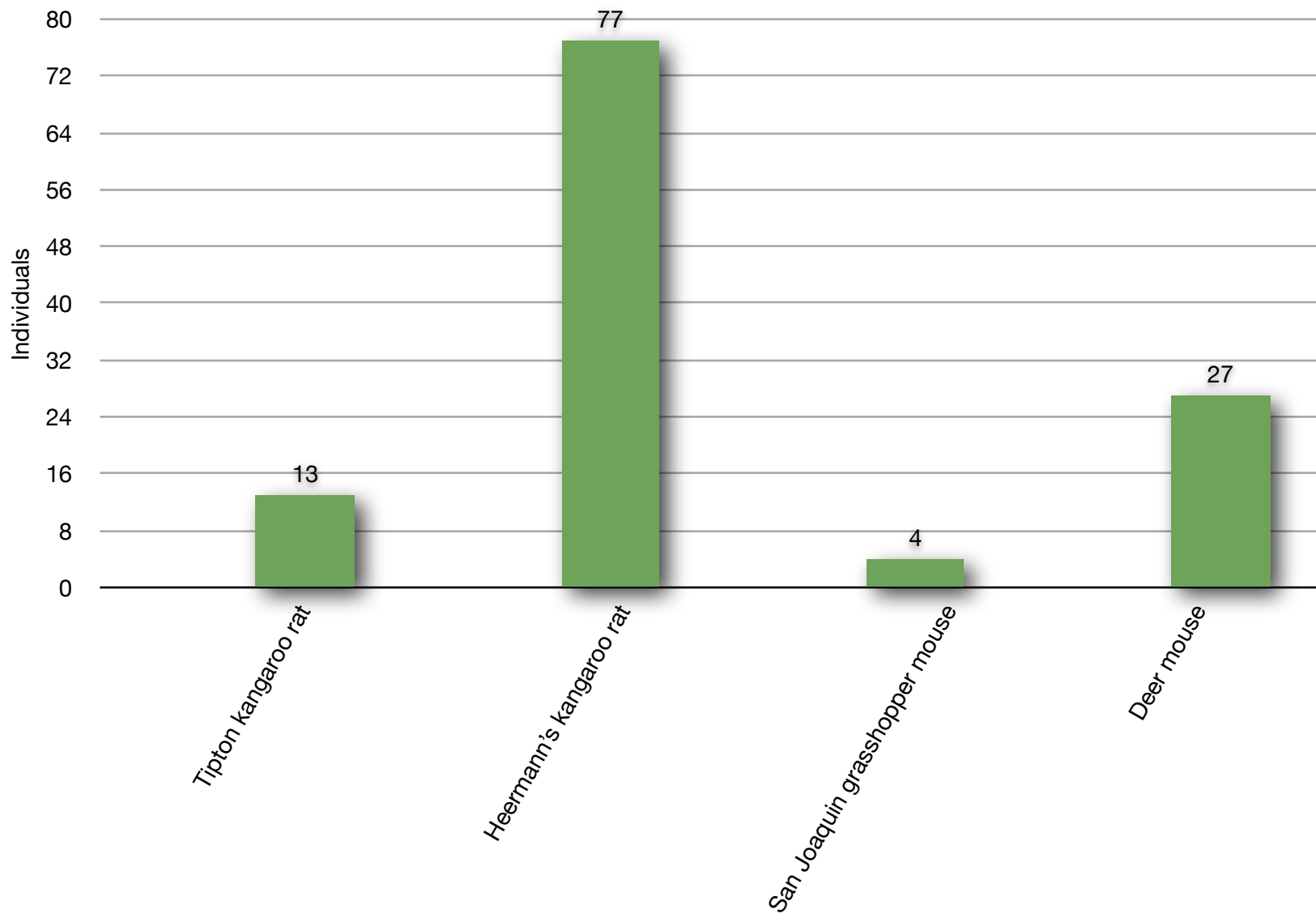
	COYOTE OBSERVATIONS (1 COYOTE)		RECURVED LARKSPUR OBSERVATION		SMALL MAMMAL TRAPPING GRIDS
	COYOTE OBSERVATIONS (2 COYOTES)		SAN JOAQUIN WOOLLYTHREADS OBSERVATIONS		BASINS
	COYOTE OBSERVATIONS (3 COYOTES)		SPOTLIGHTING ROUTE - EAST		KWBA PROPERTY BOUNDARY
	COYOTE OBSERVATIONS (4 COYOTES)		SPOTLIGHTING ROUTE - WEST		



			
		KERN WATER BANK BIOLOGICAL MONITORING	
	PROJECT NUMBER KW12-01	FIGURE 01	



2. Nighttime spotlighting survey results 2011.



3. Tipton kangaroo rat monitoring results 2011.