

Appendix E

Annual Wildlife Monitoring Report for the Kern Water Bank



Mourning Dove (*Zenaida macroura*)

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2018 ANNUAL WILDLIFE MONITORING
REPORT
for the
KERN WATER BANK



Submitted to:

KERN WATER BANK AUTHORITY

Prepared by:

svb
south valley biology consulting llc

July 18, 2019

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KERN WATER BANK

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Introduction

This report documents the results of the 2018 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 contained in this report.

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.

In addition to the prescribed spotlighting surveys, infrared motion camera stations were again used in 2018 to better document kit fox activity on the KWB.

- Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*) 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*), Kern mallow (*Eremalche parryi* ssp. *kernensis*) and other rare plant species monitoring.

San Joaquin Kit Fox Monitoring

Introduction

San Joaquin kit fox monitoring at the KWB in 2018 consisted of nighttime spotlighting surveys conducted on established routes located throughout the KWB. These surveys are conducted annually to provide an index of San Joaquin kit fox presence on the property. 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 property. The main predator/competitor species for the San Joaquin kit fox on the KWB are coyotes (*Canis latrans*), bobcats (*Felis rufus*), and American badgers (*Taxidea taxus*). Although the non-native red fox (*Vulpes vulpes*) is also known to occur in the region, this species has not been reported for many years at the KWB.

Methodology

Prior to conducting the nighttime spotlighting surveys, all the lesser-travelled areas of the established nighttime spotlighting route were driven by the biologists during daylight hours. This is typically done every season 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 not been any need to significantly alter the established spotlighting route. Figure 1 provides an illustration of the 2018 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 20th, 21st, 27th, 30th, and December 3rd; and 4th. 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). As in prior years, 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 three times each over the six nights, yielding approximately 150 miles of nighttime spotlighting surveys conducted during the 2018 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/competitor 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 using a hand held Global Positioning System (GPS) and later entered into the database.

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.

There were three observations of San Joaquin kit fox made during the 2018 nighttime spotlighting surveys. All observations were made on December 3rd.

A total of 20 coyotes were observed during the surveys on 5 of the 6 survey nights. Observations varied from one to 3 individuals at a given location (Figure 1).

No observations of bobcats or American badgers were made during the 2018 nighttime spotlighting surveys.

Other mammalian species observations made during the 2018 nighttime spotlighting surveys included: 167 desert cottontail (*Sylvilagus auduboni*), 89 black-tailed jackrabbit (*Lepus californicus*), and 24 kangaroo rat (*Dipodomys* spp.).

Several avian species were observed. Birds of prey observations totaled 33 barn owls (*Tyto alba*), 3 great horned owls, 3 burrowing owls (*Athene cunicularia*), 9 northern harriers (*Circus cyaneus*), 6 red-tailed hawks (*Buteo jamaicensis*), and 1 prairie falcon (*Falco mexicanus*). Other avian species included California quail (*Callipepla californica*), cattle egret (*Bubulcus ibis*), great egret (*Ardea herodias*), great blue heron (*Ardea herodias*), killdeer (*Charadrius vociferus*), loggerhead shrike (*Lanius ludovicianus*), and mourning dove (*Zenaida macroura*).

Discussion

It is encouraging that kit foxes were observed during the 2018 nighttime spotlighting surveys. There were no kit foxes seen during the 2017 surveys (SVB 2018). As reported in SVB (2018), the abundant recharge cycle activity that was occurring in 2018 made for more difficulty to identify animals. There was no recharge occurring in late 2018 when the nighttime spotlighting surveys were conducted. At the end of a recharge cycle, vegetation can be quite tall until cattle have had a period of time to graze and trample it down. The tall vegetation can hamper the spotlight surveyors visibility, making it difficult or impossible to see the ground level only a short distance from the vehicle. Although this may have biased the surveys a bit in 2017, it was also very evident that all the available forage produced from the significant precipitation and recharge during 2017 led to higher numbers of prey species which in turn probably explains the large increase in kit fox and coyote observations during the 2018 nighttime spotlighting surveys. The most significant observation during the 2018 nighttime spotlighting surveys was the kit fox observation made in the River Area just east of the R5 Pond. It is not often that kit foxes are observed in the recharge areas of the KWB.

In 2018 SVB biologists placed a total of 8 cameras in several areas spread throughout the KWB. An infrared motion detection camera was placed at each station along with a perforated can of cat food that was securely fastened to the ground with a 12-inch metal stake. All cameras were operated for 12 consecutive days and nights from November 5th through November 17th. Figure 1 shows the locations of the 8 camera stations.

San Joaquin kit fox was photographed on numerous occasions at the camera station located within the conservation bank lands in the Southeast Area, south of the K2 Pond (Figure 1). One and sometimes two individuals were photographed on several nights at this camera station which included November 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 14th, 15th,

16th, and 17th. Coyotes were plentiful once again in 2018, visiting 6 of the 8 scent stations. The number of individuals photographed ranged from one to three individuals in the same frame. No bobcats or American badgers were photographed at any of the camera stations in 2018.

Other wildlife species photographed included black-tailed jackrabbit, desert cottontail, kangaroo rat, striped skunk (*Mephitis mephitis*), common raven (*Corvus corax*), and western meadowlark (*Sturnella neglecta*). Representative photographs of some of the wildlife from the camera station monitoring are provided below.



San Joaquin kit fox at scent station in conservation bank.



Striped skunk at scent station in conservation bank.



Two kit foxes at scent station in conservation bank.



Coyote at scent station in recharge area.



Coyote with partial tail missing.



Jackrabbit at scent station in recharge area.

Tipton Kangaroo Rat Monitoring

Introduction

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.

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 2018 consisted of four successive nights of trapping. Trapping was conducted at the Southeast Area Grid on August 28th, 29th, 30th, and 31st; while the Strand Grid was trapped on September 25th, 26th, 27th, and 28th. This technique yielded a total of 1,152 trap nights.

A 15-inch x 4-inch x 4.75-inch 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 to provide insulation and bedding material for the captured animals. The traps were baited and set in the evening and checked just prior to sunrise the following morning. Two biologists worked independently on separate trap rows and checked 72 traps each morning. This technique was utilized to help reduce the handling time and minimize stress to the captured animals. Each captured animal was identified to species and the individual's 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 at the site of capture. 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 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 intended to minimize potential exposure to Hantavirus.

Results

Results from the 2018 Tipton kangaroo rat monitoring are summarized in Figure 3.

No Tipton kangaroo rats were captured at the Strand Grid in 2018. Other animals trapped at the Strand Grid were as follows: 52 Heermann's kangaroo rats (*Dipodomys heermanni*), 1 Tulare grasshopper mouse (*Onychomys torridus tularensis*), and 3 deer mice.

The trapping effort at the Southeast Area Grid yielded a total of 43 Tipton kangaroo rats, 15 Heermann's kangaroo rats, 1 San Joaquin pocket mouse, and 2 deer mice.

Discussion



Adult Tipton kangaroo rat

The Tipton kangaroo rat populations at KWB in 2018 appeared to be healthy and robust, with 43 individuals trapped in 2018 at the Southeast Area Grid.

This was only slightly lower than the 46

individuals trapped the

previous year in 2017 at the Southeast Area Grid (SVB

2018). Although no Tipton kangaroo rats were trapped at

the Strand Grid in 2018, this is not unusual, as there are always only a few to zero trapped at that grid most years. This is likely because a large portion of the Strand Grid has become increasingly dominated by dense stands of mature saltbush shrubs, while the Southeast Area Grid is more or less naturally maintained as high quality Alkali Sink Scrub habitat. The numbers of Heermann's kangaroo rats in 2018 (15) were similar to what were trapped in 2017 (19) at the Southeast Area Grid; however, there was a significant decrease (-62%) in the number of Heermann's kangaroo rats trapped in 2018 (52) from the 157 individuals trapped in 2017. Reasons for this are not clear, but the increasing density in large saltbush shrubs is likely a contributing factor. Although it is widely known that Heermann's kangaroo rats tend to be better at utilizing dense shrubby areas than the Tipton kangaroo rat, there probably comes a point when even the Heermann's kangaroo rat may be negatively affected by this factor.



Juvenile San Joaquin pocket mouse

Sensitive Habitat Botanical Monitoring

Introduction

Six 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*), Kern mallow (*Eremalche kernensis*), Horn's milk-vetch (*Astragalus hornii* var. *hornii*), and slough thistle (*Cirsium crassicaule*). Each year SVB biologists conduct site visits to known populations of the special-status species on the KWB. These site visits continue throughout the late winter and into the early summer and beyond in favorable rainfall years.

The 2017- 2018 rain year (October 1, 2017 - September 30, 2018) was not a favorable year for special-status plants in Kern County. Only 3.95 inches of precipitation was recorded for the Bakersfield area. This is just 65% of the long-term normal of 6.12 inches. As a result, most populations of special-status plants produced fewer plants that were much less vigorous than what was reported for 2017 (SVB 2018).

San Joaquin woollythreads is the earliest to germinate and bloom of all the special-status plants at KWB. Germination is often quite variable, but in most years with adequate precipitation, individual plants begin to germinate in late January or early February. SVB commenced monitoring of known San Joaquin woollythreads populations at KWB on February 7th. As was seen in 2017, several hundred plants were observed at the known populations of this species. However, in 2018 the plants were all very small compared to plants in 2017 (SVB 2018). Regular visits continued throughout most of the flowering period for San Joaquin woollythreads, and on each occasion plants were observed up until April 9th. The plants were still quite small in stature, but many were in full bloom. Many plants had begun flowering by February 13th. By March 6th essentially all plants were in full bloom. 2017 was an exceptionally favorable year for San Joaquin woollythreads at KWB.



San Joaquin woollythreads vegetative stage (Feb. 7, 2018)



San Joaquin woollythreads vegetative stage (Feb. 20, 2018)



San Joaquin woollythreads flowering stage (Mar. 28, 2018)



San Joaquin woollythreads late-flowering/fruiting stage (Apr. 3, 2018)

Site visits to several known populations of Hoover's woolly-star on the KWB in 2018 did not reveal any plants. It is likely that precipitation was not adequate for this species as Hoover's woolly-star seeds are widely known to remain dormant when rainfall is significantly below normal.

Recurved larkspur occurs at the KWB within one sector of the conservation bank lands on both the eastern and western sides of the Alejandro Canal. This is an area that supports alkali sink scrub habitat that is ideal for this species. In 2018, only 5 plants were observed. The plants were first observed on April 3rd. All the plants were small, vegetative, in the "rosette" stage of growth. Two of the plants were already drying out. Two follow-up site visits to this population were unsuccessful at locating any additional plants and it is likely that the plants that were observed on April 3rd had aborted growth for lack of adequate rainfall.



Recurved larkspur vegetative "rosette" stage (Apr. 3, 2018)

Kern mallow was also affected by the low precipitation in 2018, but not as drastically as was observed for the other special-status plants. Vegetative plants were first observed on March 2nd. Plants were small in stature, but there were several hundred individuals observed. Site visits continued into late April with many additional plants observed flowering and fruiting until early May. All plants remained small, with the largest individuals measuring just 10 inches in height. Lastly, one new small population of Kern mallow consisting of about 100 plants was observed in the Southeast Area of the conservation bank in the southeast ¼ of Section 36, Township 30 South, Range 25 East (Figure 1).



Kern mallow in vegetative stage (Mar. 9, 2018)



Kern mallow still in vegetative stage (Mar. 28, 2018).

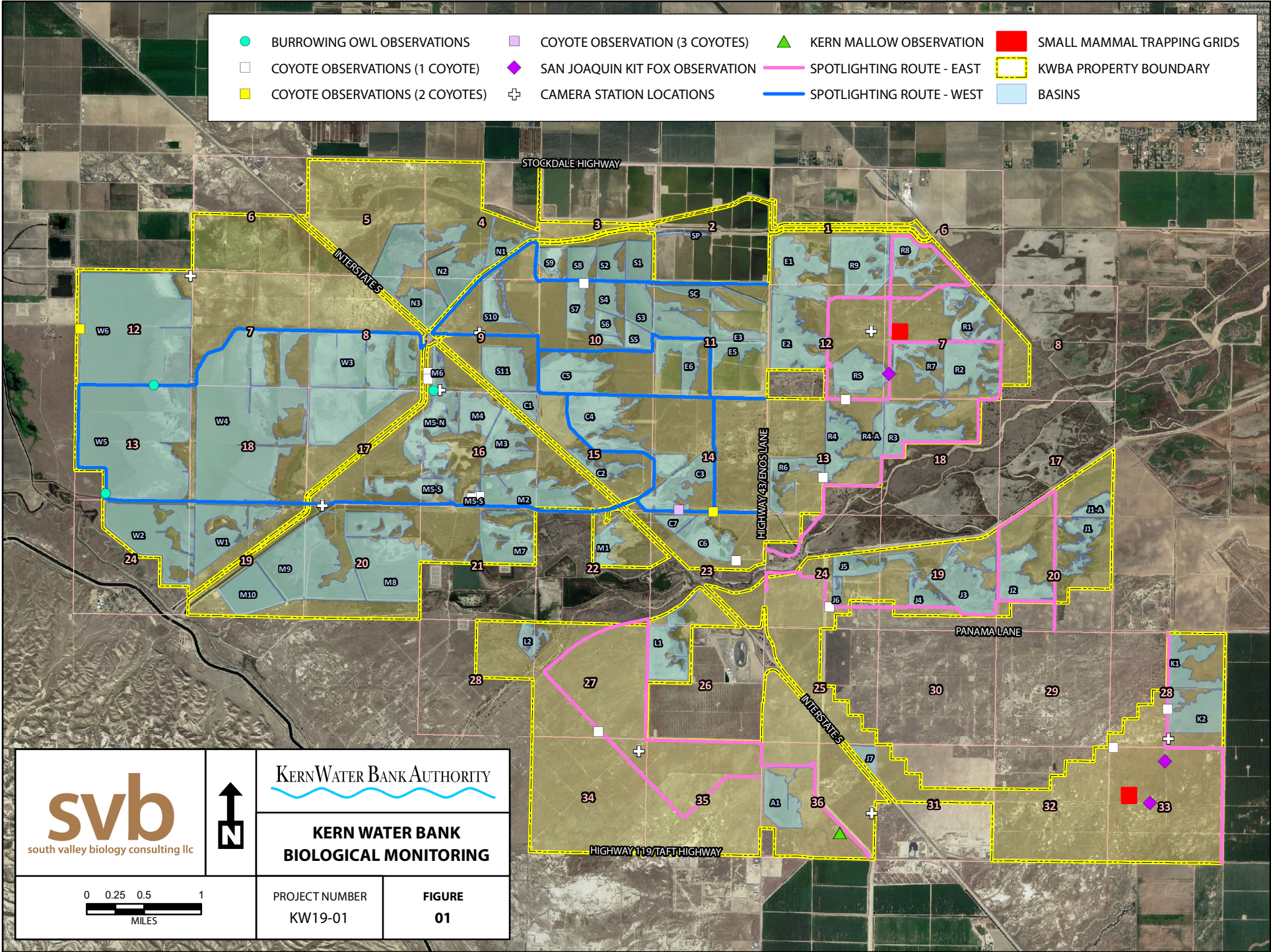
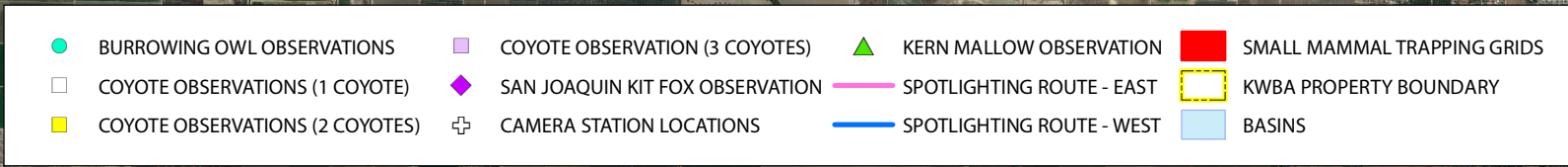




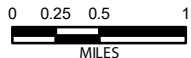
Kern mallow in flowering stage (Apr. 3, 2018).

References

Kern Water Bank Authority. 1997. Habitat conservation plan/natural community conservation plan. Prepared by Kern Water Bank Authority. October 2, 1997.

South Valley Biology Consulting LLC. 2018. 2017 annual wildlife monitoring report for the Kern Water Bank. Prepared by South Valley Biology Consulting LLC for the Kern Water Bank Authority. June 18, 2018.



 south valley biology consulting llc		KERN WATER BANK AUTHORITY	
		KERN WATER BANK BIOLOGICAL MONITORING	
	PROJECT NUMBER KW19-01	FIGURE 01	

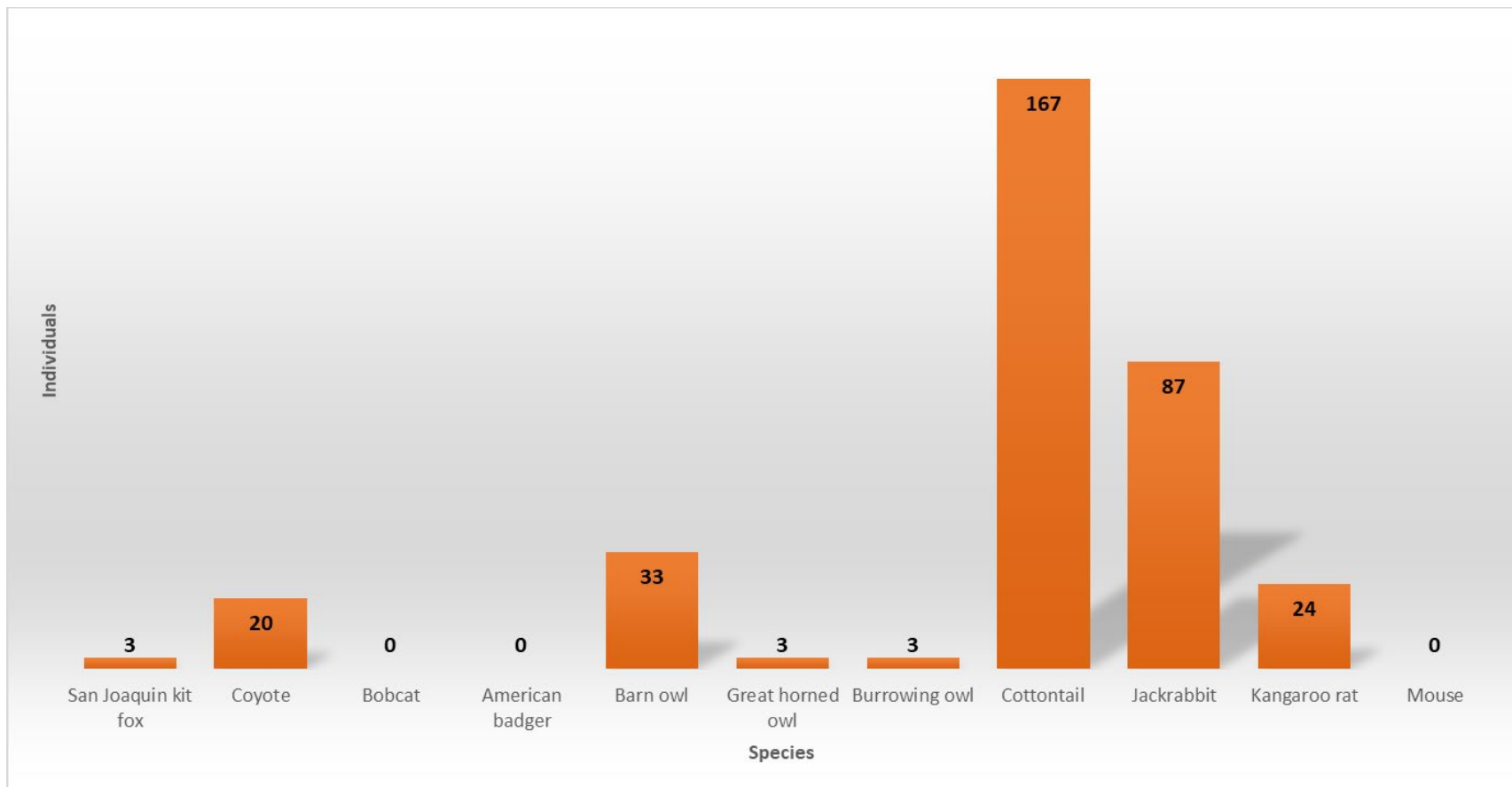


Figure 2. Results of 2018 nighttime spotlighting surveys at the Kern Water Bank.

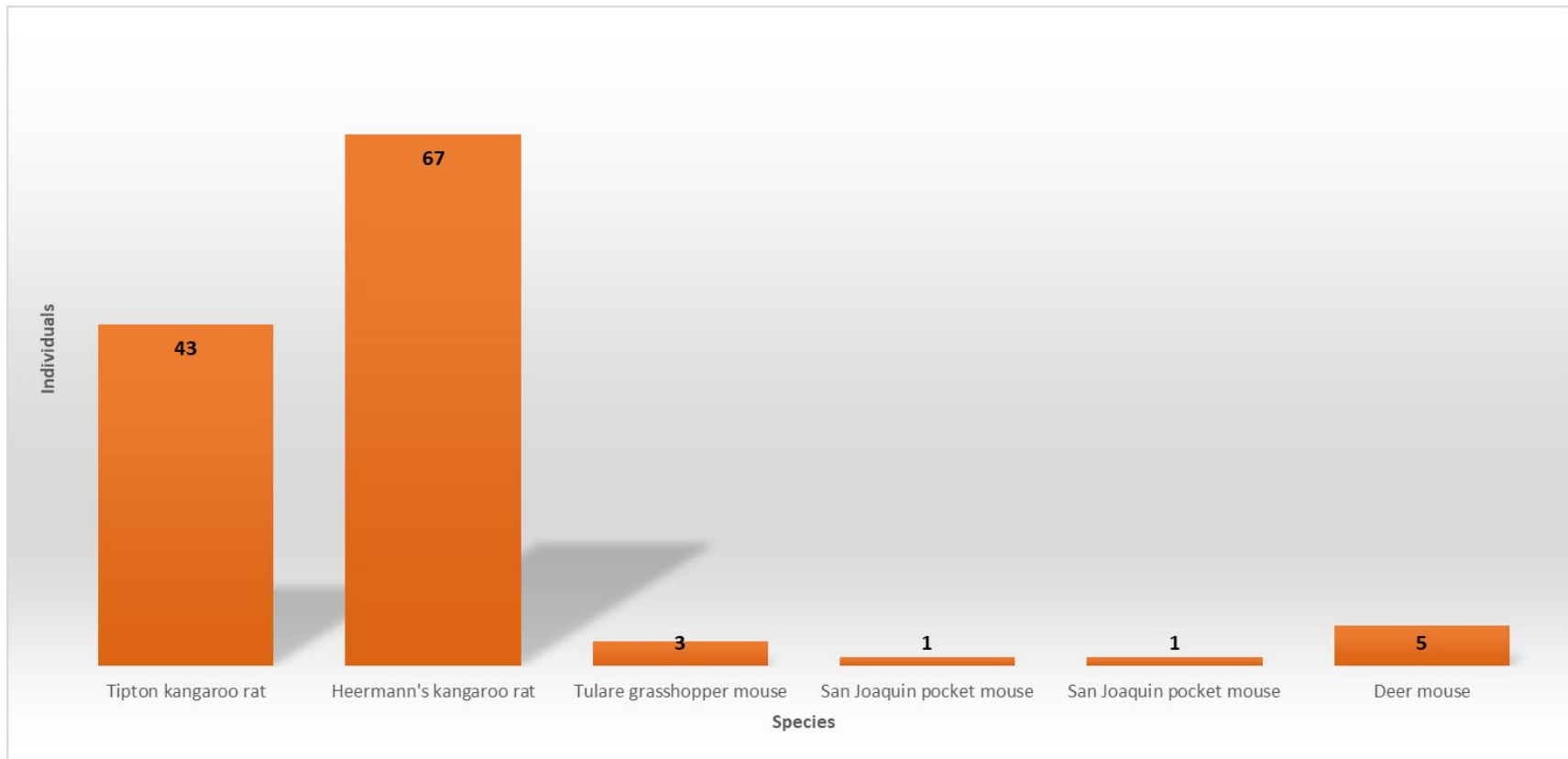


Figure 3. Results of 2018 Tipton kangaroo rat monitoring at the Kern Water Bank.