

DRAFT APPENDIX I: SUPPORT FOR SILVER CREEK RANCH AS MITIGATION LANDS

For the
PANOCH VALLEY SOLAR FARM
San Benito County, California

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PN 1534-04

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1 INTRODUCTION

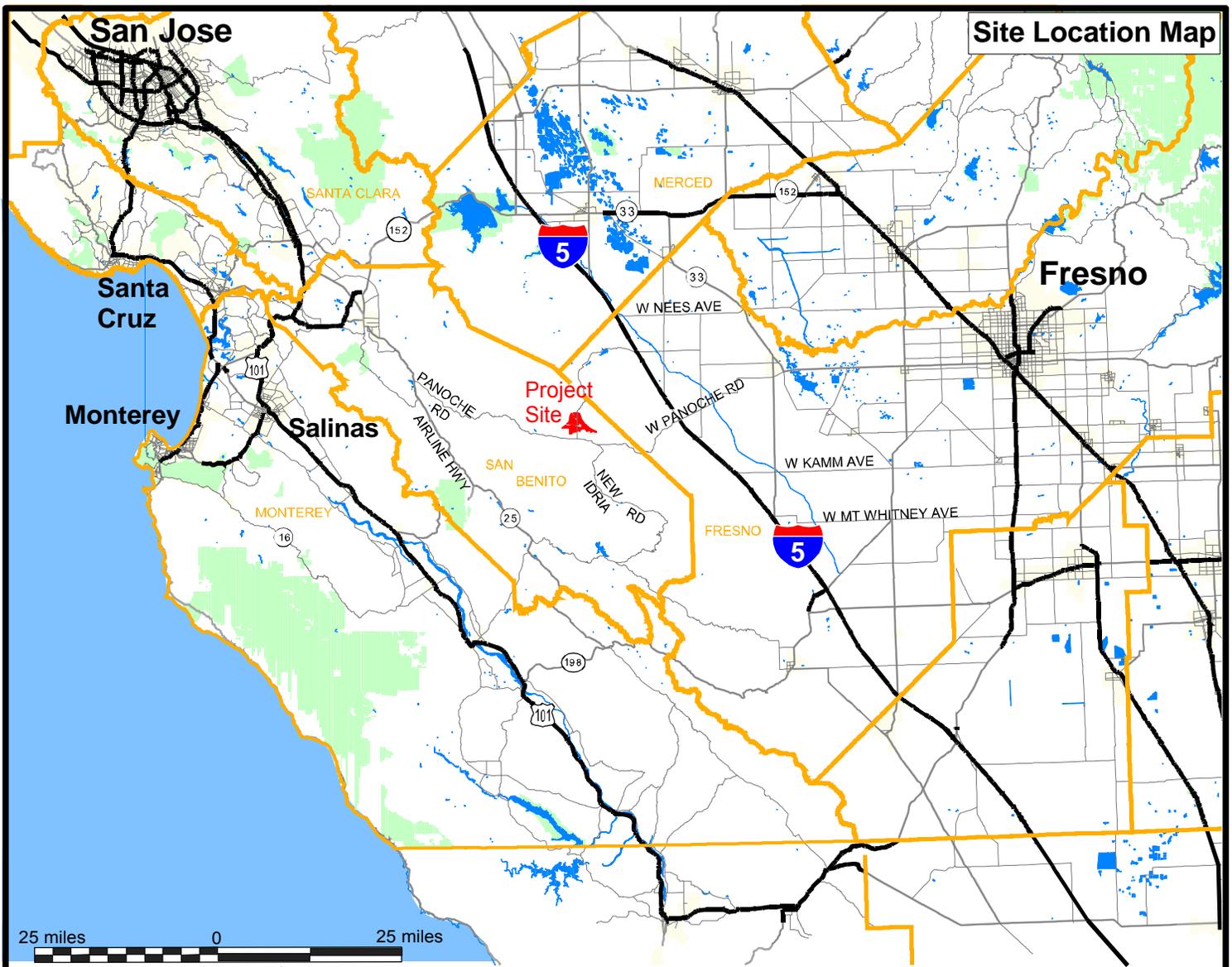
1.1 PROJECT BACKGROUND

The Applicant, Panoche Valley Solar LLC (formerly Solargen Energy, Inc.) intends to construct a utility-scale, photovoltaic (PV) solar energy production facility on the approximately 2,813-acre Project site, reduced from the original acreage of 4,885 acres (stated in the Final Environmental Impact Report), in the Panoche Valley, San Benito County, California (Figure I-1). The construction and operation of the Panoche Valley Solar Project (Proposed Project or Project) may result in the incidental take of species listed as threatened or endangered under the Federal Endangered Species Act and/or the California Endangered Species Act.

The Proposed Project evolved during San Benito County's 13 month environmental review process under the California Environmental Quality Act (CEQA). The Proposed Project was initially to produce 1,000 megawatts (MW) of PV solar energy from a facility incorporating approximately 10,000 acres of the Panoche Valley. However, in response to concerns about the size of the Proposed Project, it was reduced in size by approximately 60 percent from 1,000 MW on 10,000 acres, to 420 MW on approximately 4,700 acres. San Benito County then prepared a Draft Environmental Impact Report (DEIR) pursuant to CEQA which analyzed the environmental impacts of a 420 MW Project. The DEIR was made available for public comment on June 28, 2010.

The 399-MW Proposed Project footprint is comprised of 4,885 acres (7.6 square miles) in the Panoche Valley located in eastern San Benito County, California. The Proposed Project would be located on heavily grazed rangeland and would generally include development of a solar farm on 2,813 acres of the 4,885 acre footprint, or approximately 50 percent of site (see Figures I-1, I-2, and I-3). Of the 2,813 acres, temporary construction laydown yards would occupy 100 acres and would be reclaimed with native vegetation once construction has completed. Interstitial space between Project infrastructures would incorporate approximately 610 acres, once temporary disturbance areas are reclaimed. The remaining 2,072 acres within the Project boundary would be left undisturbed and designated as the Valley Floor Conservation Lands.

The Valley Floor Conservation Lands would include wildlife movement corridors within onsite drainages and 100-year floodplain totaling 389 acres, as well as 1,683 acres of open space in the southern portion of the Project area, for a total of 2,072 protected acres. These undisturbed areas would remain as open space, and would be managed as onsite conservation areas to maintain and enhance habitat conditions for listed species.



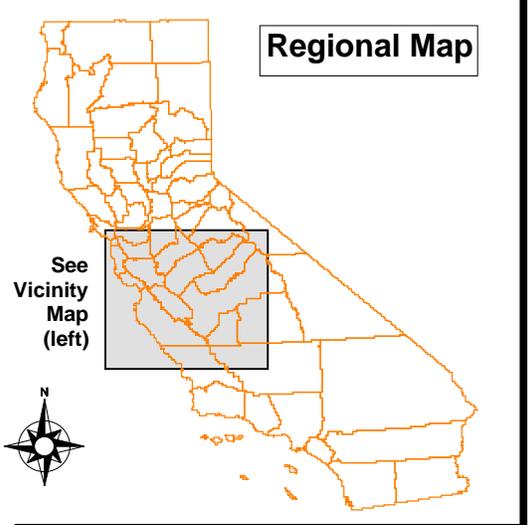
Site Location Map

25 miles 0 25 miles
approximate scale



Vicinity Map

Not to scale



Regional Map

See Vicinity Map (left)

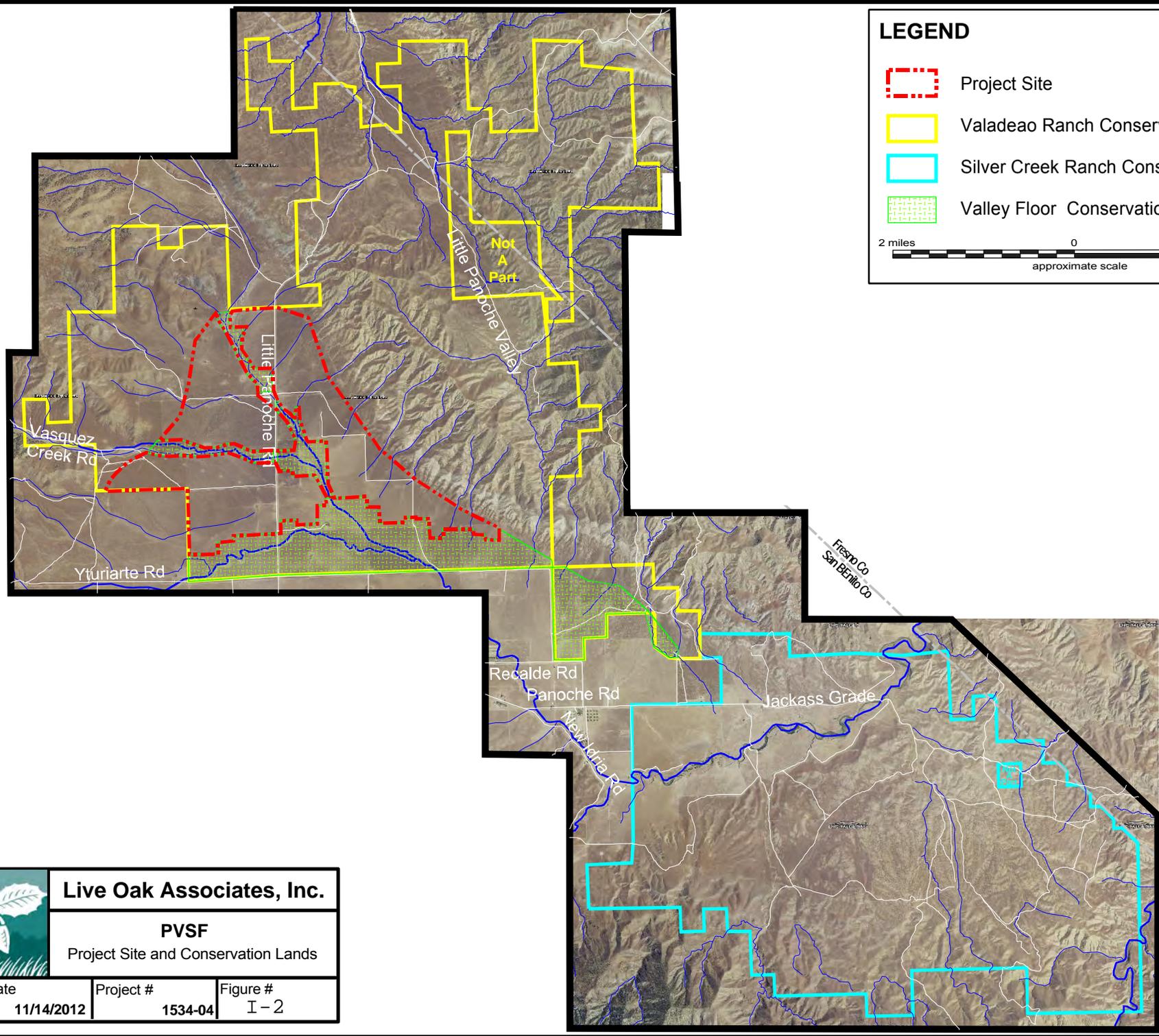


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PVSF Vicinity Map		
Date	Project #	Figure #
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LEGEND

-  Project Site
-  Valadeao Ranch Conservation Lands
-  Silver Creek Ranch Conservation Lands
-  Valley Floor Conservation Lands

2 miles 0 2 miles
 approximate scale

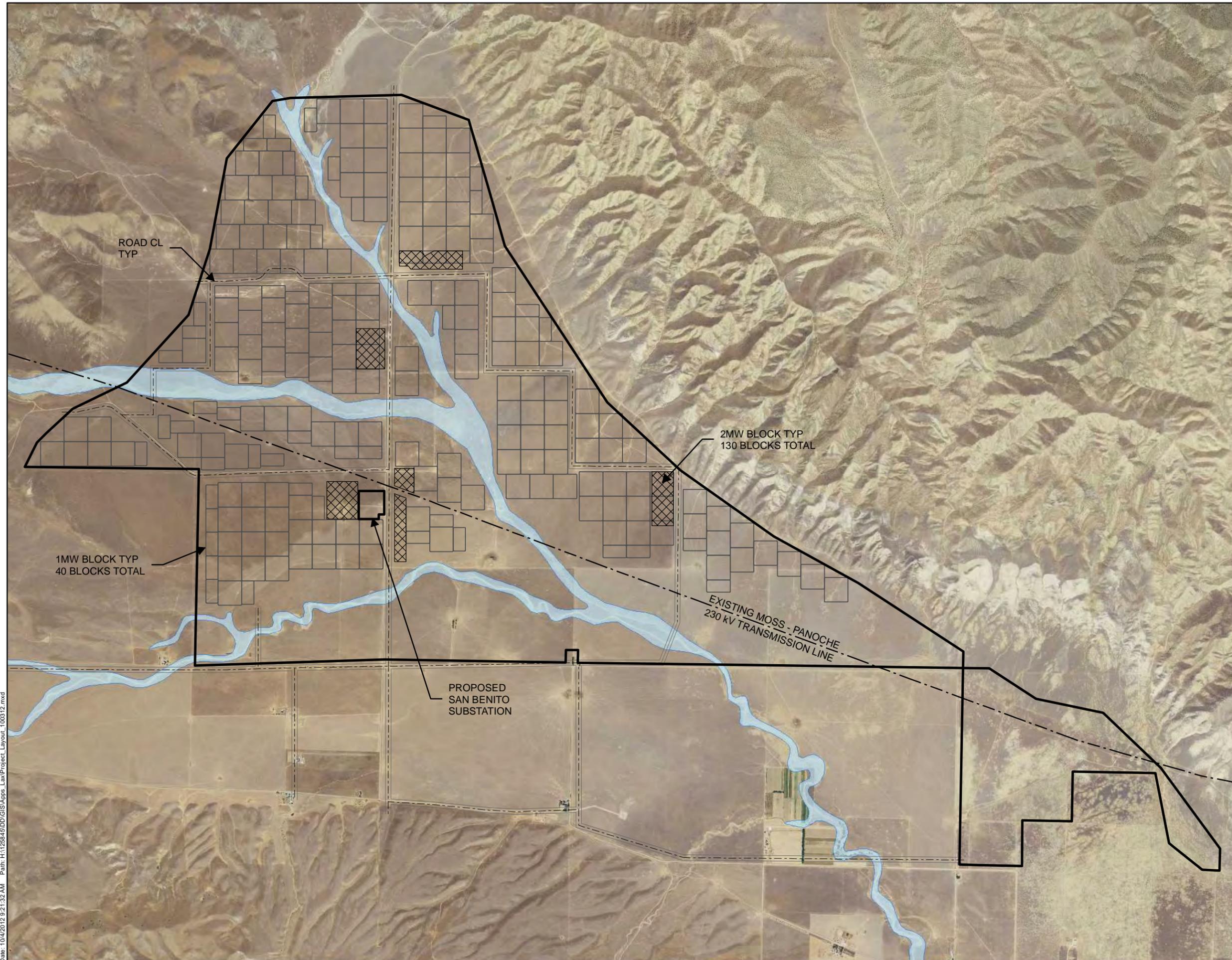
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	PVSF Project Site and Conservation Lands	
Date	Project #	Figure #
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Panoche Valley Solar Farm

Figure I-3 Project Layout

Legend

- Existing Moss-Panoche T-Line
- Panoche Valley Solar Farm Boundary
- 2MW Block
- Substation
- Laydown Areas
- Right of Way
- Centerline
- 100-Year Flood Zone



0 1,250 2,500 5,000

Feet

1 in = 2,500 feet



Date: 10/4/2012 9:21:32 AM Path: H:\25845\DD\GIS\Apps_Lax\Project_Layout_100312.mxd

1.2 OFF-SITE MITIGATION LANDS

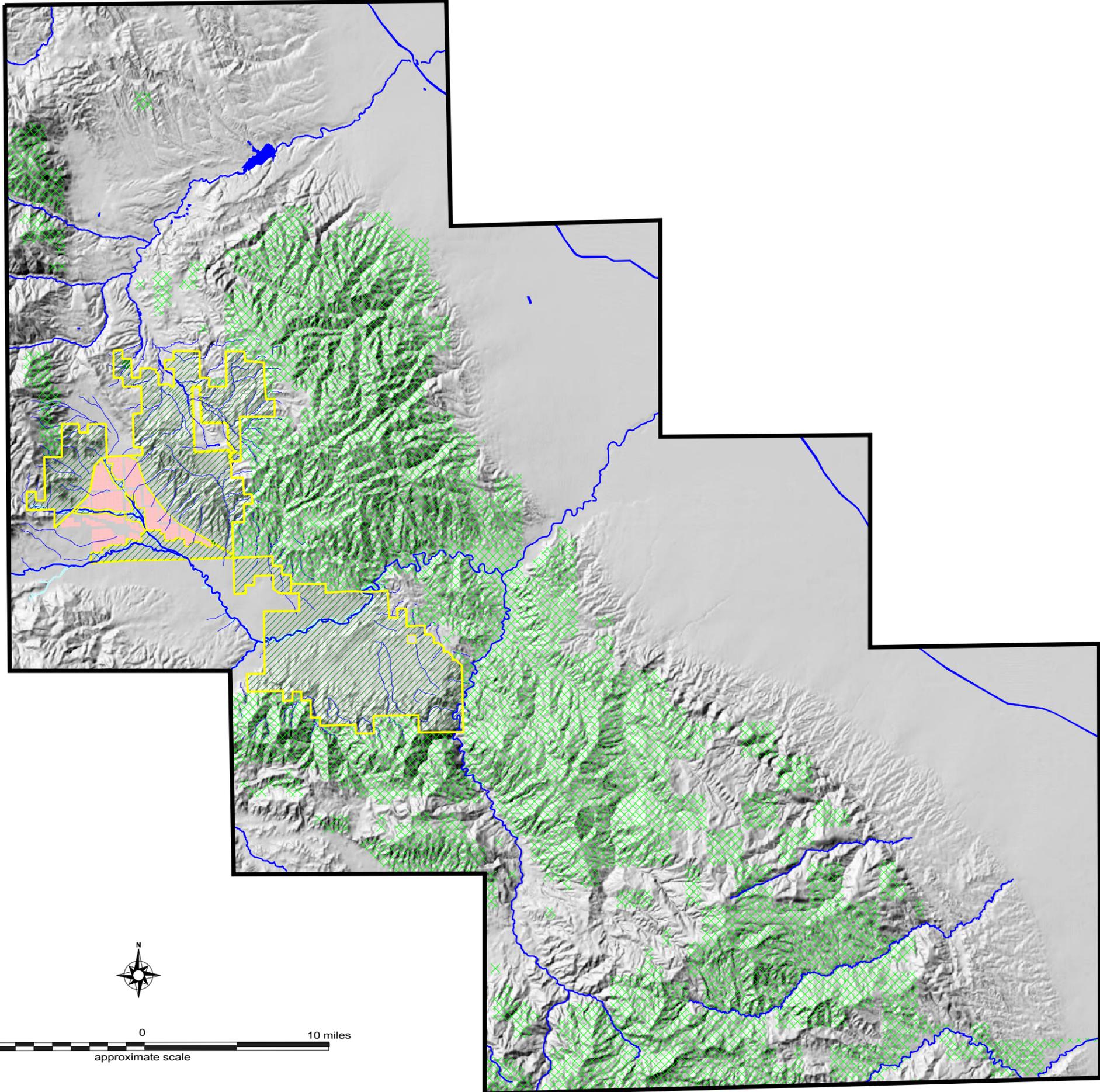
In addition to the designation of the Valley Floor Conservation Lands, the Proposed Project has also retained two large ranches for conservation purposes. These ranches, the Valadeao Ranch Conservation Lands (10,331 acres) and the Silver Creek Ranch Conservation Lands (10,889 acres), are contiguous with the Project site and each other (Figures I-1 and I-2). The Applicant had secured the rights to permanently preserve and manage the mitigation lands in the Panoche Valley known as the Valadeao Ranch prior to the DEIR public comment period. During the DEIR public comment period, the Applicant consulted further with the County, the California Department of Fish and Game (CDFG), the U.S. Fish and Wildlife Service (USFWS), and various experts on the Covered Species regarding additional possible mitigation for unavoidable impacts to sensitive biological resources. The Applicant then identified and secured the rights to permanently preserve and manage additional mitigation lands in the Panoche Valley known as the Silver Creek Ranch.

1.3 SILVER CREEK RANCH LOCATION

The Silver Creek Ranch is located in the Ciervo-Panoche Natural Area in the Panoche Valley along Panoche Road between Hollister and Interstate 5 (Figure I-2). The Silver Creek Ranch is directly south and east of the Project site, adjacent to the Valley Floor Conservation Lands, which is also adjacent to the Valadeao Ranch Conservation Lands (Figure I-2). Elevation on the Silver Creek Ranch ranges from 900 to 2,200 feet, and is mostly surrounded by Bureau of Land Management (BLM) lands with the Griswold Hills to the south, Tumey Hills to the east, and Panoche Hills to the north (Figure I-4), with some adjacent private property as well.

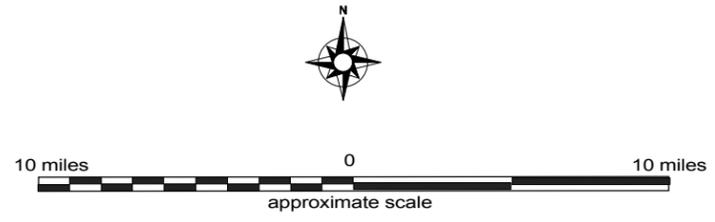
1.4 SILVER CREEK RANCH BACKGROUND

Several published studies have been conducted either on or in the vicinity of the Silver Creek Ranch. No published studies of the blunt-nosed leopard lizard (BNLL) have been published for the Silver Creek Ranch, however, the BNLL 5-year Review (USFWS 2010a) does identify important BNLL habitat near the Silver Creek Ranch. Most published studies are regarding the giant kangaroo rat (GKR) (Grinnell 1932, Hawbecker 1944, Hawbecker 1951, Shaw 1934, Williams and Germano 1992, and Williams et al. 1995). Studies have not been published for the San Joaquin kit fox (SJKF) on the Silver Creek Ranch specifically, however, studies have been published for the SJKF in the general vicinity of the Silver Creek Ranch in the Panoche Valley and Ciervo-Panoche Natural Area (Constable et al. 2009 and Smith et al. 2006).



LEGEND

- Project Development
- Mitigation Lands
- BLM Lands



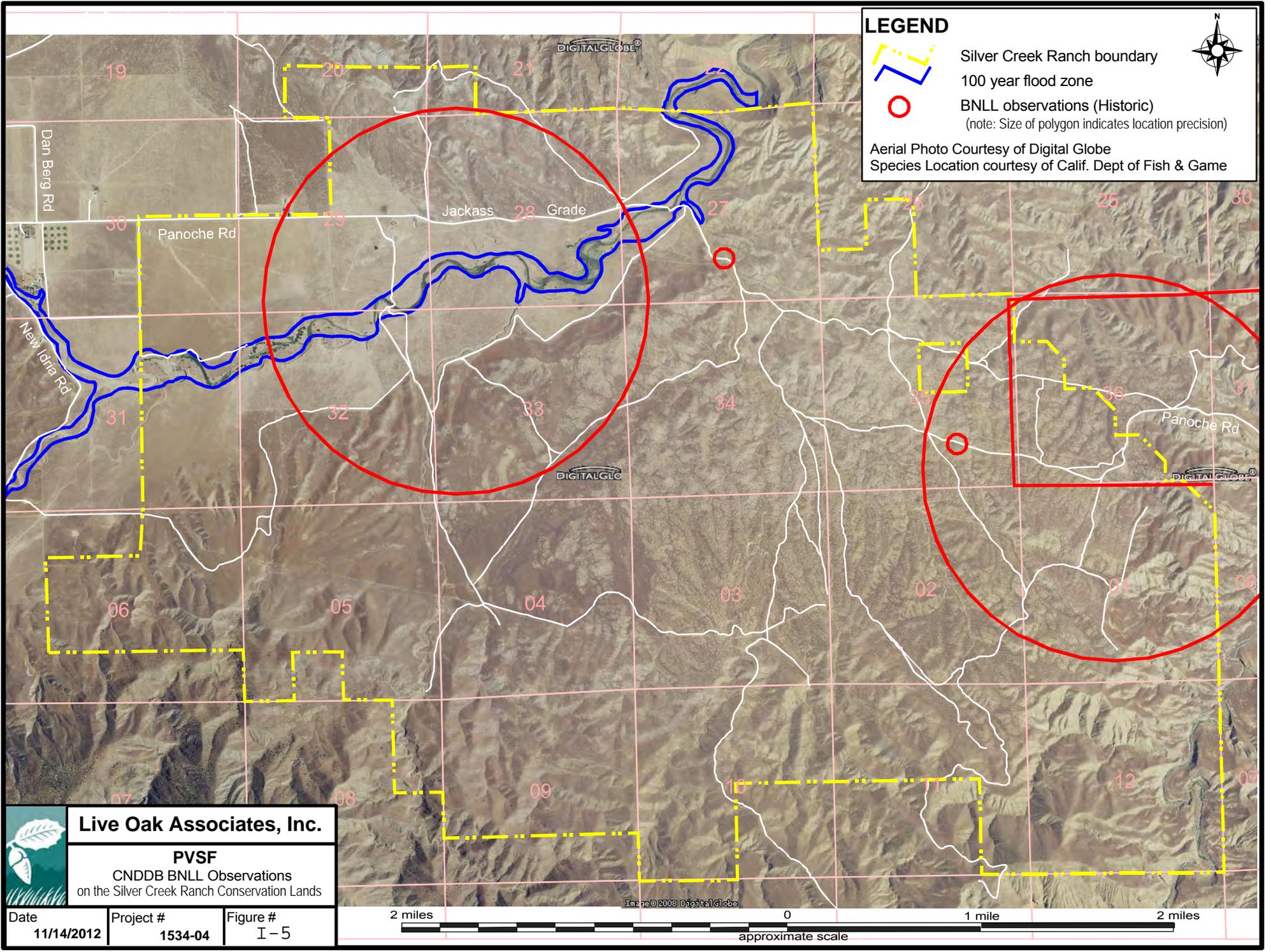
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	PVSF Ciervo-Panoche Natural Area	
Date	Project #	Figure #
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1.4.1 Blunt-nosed Leopard Lizard Background for the Silver Creek Ranch

The BNLL 5-year review (USFWS 2010a) identifies two Areas of Critical Environmental Concern (ACEC) separated by two miles of BLM lands within the Ciervo-Panoche Natural Area, 4,800 acres and 3,800 acres; these ACECs protect contiguous BNLL habitat east of the Silver Creek Ranch. This designation is the highest level of protection the BLM can assign. There are no other published accounts of BNLL in the vicinity of the Silver Creek Ranch, however, the BNLL 5-year review also states that the Panoche Creek and Silver Creek have been identified as important dispersal corridors through the Ciervo-Panoche Natural Area; portions of both creeks flow through the Silver Creek Ranch.

The California Natural Diversity Database (CNDDDB) (CDFG 2012) has records of the BNLL occurring in Cerro Colorado, Chounet Ranch (1958), Hammonds Ranch (1978), Idria (1980), Laguna Seca Ranch (1993), Mercey Hot Springs (2005), Panoche (2004), and Tumey Hills (1993) USGS quads. The years in parenthesis represent the most recent CNDDDB documented occurrence in each quadrangle. There are four records in the CNDDDB of BNLL on the Silver Creek Ranch (Figure I-5).

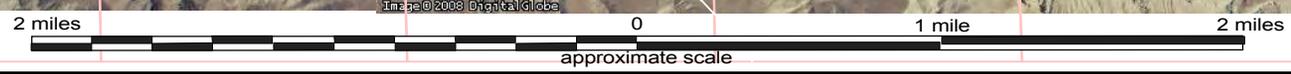
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PVSF
 CNDDDB BNLL Observations
 on the Silver Creek Ranch Conservation Lands

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1.4.2 Giant Kangaroo Rat Background for the Silver Creek Ranch

Grinnell (1932) reported observations of GKR along Panoche Pass in 1932 from 600 feet to close to 1,100 feet in elevation “between Panoche Creek and Silver Creek, and thus a trifle over on the San Benito County side of the boundary between that county and Fresno County”. This location is a description of the eastern side of the Silver Creek Ranch. Grinnell stated that the land was grazed by sheep “to the limit of its carrying capacity”, with bare barren ground, dead shrubs, and soil eroding from the steeper slopes, however, he also stated that GKR “owned” the terrain, as no other seed-eating mammals were observed within the area of GKR precincts. Grinnell counted GKR precincts in three one-acre plots and trapped for GKR. His studies on the Silver Creek Ranch resulted in density estimates for three, one-acre plots of 28, 16, and 21 GKR per acre (Table I-1), caught 36 GKR in 175 trap-nights, noted that they ate “green stuff” and not just seeds when herbaceous vegetation is in the beginning of the growing season, and identified the great horned owl and coyote as predators of the GKR. Grinnell also studied areas near where Panoche Creek leaves the foothills.

TABLE I-1. HISTORIC GKR DENSITY ESTIMATES REPORTED IN THE LITERATURE

LOCATION	ESTIMATED DENSITY (#GKR/ACRE)	ESTIMATED DENSITY (#GKR/HECTARE)	SURVEY PERIOD	PUBLICATION	ADDITIONAL INFORMATION
Panoche Valley region	0.82 to 21.04	0.33 to 8.51	July 1979 to October 1987 <i>Note: Above avg. precipitation</i>	Williams (1992)	2 in 6 hectares
Panoche Creek	3.64	1.47	1986 <i>Note: Above avg. precipitation</i>	Williams (1992)	
Panoche Fan	21.04	8.52	1932 <i>Note: Above avg. precipitation</i>	Williams (1992)	
Panoche Hills	2.43	0.98	1981 <i>Note: Above avg. precipitation</i>	Williams (1992)	
Panoche Valley	0.82	0.33	1979 <i>Note: Above avg. precipitation</i>	Williams (1992)	
Tumey Hills	2.83	1.15	1981 <i>Note: Above avg. precipitation</i>	Williams (1992)	
Near Valadeao Ranch	5.93 and 7.90	2.4 and 3.2	Summer of 1992 <i>Note: Above avg. precipitation</i>	Williams et al. (1995)	
On Silver Creek Ranch*	2.25 to 36.33	0.91 to 14.71	Summer of 1992 <i>Note: Above avg. precipitation</i>	Williams et al. (1995)	

LOCATION	ESTIMATED DENSITY (#GKR/ACRE)	ESTIMATED DENSITY (#GKR/HECTARE)	SURVEY PERIOD	PUBLICATION	ADDITIONAL INFORMATION
On Silver Creek Ranch	2.26 to 36.35 With an average of 11.99	0.91 to 14.72 With an average of 4.85	Summer of 1992 <i>Note: Above avg. precipitation</i>	Williams et al. (1995)	10 colonies were located #28-37; however, population estimates were not calculated for #28.
Valley Floor Conservation Lands and adjacent private land.	No estimate	No estimate	Summer of 1992 <i>Note: Above avg. precipitation</i>	Williams et al. (1995)	No population estimate was made for colony #5.
Panoche Fan along Panoche Creek approx. 5.5 miles to the northeast of Silver Creek Ranch	16, 20, and 28 With an average of 21	6.48, 8.10, and 11.34 With an average of 8.50	February 1932 <i>Note: Above avg. precipitation</i>	Grinnell (1932)	For 3 separate acres

*The 14.71/hectare colony is an outlier, and without it the highest density is 6.92 GKR / hectare.

Shaw's (1934) studies in 1933 involving investigations into GKR seed harvesting and storing was conducted at "Panoche Creek near where it leaves the foothills of the Coast Ranch Mountains and enters the plain, about 50 miles west of the City of Fresno...". This location is in the vicinity of the Silver Creek Ranch. Shaw stated that the land was over-grazed and that "several hundreds of sheep" were trampling the land, however, GKR pit caches remained unharmed. Shaw's studies resulted in descriptions of surface pit caches and excavations of precincts resulted in mapping of precincts including dichotomous burrow systems, surface pit caches, and copious amounts of stored seeds underground; one excavated precinct revealed nine underground caches with a total of almost 35 quarts of seeds.

Hawbecker (1944) studied GKR's relationship to sheep forage six miles east of Panoche and approximately six miles southwest of Grinnell's (1932) and Shaw's (1934) studies took place where Panoche Creek leaves the foothills. This triangulation places Hawbecker's (1944) studies on the Silver Creek Ranch. Hawbecker's studies noted that San Joaquin antelope squirrels (SJAS) were "definitely resident in numbers", and used kangaroo rat burrows; identified San Joaquin kit fox (*Vulpes mutica mutica*), American badger (*Taxidea taxus*), barn owl (*Tyto alba*), and a weasel (*Mustela* sp.) as predators of kangaroo rats; identified seed curing known as haystacks; identified locations of GKR precincts as "high spots of hillsides" or "the tops of 'hog-wallows' in flat country" with occasional activity in low spots; indicated that sheep forage on precincts including old precincts supported better growths than non-precinct areas, causing sheep to preferentially forage on precincts; and indicated that kangaroo rats increase herbaceous sheep forage by five times on precincts than off precincts.

Hawbecker's (1951) examination of small mammal relationships in ephedra community on the Silver Creek Ranch (note: photos within this article show the Silver Creek Ranch topography, though current vegetation consists of less ephedra shrubs than photos in this article) in an area ranging from 1,000 to 1,800 feet elevation. Hawbecker ran transects and observed SJAS present irregularly in the non-shrubby area; identified GKR as the dominant nocturnal small rodent in brushless areas; noted that the "levelness of terrain does not seem to be as important here as the lack of cover"; showed dominance changing to Heermann's kangaroo rat in areas of denser cover; and did not locate GKR on ridges, but did locate them on slopes with less cover on either side of ridges.

Williams and Germano (1992) examined the state of endangered kangaroo rats in the San Joaquin Valley in order to guide recovery planning. One of the sites Williams and Germano surveyed for potential habitat in western Fresno and eastern San Benito counties included the Tumey-Panoche region (which is in the vicinity of the Silver Creek Ranch). These sites were revisited in 1993 and results were reported for GKR by Williams et al. (1995).

Williams et al.'s (1995) study revisited colonies and potential habitat for GKR identified in 1992 by Williams and Germano (1992) in western Fresno and eastern San Benito counties. For the 1992-1993 timespan, an estimate of 37,125 GKR on the study area was calculated, this is an increase from an estimate of 2,000 GKR in 1980-1985; the authors attribute this population increase to the end of a five year drought that ended in 1991. Seventy-nine GKR colonies were identified and mapped. The largest colonies were located on Panoche and Mugata fine sandy-loam soils; however, smaller colonies were located on various other soil types. Ten of these colonies were identified on the Silver Creek Ranch with estimated densities ranging from 2.25 to 36.33 GKR per acre. These colonies are shown in Figure 41 of the *Recovery Plan for Upland Species of the San Joaquin Valley* (USFWS 1998; Recovery Plan) and identified as "source populations".

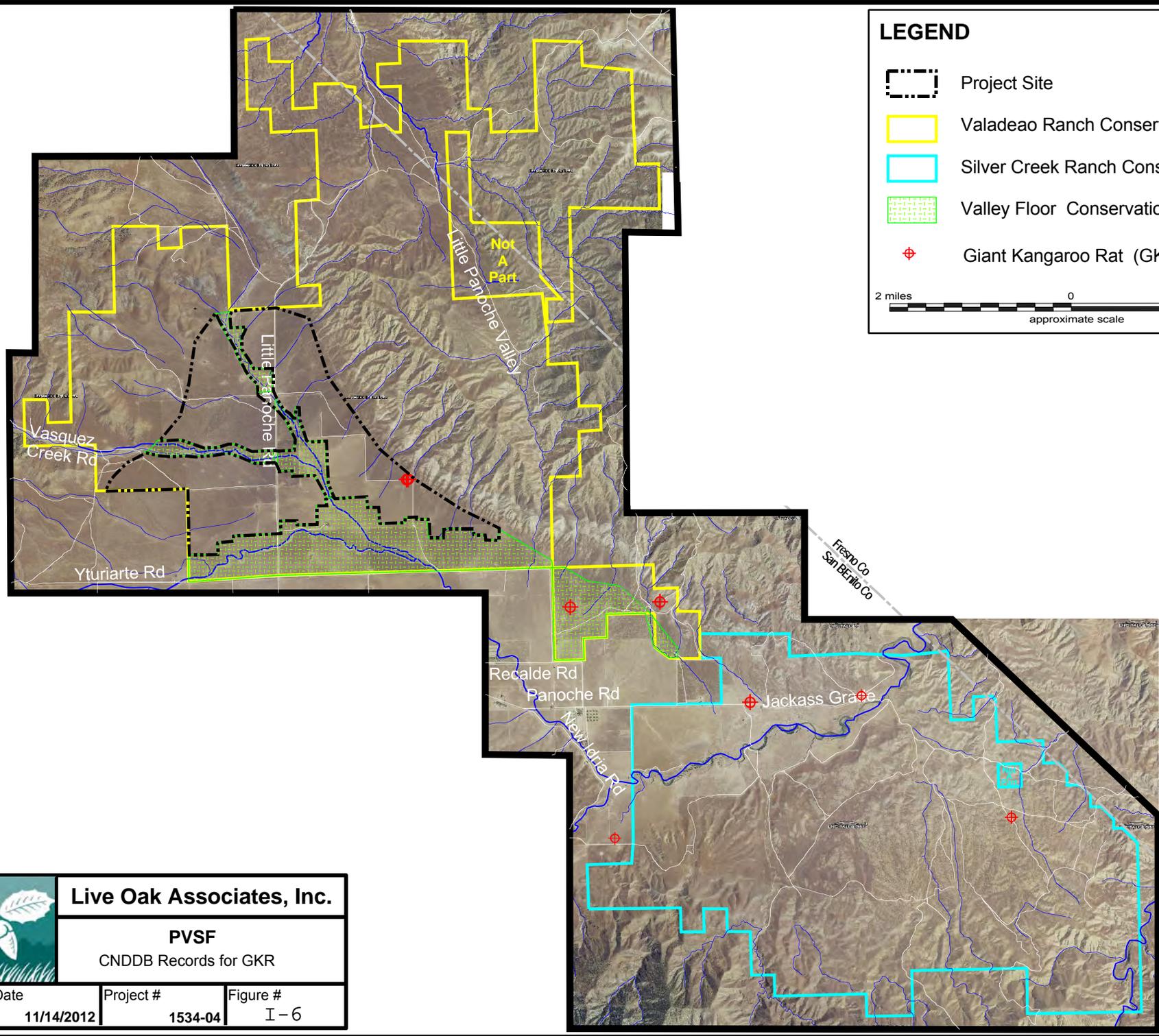
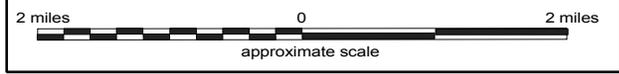
The CNDDDB has records of the GKR occurring in the following USGS quadrangle maps: Chounet Ranch (1958), Idria (1979), Mercey Hot Springs (1992), Monocline Ridge (1992), Panoche (2004), and Tumey Hills (2006). The years in parenthesis represent the most recent CNDDDB documented occurrence in each quadrangle. There are three records in the CNDDDB of GKR on the Silver Creek Ranch (Figure I-6).

1.4.3 San Joaquin Kit Fox Background for the Silver Creek Ranch

No published studies exist for the SJKF on the Silver Creek Ranch, and few published studies exist for SJKF in the vicinity of the Silver Creek Ranch.

LEGEND

-  Project Site
-  Valadeao Ranch Conservation Lands
-  Silver Creek Ranch Conservation Lands
-  Valley Floor Conservation Lands
-  Giant Kangaroo Rat (GKR)

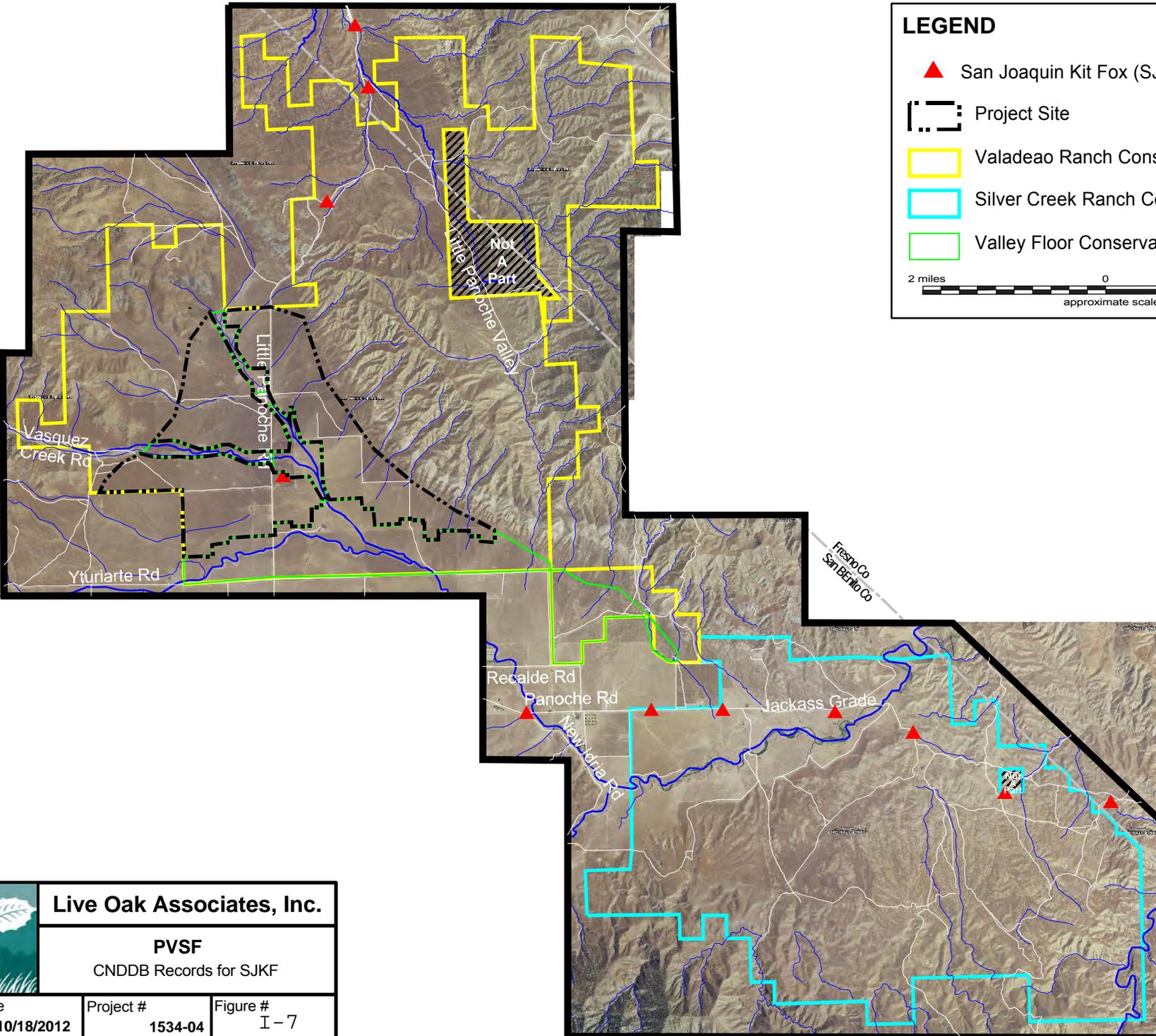


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	PVSF CNDDDB Records for GKR	
Date	Project #	Figure #
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Smith et al. (2006) conducted a study using scat-sniffing dogs throughout the range of the SJKF. The population in the Panoche Valley is of lower abundance and more difficult to detect than in the southern portion of their range. After searching 12 kilometers (km) in the Ciervo-Panoche Natural Area, only 19 scats were located (1.58 scats/km), in contrast, the least dense area searched in the southern portion of the range that was positive for SJKF, Carrizo Plain National Monument, had 4.0 km searched and 221 scats located (55.25 scats/km). The overall difference between the central and southern portions of the range was that out of all the transects searched, the central range had a density of 0.24 scats/km and the southern range had a density of 8.02 scats/km. This indicated that the central region of the SJKF range is much less dense than the southern region.

Constable et al. (2009) conducted a study directed at gaining information about the SJKF population north of Panoche Valley, and found that in Panoche Valley, camera stations captured photos of SJKF 0.4 per 100 camera-nights and track stations captured prints of SJKF 1.5 per 100 station-nights. SJKF were continually observed in these manners. They also observed two road-killed SJKF, one was on Little Panoche Road and one was on Panoche Road; neither of these road-kills were on the Project site, however, one live sighting was either near or on the Project site. They observed a lower abundance of coyotes in Panoche Valley; coyotes are a major source of mortality for the SJKF, so this lower abundance may be why the SJKF population is doing better in Panoche Valley than in some other areas.

The CNDDDB shows 32 records of SJKF occurring within 10-miles of the site from 1958 to 2006, with the majority of these observations occurring along roads. CNDDDB observations were made in the following USGS quadrangle maps: Chounet Ranch (1977), Hammonds Ranch (1920), Idria (1975), Laguna Seca Ranch (2001), Llanada (1994), Mercey Hot Springs (2006), Ortigalita Peak (1975), Panoche (2006), Topo Valley (1987) and Tumey Hills (1989). The years in parenthesis represent the most recent CNDDDB documented occurrence in each quadrangle. There are five records in the CNDDDB of SJKF on the Silver Creek Ranch (Figure I-7).



LEGEND

-  San Joaquin Kit Fox (SJKF)
 -  Project Site
 -  Valadeo Ranch Conservation Lands
 -  Silver Creek Ranch Conservation Lands
 -  Valley Floor Conservation Lands
- 2 miles 0 2 miles
approximate scale



	Live Oak Associates, Inc.	
	PVSF CNDDDB Records for SJKF	
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1.4.4 Recovery Plan and 5-year Review Recommendations

The Silver Creek Ranch is specifically identified in the Recovery Plan (USFWS 1998) and the Recovery Plan 5-year Reviews (USFWS 2010a, 2010b, 2010c), as an area with high habitat value for the Covered Species. The Recovery Plan (USFWS 1998:19) also identifies that the BLM has a program of acquisition in which the Silver Creek Ranch is one of the two main ranches that the BLM has a goal of purchasing (this is later called the Ciervo-Panoche Natural Area in the rest of that document; Figure I-4 shows an approximate outline of the Ciervo-Panoche Natural Area). The Recovery Plan (USFWS 1998), in reference to GKR, also has a goal to “protect all existing natural land on the Silver Creek Ranch...” (Page 95) and in reference to BNLL to “Protect additional habitat for them in key portions of their range; areas of highest priority to target for protection are: ...Natural lands in the Panoche Valley area of Silver Creek Ranch, San Benito County” (Page 122). Even though the Project does not propose to take any BNLL, it will preserve a “highest priority” area by preserving the Silver Creek Ranch. As biological surveys on the Silver Creek Ranch reported in the literature last occurred in 1993, it was determined that more recent data was required to examine present conditions of these species on the Silver Creek Ranch. Section 2 of this report provides 2010 field confirmation of present conditions for Special Status Species on the Silver Creek Ranch.

2 CONFIRMATION OF PRESENT CONDITIONS OF SPECIAL STATUS SPECIES ON THE SILVER CREEK RANCH IN 2010

Although previous literature, including the Recovery Plan (USFWS 1998) and 5-year Reviews (USFWS 2010a, 2010b, 2010c), reports the high density of various special status species on the Silver Creek Ranch, and identifies the Silver Creek Ranch as a key area for conservation in the Ciervo-Panoche Region for these species, current biological information on the Silver Creek Ranch was not available. Therefore, LOA conducted several surveys on the Silver Creek Ranch Conservation Lands in 2010 in order to assess the current conditions on the Ranch. 2010 surveys on the Silver Creek Ranch Conservation Lands were conducted in order to confirm current conditions of special status species on the Silver Creek Ranch; these surveys were qualitative surveys, not quantitative surveys, and were conducted as an initial assessment of the Ranch as potential mitigation land.

Golden Eagle Survey

A survey for golden eagles and their nests was conducted via helicopter on August 6 and 7, 2010. The area surveyed included a 10-mile radius around the 4,885-acre Project site, which includes the 2,813 acres that will be impacted by the Project and the 2,072-acre Valley Floor Conservation Lands. The survey was conducted in accordance with the *U.S. Fish and Wildlife Service Interim Guidelines for Golden Eagle Surveys*. Blue Sky Helicopters of Redlands, CA flew two biologists (Pete Bloom and Scott Thomas) over the site and within a 10-mile radius of the Project site. During the flight, one biologist observed at all times while the other recorded and marked data when appropriate. Two global positioning system (GPS) units, one primary and one backup, were used to

document geographic locations of importance and the routes taken; these coordinates were also entered in field notes.

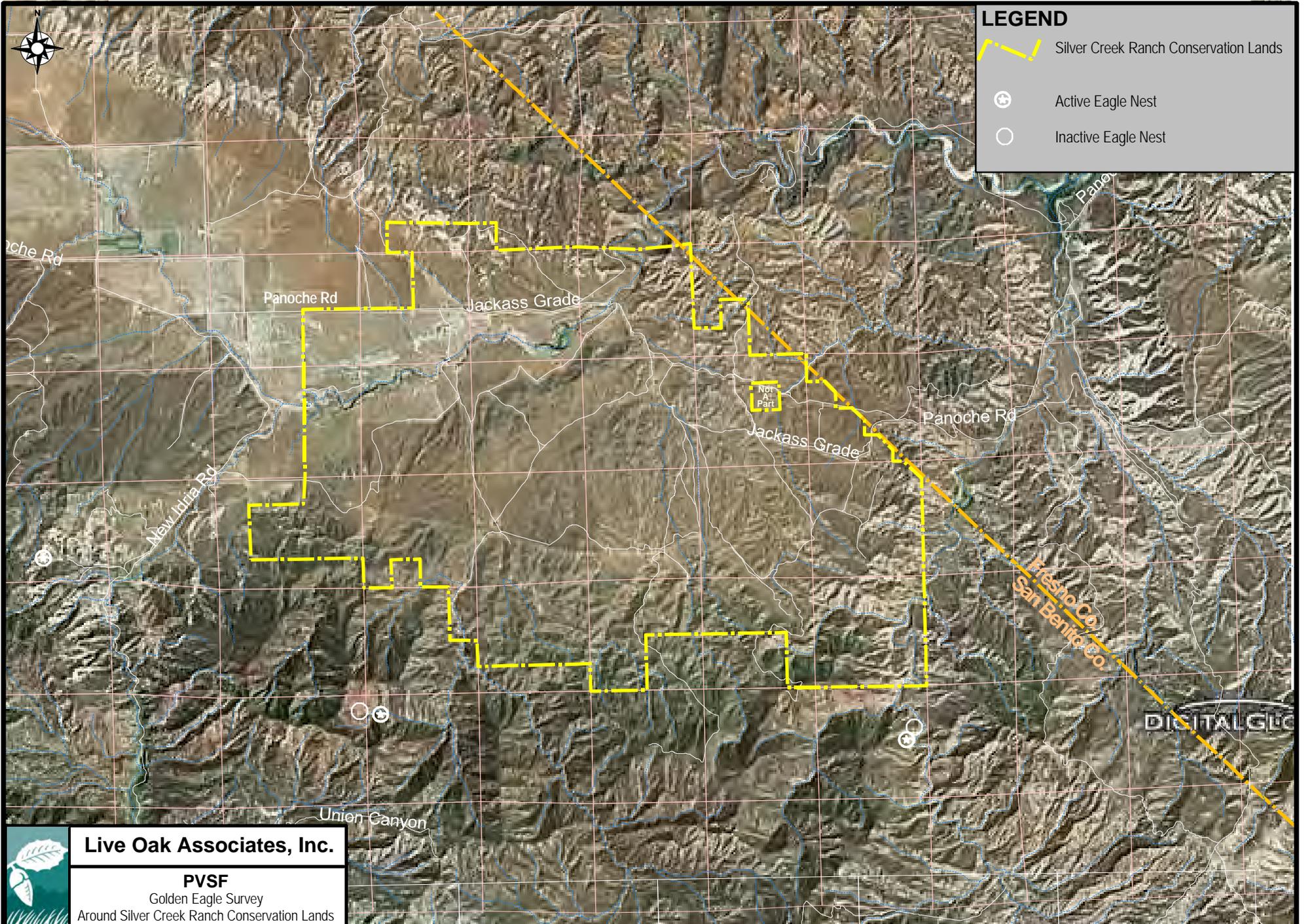
The Silver Creek Ranch is entirely within the area surveyed for golden eagles. The entire survey identified a total of 15 golden eagle nests; nine active and six inactive nests. No golden eagle nests were observed on the Silver Creek Ranch Conservation Lands, however, five were observed nearby to the south of the Silver Creek Ranch Conservation Lands. Three of these nests were active and two were inactive during the 2010 survey (Figure I-8). Additionally, nests of barn owls, great horned owls, prairie falcons, red-tailed hawks, and turkey vultures were identified. None of these nests were on the Silver Creek Ranch Conservation Lands; however, many were in the nearby hills. Given the proximity of the golden eagle nests, golden eagles and other raptors are likely to use the entire site for foraging habitat; although no golden eagle nests were identified on the Silver Creek Ranch during these surveys, marginal nesting habitat exists on the Ranch in the form of rock crevices and trees along the Panoche and Silver Creeks.

DRAFT



LEGEND

-  Silver Creek Ranch Conservation Lands
-  Active Eagle Nest
-  Inactive Eagle Nest



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Golden Eagle Survey

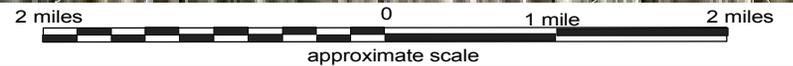
Around Silver Creek Ranch Conservation Lands

Date
11/14/2012

Project #
1534-04

Figure #
I - 8

Aerial photo courtesy of Digital Globe



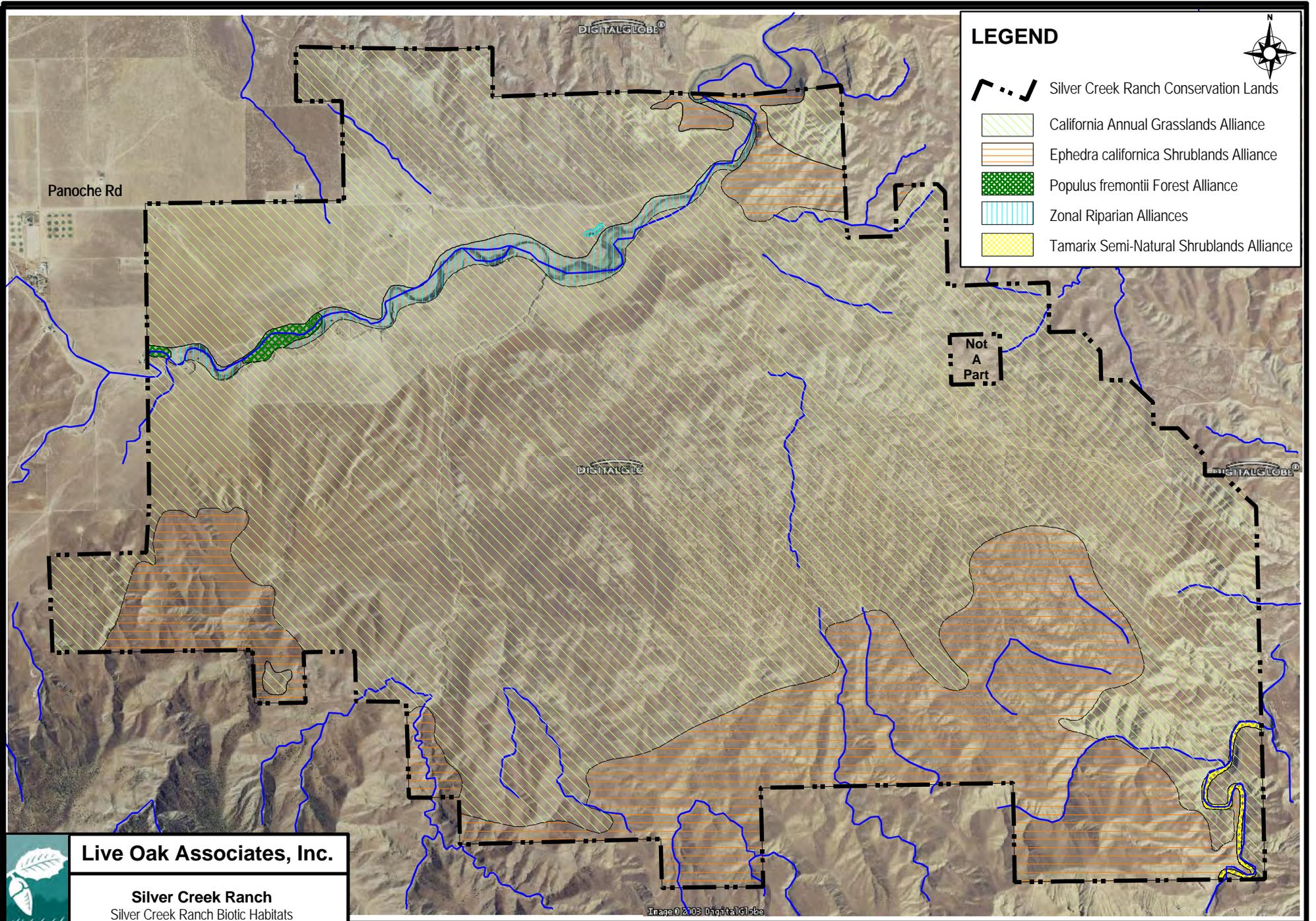
Habitat Mapping of the Silver Creek Ranch Conservation Lands

Live Oak Associates (LOA) botanists surveyed the Silver Creek Ranch Conservation Lands from September 3 through September 5, 2010 to create a general habitat map to be used to better understand the biotic conditions on the Ranch. Elevations on the Silver Creek Ranch range from 900 to 2,200 feet above mean sea level (amsl). California annual grasslands comprise the majority of ground cover on the site (approximately 8,400 acres) and are dominated by non-native species distributed sparsely over the landscape; the site also supports ephedra shrubland (approximately 2,260 acres), riparian areas, seeps, springs, and barrens (see Figure I-9). An area of tamarisk shrubland occurs along Silver Creek, and small areas of emergent wetlands and marsh occur along Panoche Creek. These lands also include several seasonal drainages and upland habitat. Soils on the Silver Creek Ranch are less complex than those found on the Valadeao Ranch and are generally characterized as well drained and moderately permeable. Two populations of *Eriogonum nudum* var. *indictum* (California Native Plant Society [CNPS] List 4) were also observed during the reconnaissance surveys. This habitat mapping effort provides a general characterization of habitats of the Silver Creek Ranch, which was further used to assess the Ranch for possible presence of special status species.

Reconnaissance Surveys on the Silver Creek Ranch Conservation Lands

LOA biologists surveyed Silver Creek Ranch August 30 through September 3, 2010. Reconnaissance level surveys of the entire property confirmed the presence of BNLL (four individual juveniles), loggerhead shrike (individuals), mastiff bat (*Eumops perotis*) (at least one individual), GKR (precincts and scat), SJKF (burrows, scat, and five individuals identified during one night of spotlighting), SJAS (dozens of individuals and scat), and American badger (burrows). All Covered Species except CTS or evidence of them were observed by LOA on these lands during the reconnaissance survey in late August-early September of 2010, however, the survey time was short and in the wrong season to appropriately survey for CTS.

These surveys confirmed the value of the Silver Creek Ranch as stated in the Recovery Plan (USFWS 1998), however, additional surveys were required to collect quantitative information to inform a detailed conservation strategy, therefore, focused surveys were conducted for the BNLL, GKR, and SJKF in 2012. Section 3 provides a summary of the 2012 focused surveys at the Silver Creek Ranch.



LEGEND

-  Silver Creek Ranch Conservation Lands
-  California Annual Grasslands Alliance
-  Ephedra californica Shrublands Alliance
-  Populus fremontii Forest Alliance
-  Zonal Riparian Alliances
-  Tamarix Semi-Natural Shrublands Alliance



Panoche Rd

Not
A
Part

 **Live Oak Associates, Inc.**

Silver Creek Ranch
Silver Creek Ranch Biotic Habitats

Date	Project #	Figure #
11/14/2012	1534-04	I-9



Aerial photo courtesy of Digital Globe

3 SILVER CREEK RANCH 2012 FOCUSED SURVEYS

Although BNLL, GKR, and SJKF presence was confirmed by LOA during 2010, in order to collect quantitative information to inform a detailed conservation strategy, focused surveys were conducted for the BNLL, GKR, and SJKF in 2012. Table I-2 lists focused surveys conducted on the Silver Creek Ranch in 2012, and each is discussed in detail in the following text. Although not a focused survey, a hydrology and CTS reconnaissance survey was conducted on the Silver Creek Ranch Conservation Lands on June 28, 2012 in order to identify potential locations to construct new CTS ponds.

Training was conducted prior to the BNLL and GKR focused surveys to (re)familiarize each of the nine biologists (three teams of three) with the identification of the species that occur or may occur on the Silver Creek Ranch (side-blotched lizard, western fence lizard, whiptail lizard, coast horned lizard, BNLL, Heermann's kangaroo rat, GKR, SJAS, California ground squirrel, and SJKF). When new biologists started on the team they were also trained. These trainings ensured that all biologists calibrated their search image to a consistent search image and thus reduced bias. Conversations and retrainings also recalibrated this search image throughout the two weeks. Teams included biologists from LOA, Rincon Consultants, Inc., and McCormick Biological, Inc.

TABLE I-2. SURVEYS CONDUCTED ON THE SILVER CREEK RANCH CONSERVATION LANDS IN 2012

SURVEY NAME	SURVEY DESCRIPTION	DATES	LANDS SURVEYED	SPECIAL STATUS ANIMAL SPECIES DETECTED
Hydrology and CTS Reconnaissance Survey	Identify locations to construct new CTS ponds.	June 28, 2012	Valadeao Ranch and Silver Creek Ranch Conservation Lands (CL)	GKR, SJKF
Blunt-nosed Leopard Lizard Focused Survey (2012)	Focused BNLL surveys on the 10,889-acre Silver Creek Ranch, following time of day and weather protocols, targeting drainages.	Summer 2012 (September 10-17, 2012)	Silver Creek Ranch CL	BNLL, GKR, SJAS, SJKF, Amercian badger, golden eagle, western burrowing owl, western pond turtle
Giant Kangaroo Rat focused surveys	GKR focused surveys (100 50-meter radius plots) on the Silver Creek Ranch in source population polygons identified in Figure 41 of the Recovery Plan (USFWS 1998).	Summer 2012 (September 10-21, 2012)	Silver Creek Ranch CL	GKR, SJKF, SJAS, BNLL, golden eagle, Amercian badger
Spotlighting for San Joaquin Kit Fox	Spotlighting on the 10,889-acre Silver Creek Ranch and public roads in the vicinity surrounding the ranch.	Summer/Fall 2012 (September 23-November 2, 2012)	Silver Creek Ranch CL	SJKF, Amercian badger, GKR, western burrowing owl,
Camera Trapping for San Joaquin Kit Fox	Camera Trapping (with bait) on the 10,889-acre Silver Creek Ranch. 20 camera trap locations.	Summer/Fall 2012 (September 25-November 2, 2012)	Silver Creek Ranch CL	SJKF, Amercian badger, GKR, western burrowing owl, tricolored blackbird

3.1 BLUNT-NOSED LEOPARD LIZARD

3.1.1 Survey Protocol

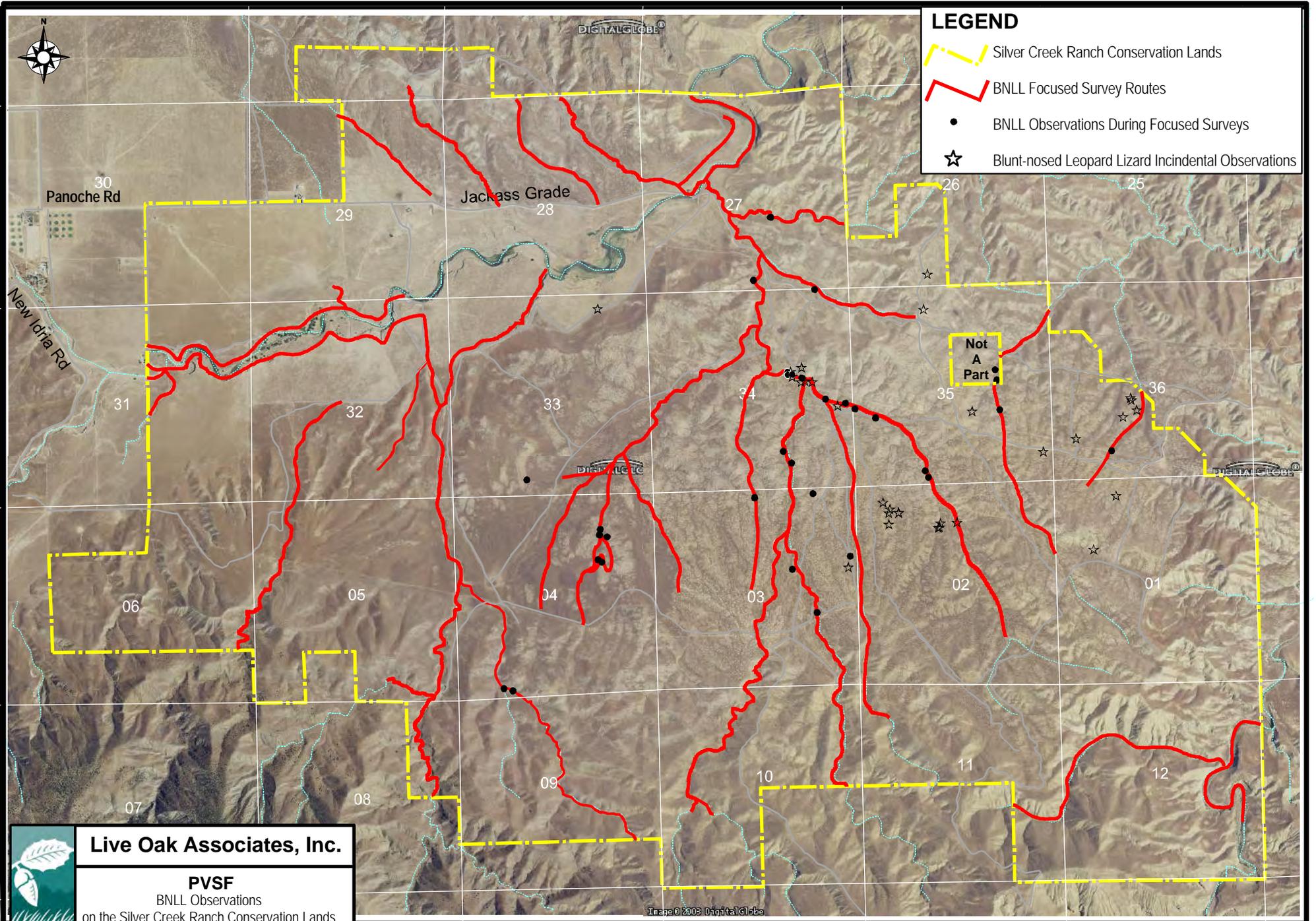
Focused BNLL surveys were conducted on the Silver Creek Ranch Conservation Lands in September of 2012. These focused surveys were organized in the field by Dr. Mark Jennings, an expert herpetologist. As abridged protocol-level surveys in 2009 and full protocol-level surveys in 2010 of the Valley Floor Conservation Lands located all observations of BNLL in or near the washes, targeted habitat areas for the focused surveys on the Silver Creek Ranch Conservation Lands were the drainages of the ranch. Figures I-10 and I-11 show focused survey routes and species detections during these surveys.

BNLL focused surveys were conducted from September 10th through September 17th, 2012. Each team of three biologists surveyed drainages, with one biologist walking in the drainage and two biologists on either side. Focused BNLL surveys were conducted according to specifications within the BNLL survey protocol except that drainages were targeted and surveys were conducted on September 17th (two days past the protocol dates). However, Dr. Jennings determined that the weather was still warm enough to continue with surveys, as evidenced by incidental BNLL sightings through September 21st, 2012.

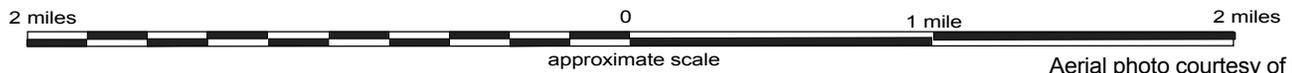


LEGEND

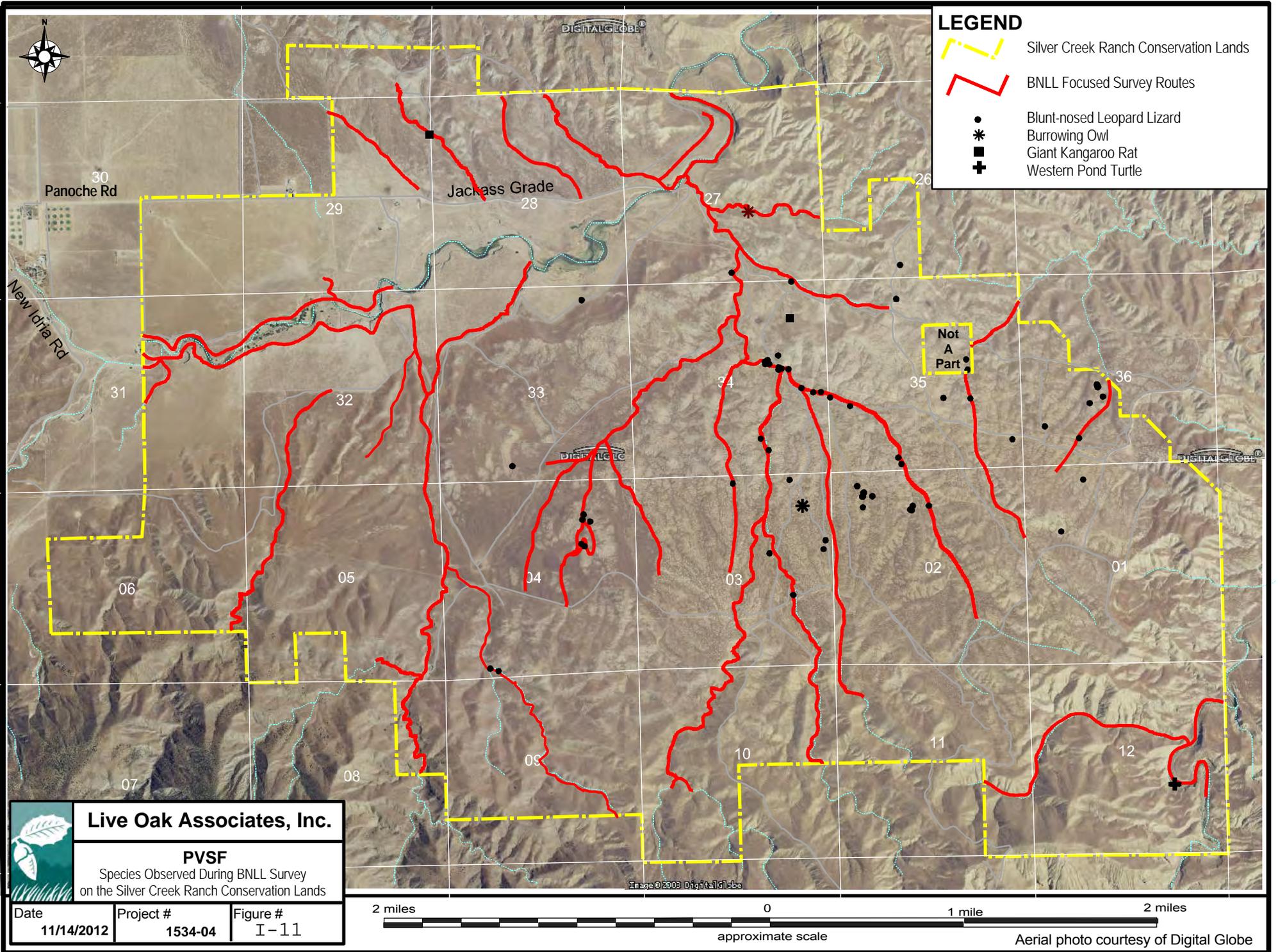
-  Silver Creek Ranch Conservation Lands
-  BNLL Focused Survey Routes
-  BNLL Observations During Focused Surveys
-  Blunt-nosed Leopard Lizard Incidental Observations



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BNLL Observations on the Silver Creek Ranch Conservation Lands		
Date	Project #	Figure #
11/14/2012	1534-04	I-10



Aerial photo courtesy of Digital Globe



LEGEND

- — — Silver Creek Ranch Conservation Lands
- — — BNLL Focused Survey Routes
- Blunt-nosed Leopard Lizard
- * Burrowing Owl
- Giant Kangaroo Rat
- ⊕ Western Pond Turtle

	Live Oak Associates, Inc.	
	PVSF Species Observed During BNLL Survey on the Silver Creek Ranch Conservation Lands	
Date	Project #	Figure #
11/14/2012	1534-04	I-11

2 miles 0 1 mile 2 miles
 approximate scale

Aerial photo courtesy of Digital Globe

3.1.2 Blunt-nosed Leopard Lizard Survey Results

Focused BNLL surveys confirmed presence of BNLL, western pond turtle, golden eagle, western burrowing owl, GKR, SJAS, SJKF and American badger on the Silver Creek Ranch Conservation Lands. Thirty-one (31) BNLL were observed during focused surveys for BNLL and there were 30 incidental BNLL detections during GKR focused surveys. BNLL were incidentally observed during GKR focused surveys from September 11th through September 21st, 2012. The majority of these incidental observations were not associated with a drainage. A total of 61 BNLL detections occurred in a two-week period (Figures I-10 and I-11). All BNLL observed were juveniles except for two subadults. It is important to note that during BNLL focused surveys, juvenile BNLL were observed within drainages, on hill slopes, and even on top of rocks on ridge tops.

3.1.3 Determination of Blunt-nosed Leopard Lizard Estimates and Methodology

Habitat Acreage Estimate for the Silver Creek Ranch

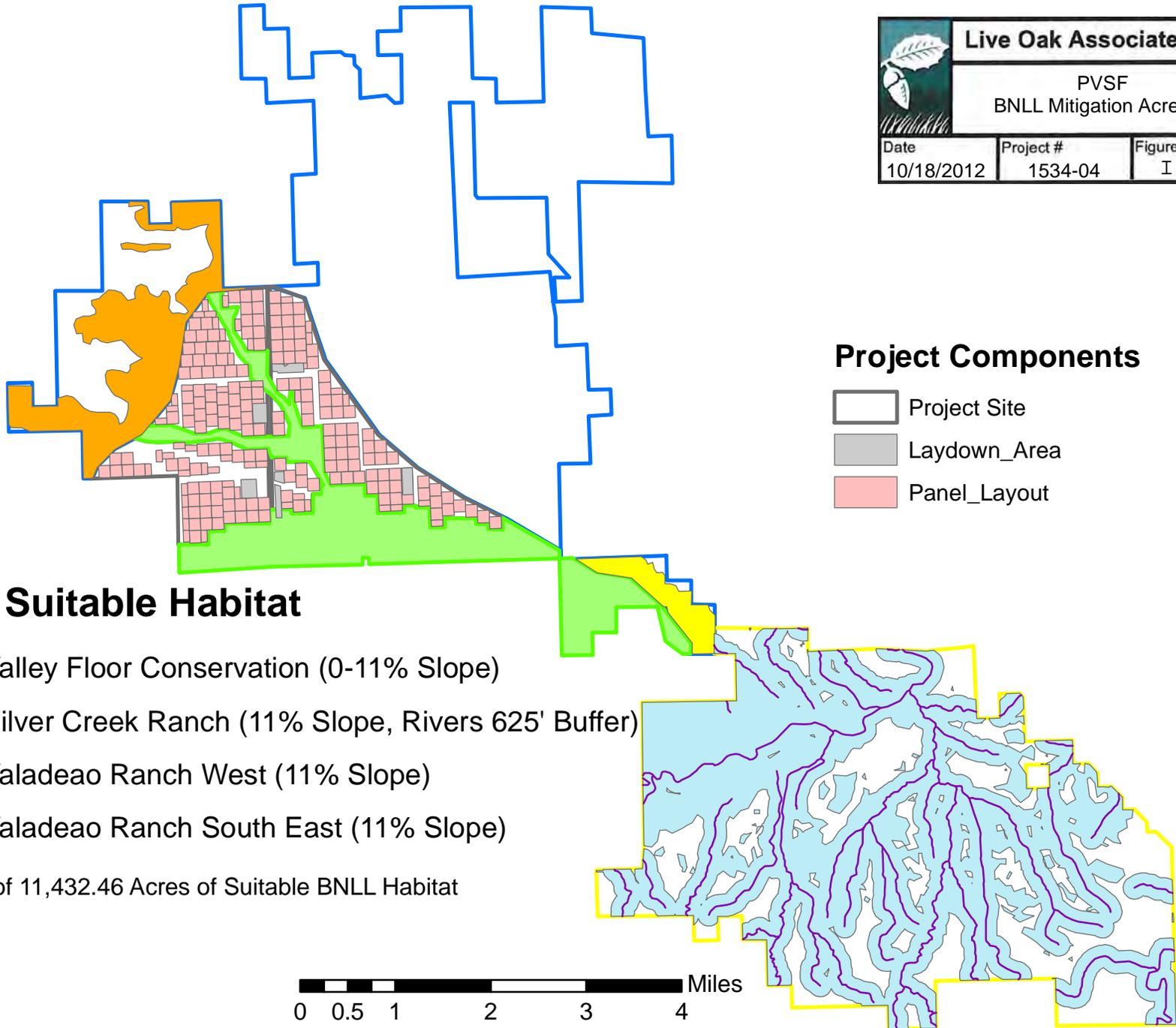
To determine the suitable habitat acreage for BNLL on the Silver Creek Ranch Conservation Lands, two decision rules were used together. First, a slope analysis was performed, and considering all of the Project site known to support BNLL is between 0 and 11 percent slope, it was determined that all areas within the same slope range supporting appropriate habitat (i.e., sparse vegetation, friable soils and small mammal burrows) were considered suitable habitat for the species. The second decision rule was to use a 625-foot buffer around the “rivers” GIS layer. The rivers layer was used due to the fact BNLL were found closely associated to this type of habitat on the Project site; and 625 feet was the average distance from the center of Panoche Creek that juvenile BNLL were observed during surveys conducted by LOA in 2009 and 2010. This buffer connects most of the polygons and serves as a viable connection between 11 percent slopes as suitable habitat or corridors. All observations of individual BNLLs on the Silver Creek Ranch were within these areas; had any observations occurred outside these areas, they would have been factored in. At least 7,875 acres of suitable habitat for BNLL exists on the Silver Creek Ranch (Figure I-12).

Population Estimate on the Silver Creek Ranch

The focused BNLL and GKR surveys conducted in 2012 located 61 detections of BNLL. As all BNLL observed were juveniles (except two subadults), and surveys were conducted late in the juvenile season when adult BNLL are underground where they are not observable during surface surveys, more than 61 BNLL are expected to use the Silver Creek Ranch (Table I-3).



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	PVSF BNLL Mitigation Acreage	
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Project Components

- Project Site
- Laydown_Area
- Panel_Layout

BNLL Suitable Habitat

- 2072 Valley Floor Conservation (0-11% Slope)
- 7875.36 Silver Creek Ranch (11% Slope, Rivers 625' Buffer)
- 1214.71 Valadeao Ranch West (11% Slope)
- 270.39 Valadeao Ranch South East (11% Slope)

Total of 11,432.46 Acres of Suitable BNLL Habitat

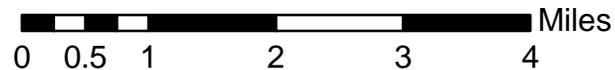


TABLE I-3. INDIVIDUALS IMPACTED AND POPULATION ESTIMATES FOR SPECIAL STATUS SPECIES ON CONSERVATION LANDS

SPECIES	ESTIMATE OF INDIVIDUALS #			ACRES OF HABITAT		
	IMPACTED BY THE PROJECT	SILVER CREEK RANCH CL	ACRES IMPACTED	MITIGATION ACRES REQUIRED	MITIGATION ACRES ON CL	ADDITIONAL MITIGATION
BNLL	Up to 6	61+	2,813	7,829	11,432	Conservation Management Plan
GKR	Up to 799	Up to 44,871 individuals	2,813	7,829	16,125	Conservation Management Plan
SJKF	9 onsite and 2 affected by vehicle-strike	30+ individuals	2,813	9,422	14,603	Conservation Management Plan

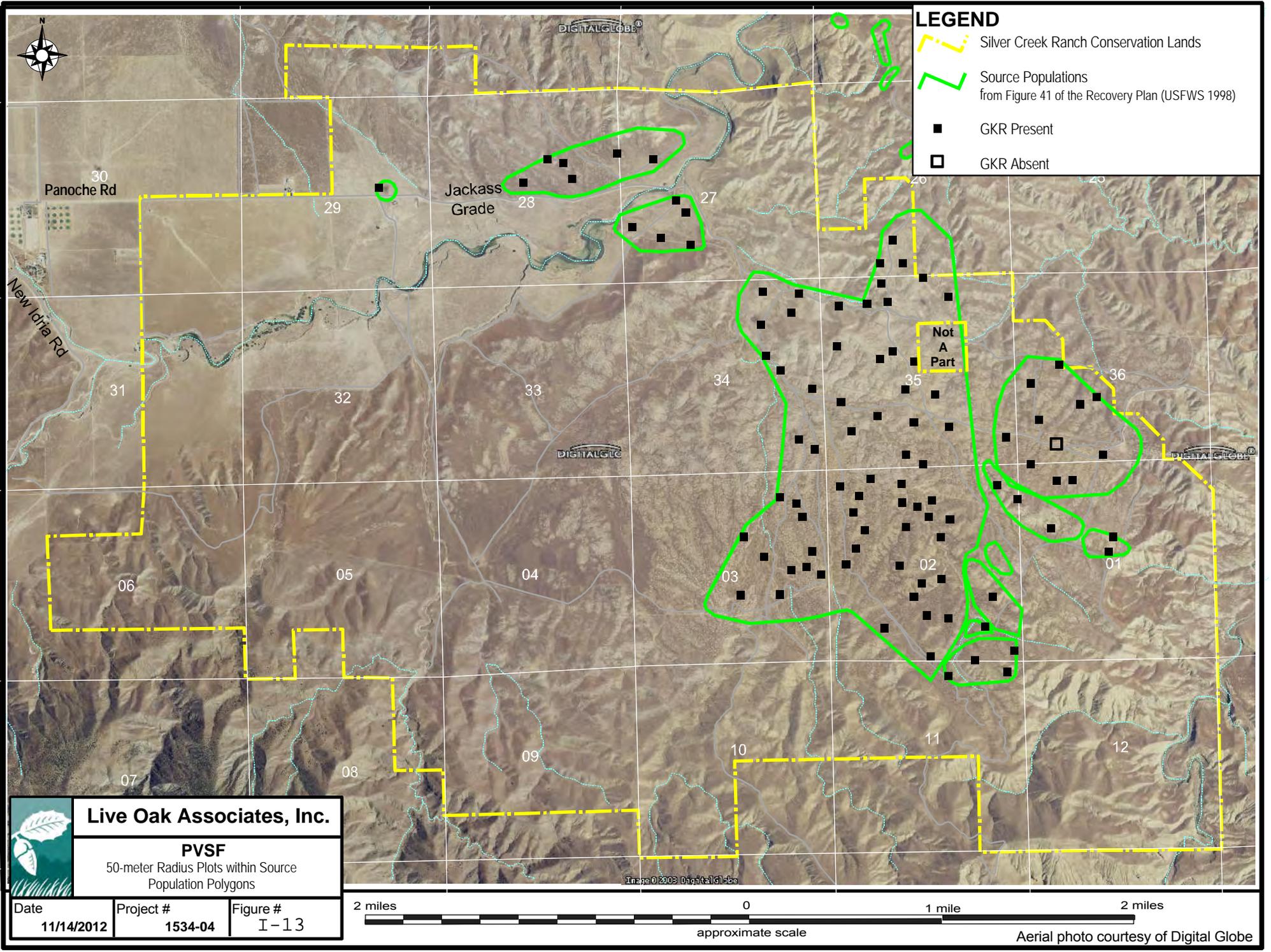
3.2 GIANT KANGAROO RAT FOCUSED SURVEYS

3.2.1 Survey Protocol

Focused GKR surveys were conducted within the source populations identified in Figure 41 of the Recovery Plan (USFWS 1998) in September of 2012. The source populations were originally mapped by Williams et al. (1995). One hundred 50-meter radius plots were surveyed for GKR and active precincts on the Silver Creek Ranch. GKR presence was verified by the presence of suitable scat (larger than seven millimeters [mm]) and footprints (larger than 47 mm), and further identified (e.g., confirmed) by the presence of surface pit caches, and size and type of burrow entrances (e.g., vertical and horizontal shafts). Active precincts were identified by the presence of scat, footprints, tail drags and surface pit caches. Two random plot centers were moved in the field due to one of them being in a dangerous curve of a road, and one of them partially including a house. These two points were moved just enough to avoid those obstacles.

3.2.2 Giant Kangaroo Rat Survey Results

Ninety-nine of the 100 plots surveyed supported GKR (see Figure I-13). Average density for these plots was 25.66 GKR precincts per plot (or 13.23 per acre). During GKR surveys, additional BNLL, golden eagle, SJAS, SJKF, and American badger observations were made. During the BNLL and GKR surveys (a two-week effort), 119 observations of SJAS were incidentally made on the Silver Creek Ranch Conservation Lands over two weeks during focused BNLL and GKR surveys.

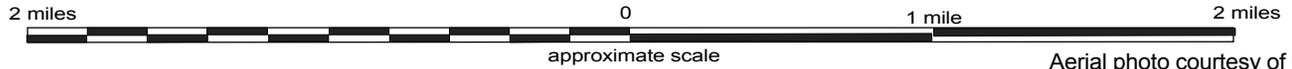


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50-meter Radius Plots within Source Population Polygons

Date	Project #	Figure #
11/14/2012	1534-04	I-13



Aerial photo courtesy of Digital Globe

3.2.3 Determination of Giant Kangaroo Rat Estimates and Methodology

Habitat Acreage Estimate for the Silver Creek Ranch

To determine the suitable habitat acreage for GKR on the Silver Creek Ranch, four decision rules were used together. First, a slope analysis was performed, and considering all of the Project site known to support GKR is between 0 and 11 percent slope, it was determined that all areas within the same slope range supporting appropriate habitat (i.e., annual grassland and friable soils) were considered highly suitable habitat for the species. Second, previously reported GKR locations from the CNDDDB were added as a GIS layer; third, observations made by LOA during reconnaissance surveys between late August and early September 2010 were added as a GIS layer; and fourth, the area up to the first flood terrace of Panoche Creek was removed; GKR are not expected to use this area, as it would be low-suitable habitat. These layers were combined to derive a habitat suitability map for GKR on the SCR resulting in approximately 7,223 acres of suitable habitat (Figure I-14).

Population Estimate for the Silver Creek Ranch

As population densities of GKR on the Silver Creek Ranch within the source population polygons are high and the suitable habitat of Silver Creek Ranch outside of these polygons is moderate (as shown by the 2012 surveys), the average density for GKR plots on the Silver Creek Ranch was used for the source population areas. That density estimate was reduced (proportionally to reductions on the Project site and Valley Floor Conservation Lands from high to moderate) to an estimate of 2.63 GKR per acre for the suitable habitat outside of the source populations. These density estimates were used to estimate a population of up to 44,871 individual GKR (see Tables I-3 and I-4).



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GKR Mitigation Acreage

Date	Project #	Figure #
10/18/2012	1534-04	I-14

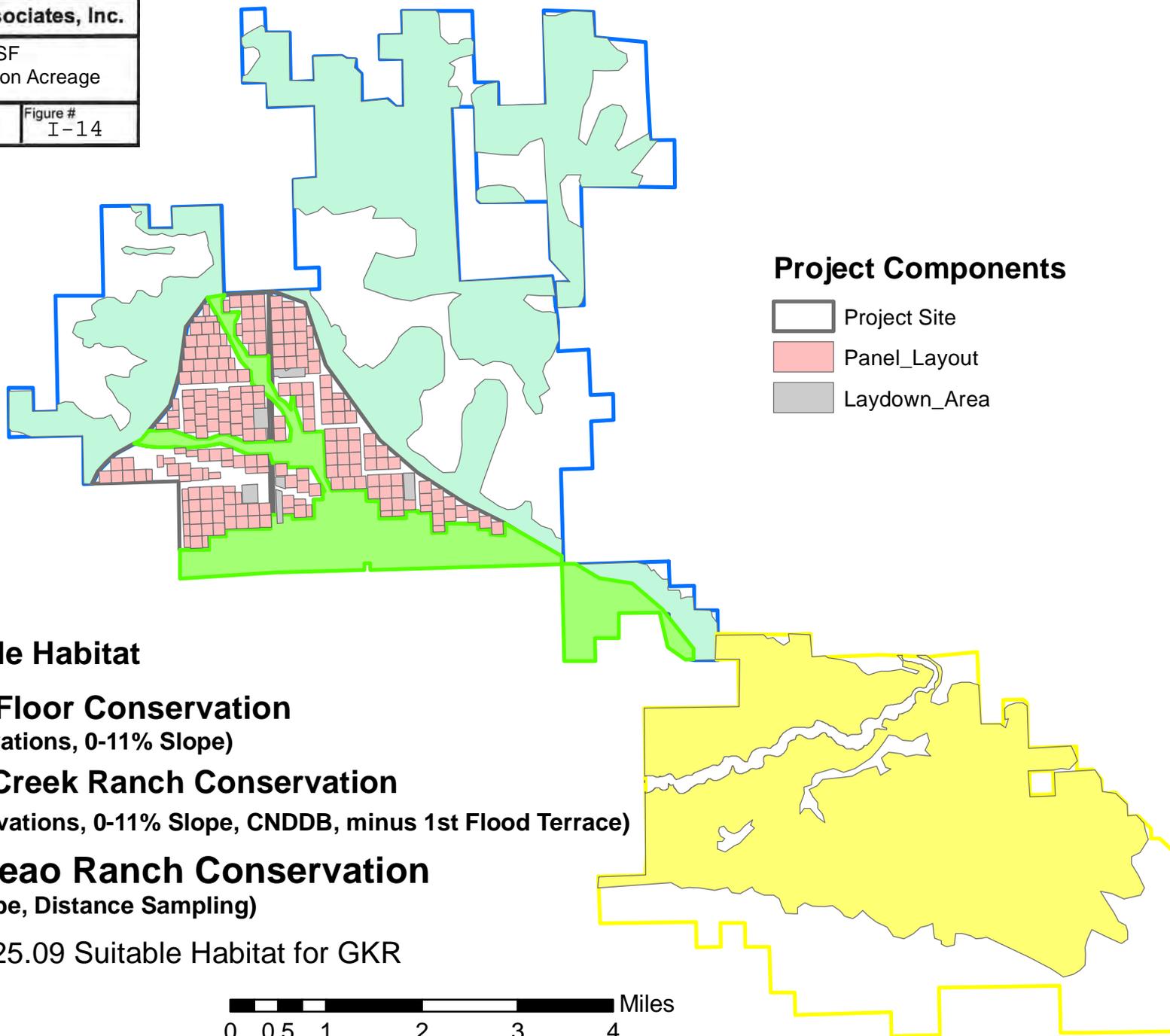


TABLE I-4. ESTIMATED GKR DENSITIES ON THE SILVER CREEK CONSERVATION LANDS

MITIGATION SITE	AVERAGE DENSITY OF GKR (GKR/ACRE)	CL TOTAL (ACRES)	CL ADJUSTED (ACRES)	CONSERVATION OF INDIVIDUALS	SOURCE FOR DENSITY ESTIMATES
Silver Creek Ranch CL† (High Suitability)	13.23	10,889	2,441	32,294	Average density of GKR precincts for 100 50-meter plots focused in source population polygons identified in the Recovery Plan (USFWS 1998) on the Silver Creek Ranch CL
Silver Creek Ranch CL† (Moderate Suitability)	2.63	10,889	4,782.3	12,577	Average density of GKR precincts for 100 50-meter plots focused in source population polygons identified in the Recovery Plan (USFWS 1998) on the Silver Creek Ranch CL reduced proportional to reductions in estimates on the Project site and Valley Floor CLs.
Silver Creek Ranch CL (Total)		10,889	7,223.3	44,871	The total of the two rows above.

†Based on empirical data collected in 2012 on the Silver Creek Ranch Conservation Lands within source population polygons previously defined and previously identified in Figure 41 of the Recovery Plan (USFWS 1998).

3.3 SAN JOAQUIN KIT FOX FOCUSED SURVEYS

3.3.1 Survey Protocol

Spotlighting Surveys

For consistency, two LOA biologists, Ms. Krakow and Dr. Townsend, conducted the spotlight surveys throughout; Ms. Krakow did not survey for four nights and Dr. Townsend did not survey for two separate nights; three other LOA biologists substituted for spotlighting on those nights. Having at least one of the two main biologists spotlighting on all nights maintained consistency of observations, identifications, and also ensured that someone with knowledge of the site (at night) was one of the surveyors. Portions of the public roads were surveyed on both routes, and that a portion or all of each survey route on the Silver Creek Ranch Conservation Lands was surveyed each night. Approximately 20 miles were spotlighted each night.

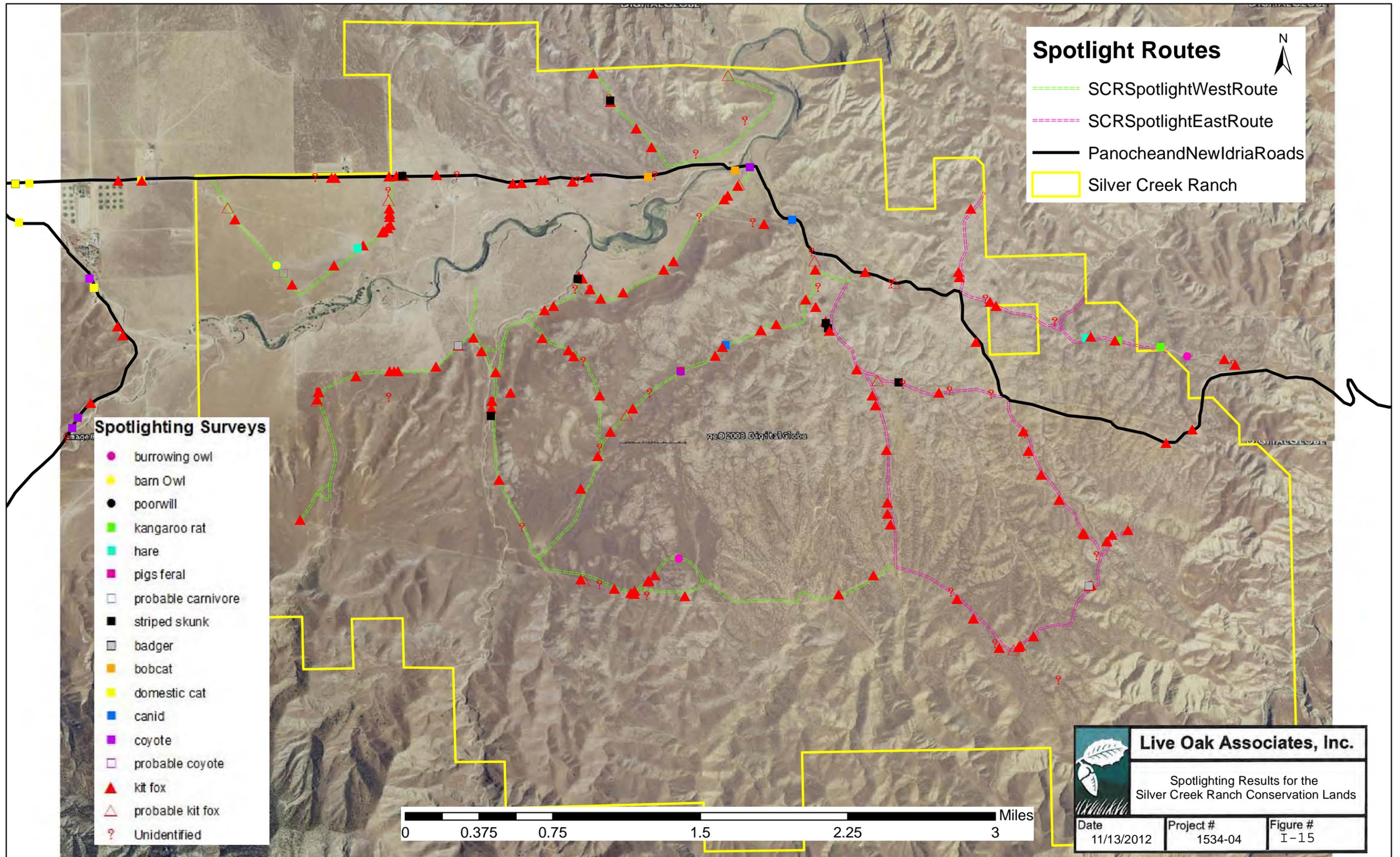
Spotlighting surveys were conducted on 20.5 nights (the half a night was due to vehicle trouble, and thus, an additional full night was spotlighted to compensate for this) surveying approximately 20 miles of public and ranch roads per night. Spotlighting was conducted on 10 nights on the eastern half of the ranch and 10.5 nights on the western half of the ranch.

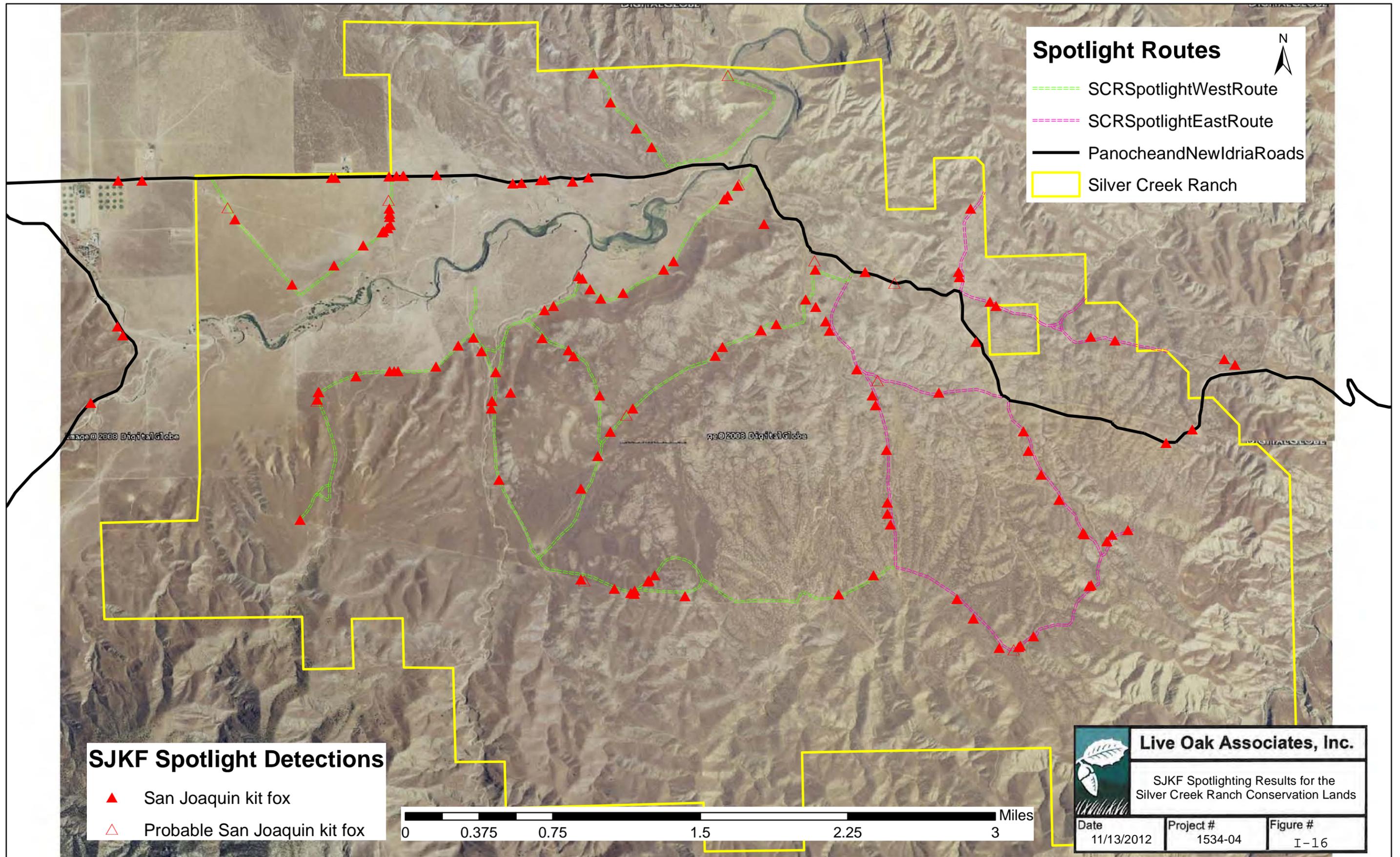
Camera Trap Station Surveys

A total of 20 camera trap stations were set up on the Silver Creek Ranch. Ten camera trap stations were set up on the western half of the Silver Creek Ranch Conservation Lands, and ten camera trap stations were set up on the eastern half. Camera trap stations were set up on the opposite side of the ranch from spotlighting activities, and in areas that would not be visible during spotlighting activities. All camera traps were placed at least a half mile from each other as to ensure they were spread out far enough. 2012 model Bushnell Trophy Cam HD cameras (Overland Park, Kansas) were used; cameras were set to take three photos for each event with a five second interval, with settings of high sensitivity and low LED. Cameras were baited with canned cat food, which was re-baited at least once during the surveys. Each set of 10 camera trap stations were functional for at least 10 trap nights.

3.3.2 San Joaquin Kit Fox Survey Results

Spotlighting and camera station surveys of the Silver Creek Ranch Conservation Lands identified multiple SJKF. Figures I-15 and I-16 show spotlighting routes, overall results, and SJKF locations; Figure I-17 shows locations of camera trap stations where SJKF were observed.





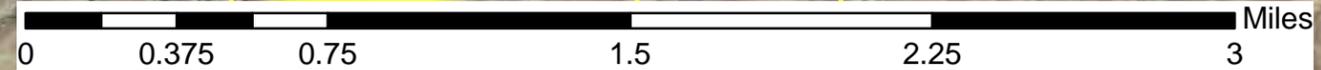
Spotlight Routes

- SCRSpotlightWestRoute
- SCRSpotlightEastRoute
- PanocheandNewIdriaRoads
- Silver Creek Ranch

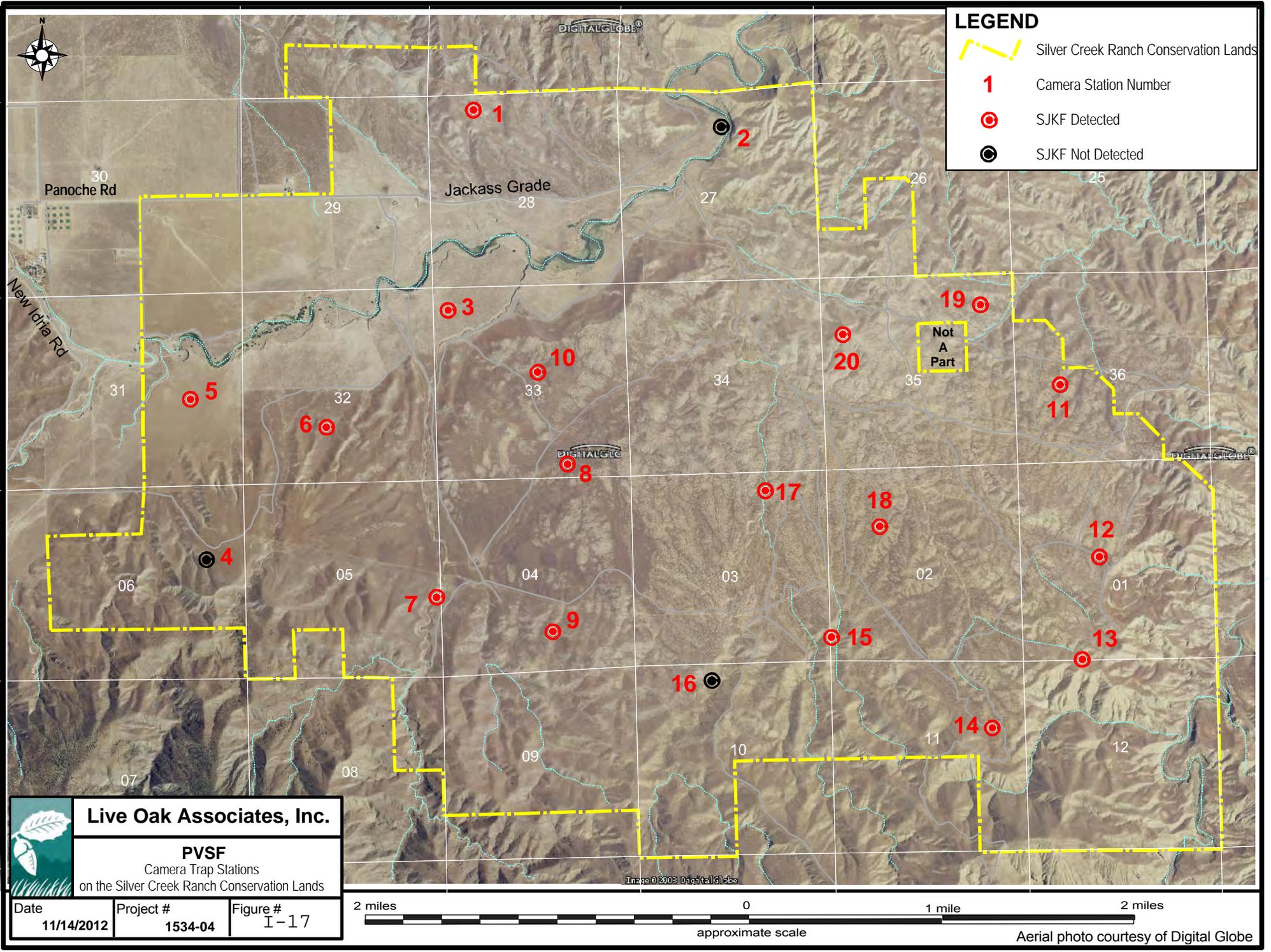


SJKF Spotlight Detections

- ▲ San Joaquin kit fox
- △ Probable San Joaquin kit fox



 Live Oak Associates, Inc.		
SJKF Spotlighting Results for the Silver Creek Ranch Conservation Lands		
Date	Project #	Figure #
11/13/2012	1534-04	I-16



Spotlighting Surveys

A range of two to 10 SJKF were observed in one night (Table I-5). Spotlighting resulted in 137 SJKF detections and 11 detections classified as probably SJKF. Spotlighting on the eastern half of the Ranch observed 62 detections of SJKF (14 of which were juveniles) and three detections classified as probable SJKF. The western half of the Ranch observed 75 detections of SJKF (two of which were juveniles) and eight detections classified as probable SJKF. It is important to note that kit foxes were detected within drainages, on flat land, on hill slopes, and even on ridges of hills; the SJKF observed on the Silver Creek Ranch Conservation Lands appear to use hills with much steeper slopes than previous literature suggests, which agrees with the results of the scat-sniffing dog surveys on the Valadeao Ranch Conservation Lands, which also show SJKF using slopes steeper than previously described in literature.

Other species observed during spotlight surveys include the western burrowing owl, great horned owl, short-eared owl, barn owl, common poorwill, kangaroo rat, jack rabbit, desert cottontail, striped skunk, American badger, domestic cat, bobcat, coyote, and feral pig.

Notable Spotlighting Observations

1. On a few occasions, multiple SJKF were observed together.
2. Only one uniquely identifiable SJKF was observed during spotlight surveys; it only had one eye.
3. A young American badger and a young SJKF appeared to be traveling together on two separate dates of spotlighting on opposite sides of the Silver Creek Ranch Conservation Lands.

TABLE I-5. SAN JOAQUIN KIT FOX SPOTLIGHTING DETECTIONS

Day	Date	# Total SJKF	# Juveniles	Additional probable kit fox
West 1	23-Sep-12	9	4	0
West 2	24-Sep-12	7	2	0
West 3	25-Sep-12	2	0	0
West 4	26-Sep-12	4	1	1
West 5	27-Sep-12	10	3	0
West 6	30-Sep-12	7	1	2
West 7	1-Oct-12	3	0	0
West 8	2-Oct-12	7	0	0
West 9	3-Oct-12	3	1	0
West 10	4-Oct-12	10	2	0
East 1	13-Oct-12	6	0	1
East 2	14-Oct-12	10	0	2

Day	Date	# Total SJKF	# Juveniles	Additional probable kit fox
East 3	22-Oct-12	6	1	2
East 4a	23-Oct-12	2	0	0
East 4b	24-Oct-12	8	0	1
East 5	25-Oct-12	10	0	0
East 6	26-Oct-12	9	0	1
East 7	27-Oct-12	4	1	1
East 8	31-Oct-12	7	0	0
East 9	1-Nov-12	3	0	0
East 10	2-Nov-12	10	0	0
Total		137	16	11
Total West		62	14	3
Total East		75	2	8
*East 4a was only a couple hours of spotlighting, as vehicle trouble occurred; East 4b was a full night of spotlighting to compensate for East 4a.				

Camera Trap Station Surveys

Ten camera trap stations were set up on the western half of the Silver Creek Ranch Conservation Lands, which recorded SJKF at eight of the 10 stations, and ten camera trap stations were set up on the eastern half, which recorded SJKF at nine of the 10 stations. Seventeen out of 20 camera trap stations detected SJKF on 119 of 275 trap nights, resulting in approximately 43 percent detection. Individual camera trap detections of SJKF ranged from 0 percent to almost 91 percent detection (Figure I-17, Tables I-6 and I-7). Tables I-6 and I-7 illustrate species detected in relation to camera trap nights.

It is important to note that camera station #9 was knocked over by a cow and the batteries came loose, resulting in a reduction of trap nights for that camera. A few other cameras also got knocked over by cows, but continued to detect species through the duration of their trap nights. As SJKF rarely have unique identifying features, individuals are difficult to distinguish. Therefore, it should be assumed that a minimum of one SJKF visited each camera station where SJKF was detected; however, it is likely that many of the camera stations were visited by multiple SJKF.

TABLE I-6. TRAP NIGHTS SPECIES DETECTED PER CAMERA STATION (WESTERN HALF OF THE SILVER CREEK RANCH CONSERVATION LANDS)

SPECIES	# TRAP NIGHTS SPECIES DETECTED PER CAMERA STATION										TOTAL # STATIONS SPECIES DETECTED (OUT OF 10)	TOTAL CAMERA-TRAP NIGHTS DETECTED	TOTAL CAMERA-TRAP NIGHTS	TOTAL PERCENT TRAP NIGHTS SPECIES DETECTED
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10				
SJKF	8	0	4	0	7	8	9	6	7	9	8	58	170	34.12
Coyote	2	3	1	0	1	1	0	0	0	3	6	11	170	6.47
Bobcat	0	1	0	0	0	0	0	0	0	0	1	1	170	0.59
Striped Skunk	2	1	0	0	0	0	5	2	3	3	6	16	170	9.41
American Badger	0	0	0	0	0	0	0	1	0	1	2	2	170	1.18
Kangaroo Rat	1	1	0	0	0	4	2	0	2	1	6	11	170	6.47
Unidentified Small Mammal	0	0	0	1	0	0	0	0	0	0	1	1	170	0.59
Jack Rabbit	0	4	0	3	4	0	0	0	0	0	3	11	170	6.47
Cottontail	0	0	0	4	0	0	0	0	0	0	1	4	170	2.35
Cattle	14	2	5	0	0	3	0	0	4	0	5	28	170	16.47
Boar	0	0	0	0	0	2	0	1	0	0	2	3	170	1.76
Great-horned Owl	0	0	0	0	0	0	0	1	0	0	1	1	170	0.59
Burrowing Owl	0	0	0	0	0	0	0	0	1	0	1	1	170	0.59
Raven	0	0	1	0	2	0	0	1	0	0	3	4	170	2.35
Roadrunner	0	2	0	1	0	0	0	0	0	0	2	3	170	1.76
Tricolored Blackbird	0	0	1	0	0	0	0	0	0	0	1	1	170	0.59
Brown-headed Cowbird	0	0	1	0	0	0	0	0	0	0	1	1	170	0.59
Say's Phoebe	0	0	0	0	0	0	1	0	0	0	1	1	170	0.59
Lark Sparrow	0	0	0	0	0	0	0	0	1	0	1	1	170	0.59
Total Camera-trap Nights	18	18	18	18	18	18	17	17	11	17				

TABLE I-7. PERCENT TRAP NIGHTS SPECIES DETECTED PER CAMERA STATION (WESTERN HALF OF THE SILVER CREEK RANCH CONSERVATION LANDS)

SPECIES	PERCENT TRAP NIGHTS DETECTED PER CAMERA STATION										TOTAL PERCENT TRAP NIGHTS SPECIES DETECTED
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	
SJKF	44.44	0.00	22.22	0.00	38.89	44.44	52.94	35.29	63.64	52.94	34.12
Coyote	11.11	16.67	5.56	0.00	5.56	5.56	0.00	0.00	0.00	17.65	6.47
Bobcat	0.00	5.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59
Striped Skunk	11.11	5.56	0.00	0.00	0.00	0.00	29.41	11.76	27.27	17.65	9.41
American Badger	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	5.88	1.18
Kangaroo Rat	5.56	5.56	0.00	0.00	0.00	22.22	11.76	0.00	18.18	5.88	6.47
Unidentified Small Mammal	0.00	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00	0.00	0.59
Jack Rabbit	0.00	22.22	0.00	16.67	22.22	0.00	0.00	0.00	0.00	0.00	6.47
Cottontail	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	2.35
Cattle	77.78	11.11	27.78	0.00	0.00	16.67	0.00	0.00	36.36	0.00	16.47
Boar	0.00	0.00	0.00	0.00	0.00	11.11	0.00	5.88	0.00	0.00	1.76
Great-horned Owl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.59
Burrowing Owl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.59
Raven	0.00	0.00	5.56	0.00	11.11	0.00	0.00	5.88	0.00	0.00	2.35
Roadrunner	0.00	11.11	0.00	5.56	0.00	0.00	0.00	0.00	0.00	0.00	1.76
Tricolored Blackbird	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59
Brown-headed Cowbird	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59
Say's Phoebe	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.59
Lark Sparrow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.59
Total Camera-trap Nights	18	18	18	18	18	18	17	17	11	17	

Notable Photo Captures



Figure I-18. Only one station (#6) detected two SJKF in the same photo, all other stations detected one individual at a time.



Figure I-19. San Joaquin kit foxes were observed visiting baited camera stations with dead kangaroo rats.



Figure I-20. One SJKF was observed bringing two dead kangaroo rats to a baited station.



Figure I-21. San Joaquin kit foxes were observed at bait stations with live kangaroo rats in close proximity.



Figure I-22. An American badger and a SJKF visited a bait station at camera station #9 within 31 seconds of each other; as SJKF and badger were observed twice traveling together during spotlighting surveys, this may be another example of the two species traveling together.

3.3.3 Determination of San Joaquin Kit Fox Estimates and Methodology

Habitat Acreage Estimate for the Silver Creek Ranch

To determine the suitable habitat acreage for SJKF on the Silver Creek Ranch, LOA extrapolated the information derived from the analysis on the Valadeao Ranch Conservation Lands, for which two decision rules were used together. First, a slope analysis was performed, and considering all of the Project site known to support SJKF is between 0 and 11 percent slope, it was determined that all areas within the same slope range supporting appropriate habitat (i.e., annual grassland and friable soils) were considered highly suitable habitat for the species. Second, LOA used results from the scat-sniffing dog surveys conducted in August and September 2010 on the Valadeao Ranch to further refine the 11 percent slope analysis. SJKF scat was located at slopes with a grade up to 35 percent; the breakdown is shown in Table I-8. Based on conversations with the resource agencies, species experts, and literature review, LOA prorated suitable habitat for SJKF on the Silver Creek Ranch Conservation Lands. Based on this formula, the Silver Creek Ranch Conservation Lands support a total of 7,412 acres of suitable habitat for SJKF (Figure I-23).

Population Estimate for the Silver Creek Ranch

Spotlighting surveys detected up to 10 SJKF on the eastern half of the Silver Creek Ranch, and up to 10 SJKF on the western half of the Silver Creek Ranch, and camera trap station surveys detected SJKF at 17 of the 20 camera trap stations. It is expected that some individuals were observed during multiple types of surveys (eastern spotlighting, western spotlighting, and/or camera trap stations), however, it is also expected that 100 percent of the SJKF population on the Silver Creek Ranch was not observed. Therefore, an estimated 30+ individuals are expected to use the Silver Creek Ranch (Table I-3).

TABLE I-8. MITIGATION AND IMPACT ASSESSMENT BREAKDOWN FOR THE SJKF AT THE PROJECT

IMPACTED LANDS (ACRES)	MITIGATION RATIO (X:1)	MITIGATION REQUIRED (ACRES)	SILVER CREEK RANCH (ACRES)	TOTAL CONSERVATION LANDS (ACRES)	DELTA ACRES
Species - Take Authorized					
Direct*	2,203.00	4	8,812.00		
50% of 4:1 Mit. on 0-5% Slopes			4,406.00	3,054.88	5,967.49
50% of 4:1 Mit. on 5.01-11% Slopes			4,406.00	2,709.75	4,813.70
Mit. On 11.01-21% Slopes			0.00	2,412.33	5,601.49
Mit. On 21.01-35% Slopes			0.00	1,765.93	5,115.73
Indirect**	610.00	1	610.00		
Mit. On 0-11% Slopes (Of Acreage After Direct Impacts Mitigated For)			610.00	1,969.19	1,359.19
Total	2,813.00				14,045.60

*For Direct Impacts: Slope acreage breakdown identified in the FEIR for the 4:1 mitigation ratio states that 50% of that ratio must include slopes of 5% or less and 50% must include slopes of 15% or less. Our acreage breakdown is 0-5% and 5.01-11%, a much more conservative breakdown, but still exceeds the required acreage for these two categories. Additionally, prorated values for slope categories of 11.01-21% and 21.01-35% are included, as empirical data collected on the Project Site, Valley Floor Conservation Lands, and Valadeao Ranch Conservation Lands show SJKF use on lands with up to 35% slopes.

**For Indirect Impacts: Slope acreage breakdown identified in the FEIR for the 2:1 mitigation ratio states that 100% of that ratio must include Slopes less than or equal to 11%. The amount in the 'Total Conservation Lands' column is the leftover acreage after Direct Impacts have been mitigated for.

4 CONCLUSIONS

LOA conducted focused BNLL and GKR surveys, as well as SJKF spotlight and camera trap surveys on the Silver Creek Ranch Conservation Lands in order to assess the current conditions of special status species on the Ranch. According to the results of these surveys, the Silver Creek Ranch Conservation Lands support BNLL, SJAS, GKR, and SJKF in high densities.

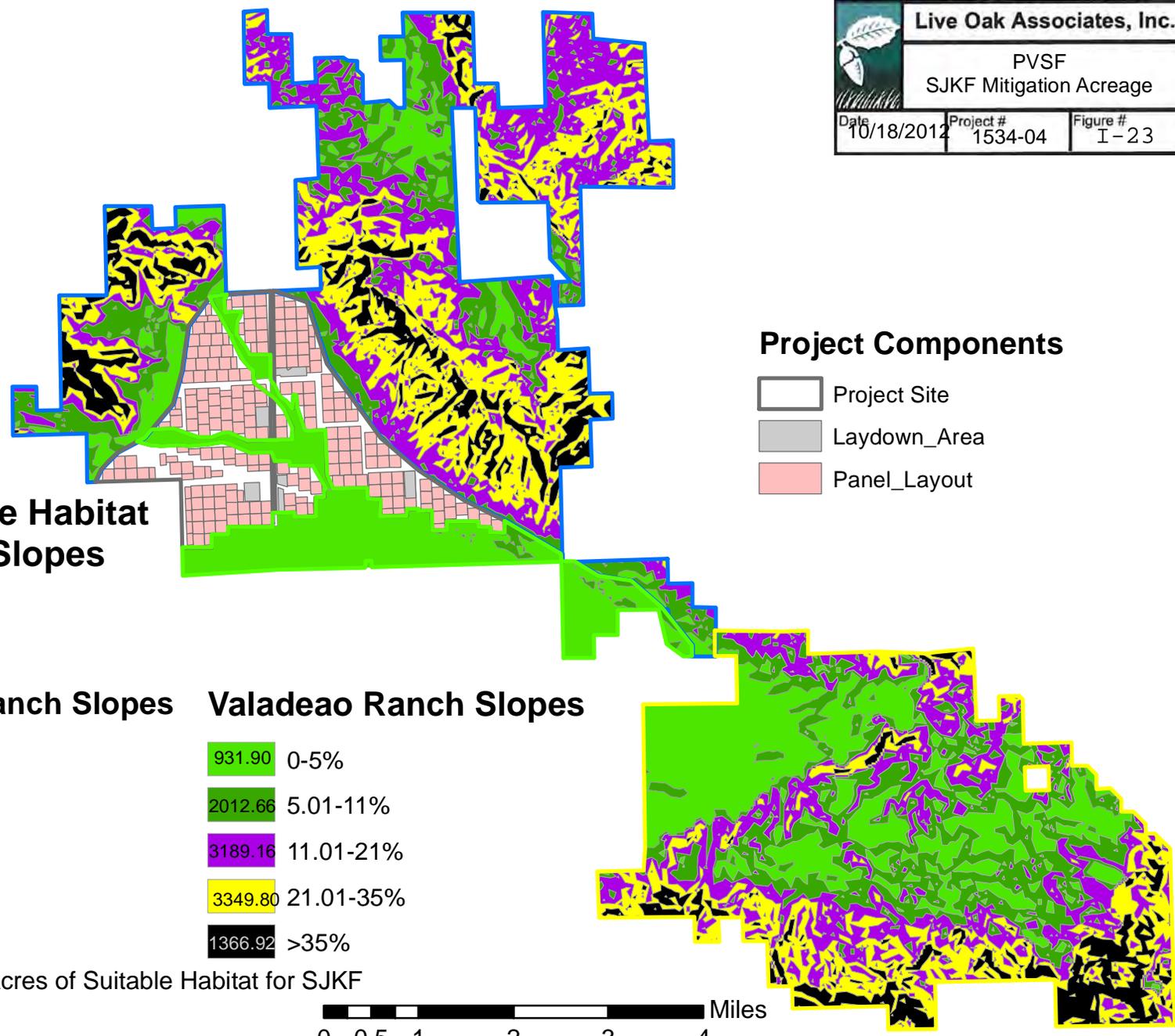
GKR colonies defined by Williams et al. (1995) were confirmed both on the Silver Creek Ranch and on the Valley Floor Conservation Lands. Williams et al. (1995) identified larger and more GKR colonies on the Silver Creek Ranch than on the valley floor in the 1992-1993 study, and this is still true today, as was shown by the results of the 2010 surveys on the valley floor and 2012 surveys on the Silver Creek Ranch. BNLL are also more prevalent on the Silver Creek Ranch than on the valley floor per LOA’s 2010 and 2012 surveys, and BNLL appear to use more

complex topography on the Silver Creek Ranch than they do on the valley floor, which appears to be limited habitat of the washes of Panoche and Las Aguilas Creeks. SJKF are also more prevalent on the Silver Creek Ranch than on all of the other lands together including the Project site, Valadeao Ranch Conservation Lands, and the Valley Floor Conservation Lands, as a total of 22 individual SJKF were detected on these lands in 2010 via scat-sniffing dog surveys and genetic analysis, and there were 137 detections of SJKF (a maximum of ten individuals in one night for both the eastern and western halves of the Silver Creek Ranch) during spotlighting surveys in 2012 and detection of SJKF at 17 of 20 camera trap stations on the Silver Creek Ranch in 2012. The conservation value of the Silver Creek Ranch exceeds the conservation value of the valley floor, with higher species diversity and greater relative distribution and abundance on the Silver Creek Ranch.

Additional special status species were detected during these surveys, including five detections of western burrowing owl (detected during the GKR and BNLL surveys, spotlighting surveys, and camera trap surveys; Figure I-24), 119 detections of SJAS (detected during the two-week long focused surveys for BNLL and GKR), and five detections of American badger (detected during spotlighting surveys and camera trap surveys), two of which were detections of a badger traveling with a SJKF.

The current community composition appears to be healthy, with a high species diversity (Figure I-25) and more complex vegetation and topography than the valley floor. Moderate to heavy stocking rates have been found to benefit all of these species (Barry et al. 2011; Germano et al. 2011), and the current moderate to heavy stocking rates on the Silver Creek Ranch appears to be acceptable and beneficial to these species.

The secured Silver Creek Ranch Conservation Lands include 10,889 acres of habitat located southeast of and contiguous to the Proposed Project. The Silver Creek Ranch is specifically identified in the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) and the Recovery Plan 5-year Reviews (USFWS 2010a, 2010b, 2010c), as an area with high habitat value for the Special Status Species such as the BNLL, GKR, SJKF, as well as several other Species of Concern in the Ciervo-Panoche Natural Area. The Recovery Plan (USFWS 1998:19) also identifies that the BLM has a program of acquisition in which the Silver Creek Ranch is one of the two main ranches that the BLM has a goal of purchasing. Based on the consistency of the Silver Creek Ranch Conservation Lands with the published recovery plans, the establishment of the Silver Creek Conservation Lands (and the other dedicated project Conservation lands) as a system that provides important linkages to other lands supporting the Special Status Species, and the field confirmation of the Special Status Species on the Silver Creek Ranch, these lands help to fully mitigate impacts to the listed species by improving the existing conservation value of the Proposed Project.



Project Components

-  Project Site
-  Laydown_Area
-  Panel_Layout

**SJKF Suitable Habitat
Valley Floor Slopes**

-  404.91 0-5%
-  91.29 5.01-11%

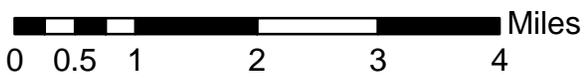
Silver Creek Ranch Slopes

-  3054.88 0-5%
-  2709.75 5.01-11%
-  2412.33 11.01-21%
-  1765.93 21.01-35%
-  956.37 >35%

Valadeao Ranch Slopes

-  931.90 0-5%
-  2012.66 5.01-11%
-  3189.16 11.01-21%
-  3349.80 21.01-35%
-  1366.92 >35%

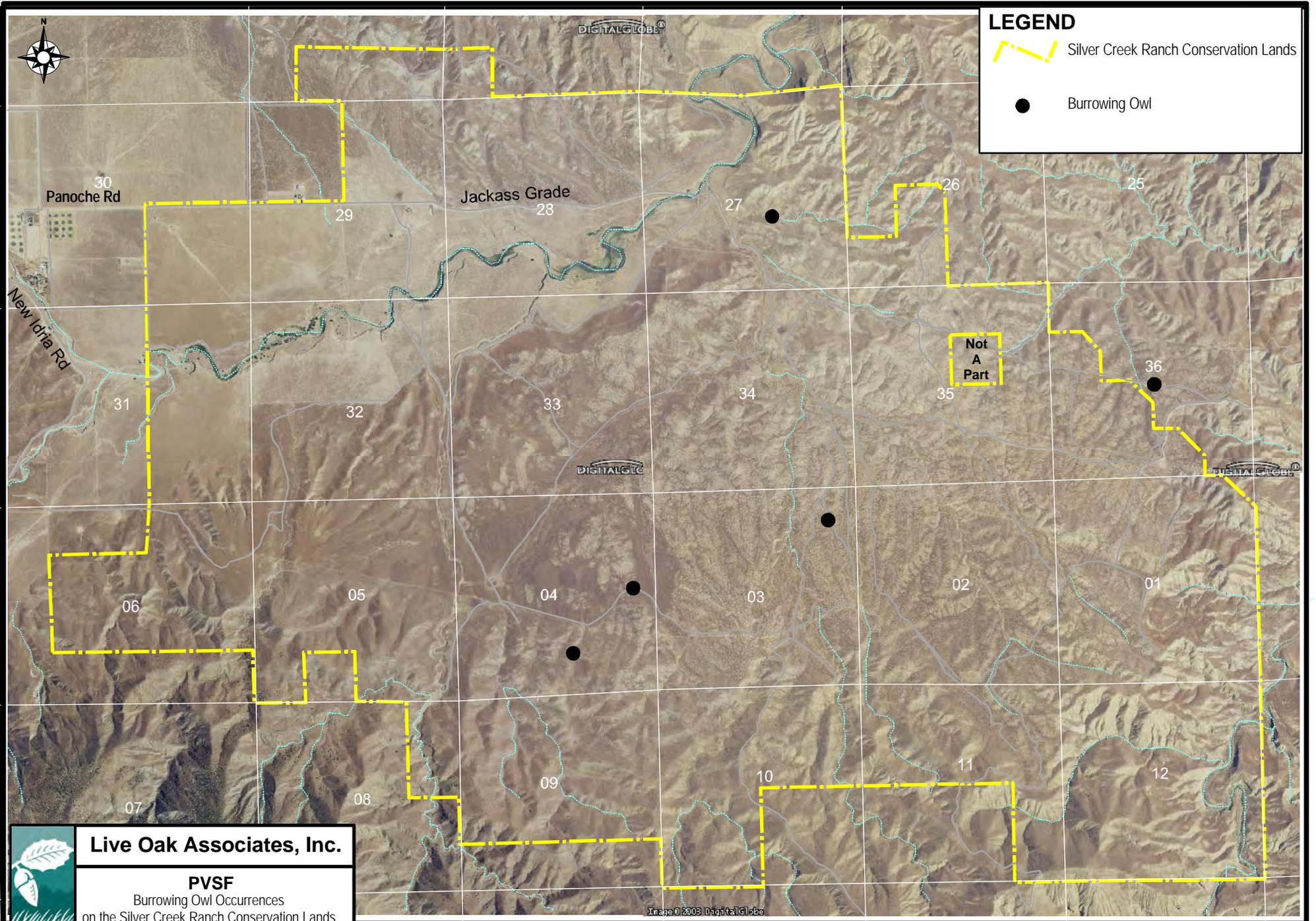
Total of 21,498.41 Acres of Suitable Habitat for SJKF





LEGEND

-  Silver Creek Ranch Conservation Lands
-  Burrowing Owl

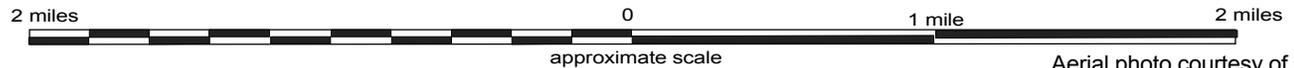


Live Oak Associates, Inc.

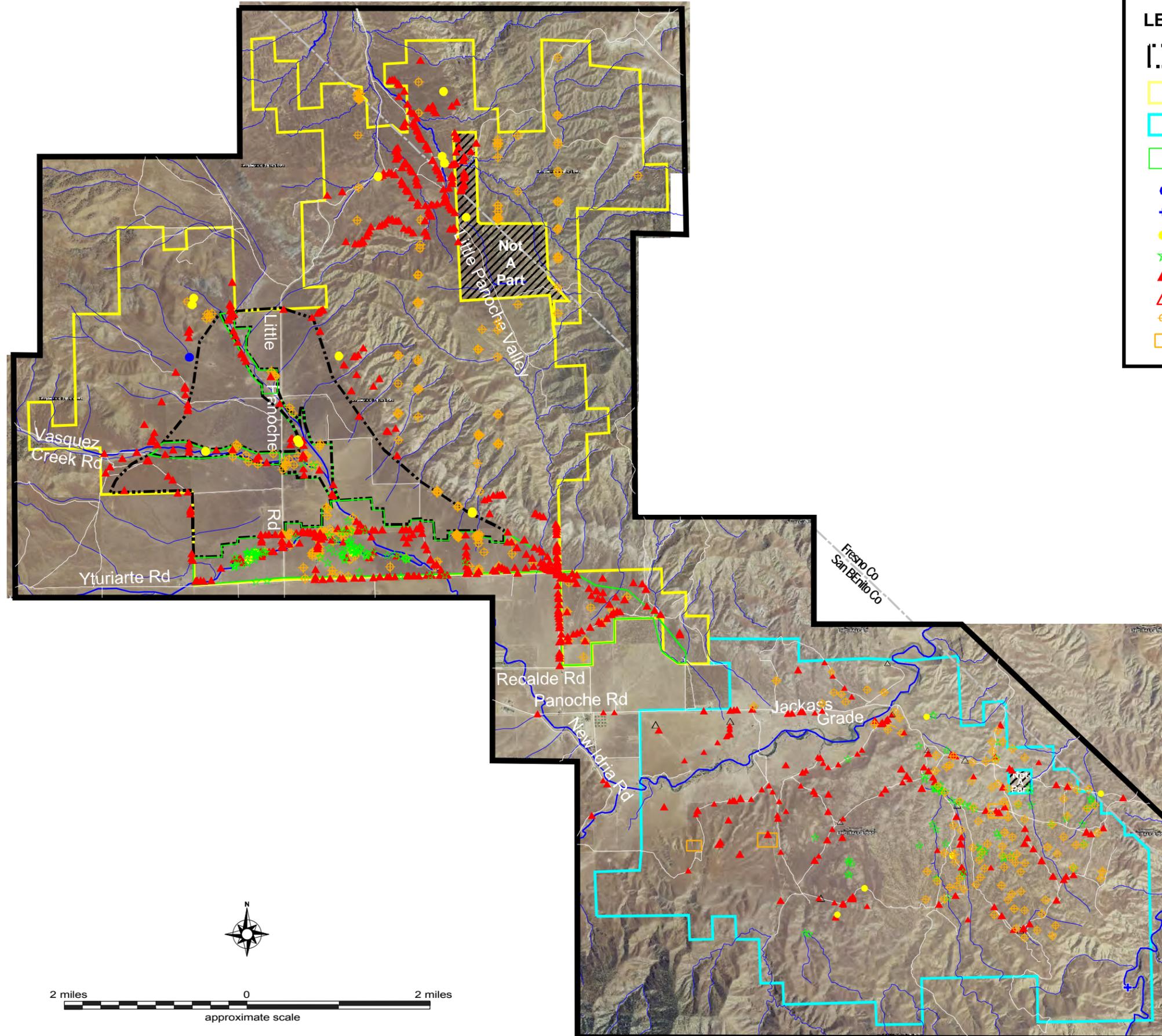
PVSF

Burrowing Owl Occurrences
on the Silver Creek Ranch Conservation Lands

Date	Project #	Figure #
11/14/2012	1534-04	I - 24

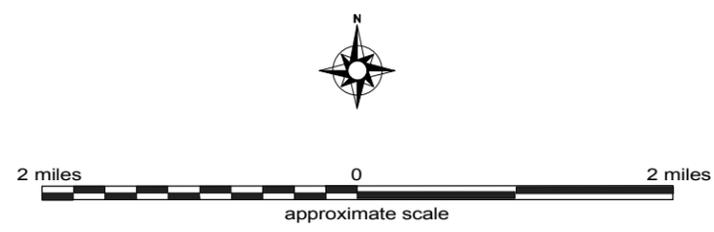


Aerial photo courtesy of Digital Globe



LEGEND

- Project Site
- Valadeao Ranch Conservation Lands
- Silver Creek Ranch Conservation Lands
- Valley Floor Conservation Lands
- California Tiger Salamander
- Western Pond Turtle
- Burrowing Owl
- Blunt-nosed Leopard Lizard
- San Joaquin Kit Fox
- Probable San Joaquin Kit Fox
- Giant Kangaroo Rat
- Giant Kangaroo Rat clusters



	Live Oak Associates, Inc.	
	PVSF Select Special-status Species In Mitigation Lands	
Date	Project #	Figure #
11/13/2012	1534-04	I-25

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