

June 27, 2016

8477

U.S. Fish and Wildlife Service  
Attention: Recovery Permit Coordinator  
6010 Hidden Valley Road  
Carlsbad, California 92011

***Subject: 2016 Focused Quino Checkerspot Butterfly Survey Report for the Proposed Jacumba Solar Energy Project, San Diego County, California***

Dear Ms. Love:

This letter report documents the spring 2016 results of a focused survey conducted by Dudek for the federally listed endangered Quino checkerspot butterfly (*Euphydryas editha quino*; Quino). This survey was conducted in support of the Jacumba Solar Energy project (project), a proposed solar energy development project east of the community of Jacumba in the southeastern portion of San Diego County, California. This report is intended to satisfy reporting requirements for the following Quino-permitted biologists: Erin Bergman (TE-53771B-0) and Callie Ford (TE-781084-9.1). Field assistance was provided by Patricia Schuyler, Marshall Paymard, and Janice Wondolleck as supervised by a permitted biologist.

## **PROJECT LOCATION AND EXISTING CONDITIONS**

The proposed project is composed of two major components: (1) the approximately 300-acre Jacumba Solar Energy project site and (2) construction of a new, 1,000-foot-long, 138-kilovolt (kV) generation-tie (gen-tie) transmission line required to connect the energy system to the existing East County (ECO) Substation. The 2016 Quino survey area included the proposed project's potential impact area and a portion of the proposed mitigation area adjacent to the impact area, totaling approximately 126 acres.

The project is located on private land approximately 3.5 miles east of the community of Jacumba, 0.5 miles south of Interstate 8 (I-8), and approximately 1.2 miles west of Imperial County in southeastern San Diego County, California, (see Figure 1, Regional Map). More specifically, the project site is situated south of Old Highway 80 and immediately north of the U.S./Mexico border, within the Jacumba U.S. Geological Survey 7.5-minute quadrangle, Township 18 South, Range 8 East, Sections 2 and 11 (see Figure 2, Vicinity Map). The proposed 126-acre survey area is situated within the following five Assessor's Parcel Numbers (APNs):

661-041-04-00; 661-080-01-00; 661-080-04-00; 661-080-05-01; and 661-080-08-00. The survey area is split into survey area 1 and survey area 2, as shown on Figure 3.

The survey area is undeveloped, with on-site elevation ranging between 3,010 and 3,160 feet above mean sea level (amsl). The site is relatively flat, except for a low hill near the southwest corner and several unvegetated channels that generally flow to the northwest across the site.

## Soils

According to the U.S. Department of Agriculture (2016), there are five soil types found in the project area; descriptions of these soil types, based on the Web Soil Survey (USDA 2016), appear below.

Acid igneous rock land soil is found in rough broken terrain. The topography ranges from low hills to very steep mountains. Large boulders and rock outcrops of granite, quartz diorite, gabbro, basalt, and other rock types cover greater than 50%–90% of the total area of this soil type. The soil material is very shallow, consisting of loam to loamy coarse sand textures over decomposed granite or basic igneous rock. Pockets of deep soils are present between the rocks in some locales. Many areas are practically barren and have very rapid runoff. The vegetation for this soil type varies by elevation and climate. In the foothills and mountains, acid igneous rock land supports various chaparral vegetation communities.

The Mecca series consists of well-drained, very deep coarse sandy loams derived from granitic alluvium. The A horizon is composed of brown to dark brown, moderately alkaline coarse sandy loam and is 8–12 inches thick. The C horizon ranges from yellowish brown or dark yellowish brown to light brown or reddish brown in color and a moderately alkaline calcareous coarse sandy loam to loam texture. This horizon extends to a depth of more than 60 inches. These soils are found on alluvial fans and alluvial plains with slopes of 0–5% and have moderate permeability. Mecca soils occur at elevations ranging from 200–2,000 feet amsl. The Mecca soil inclusion within the project area is the Mecca coarse sandy loam with 2%–5% slopes. This soil is gently sloping with slow runoff. Native vegetation expected on this soil type include cacti, creosote bush (*Larrea tridentata*), ocotillo (*Fouquieria splendens*), and annual grasses. Mecca soils are also used for range, irrigated alfalfa, small grain, and truck crops.

The Rositas series consists of excessively drained, very deep loamy coarse sands derived from granitic alluvium. The A horizon is approximately 3–8 inches thick, ranging from light brownish gray to pale brown or very pale brown in color and from loamy coarse sand or fine sand to sandy in texture. The C horizon extends to a depth of more than 60 inches. It ranges from pale brown to

very pale brown or light yellowish brown in color and from gravelly coarse sand to loamy fine sand in texture. The Rositas soil inclusion within the project area is the Rositas loamy coarse sand, 2%–9% slopes. This soil is gently to moderately sloping and found on alluvial fans and alluvial plains with slopes averaging 5%. Rositas soils occur at elevations ranging from 100 to 2,000 feet amsl. This soil series has a water holding capacity of 3–4 inches, with rapid permeability and slow to medium runoff. Native vegetation expected on this soil type is mainly ocotillo, cholla (*Cylindropuntia* spp.), creosote bush, saltbush (*Atriplex* spp.), and annual grasses.

The rough broken land series is made up of well drained to excessively drained soils associated with steep and very steep land. Areas of exposed raw sediments are commonly found within this soil series, including areas of very shallow soils. Runoff is rapid to very rapid and vegetation consists of sparse cover of low woody shrubs.

The sloping gullied land series occurs on alluvial fans in the desert adjacent to mountains. This soil series is found within steep talus slopes and fans below basalt ledges in the vicinity of Jacumba. The texture ranges from clay loam to gravelly, cobbly sand derived from igneous, sedimentary, and metamorphic rocks. Limy material has been exposed where gullies have dissected areas of old alluvium. The soils are shallow to moderately deep, underlain by basalt, volcanic tuff, and gravel, with medium to very rapid runoff. Native vegetation expected on this soil type is primarily desert shrubs, cacti, and annual forbs and grasses with sparse cover.

### Vegetation Communities

Six plant communities and land cover types were mapped within the focused Quino survey area, including disturbed land, Peninsular juniper woodland and scrub, semi-desert chaparral, Sonoran mixed woody scrub, upper Sonoran subshrub scrub, and urban/developed. The acreages of each community type within the survey area are shown in Table 1. Descriptions of each vegetation community (with Holland numeric codes) are provided following Table 1. Holland (1986) and Oberbauer et al. (2008) were used to describe vegetation communities on site. The Manual of California Vegetation (2nd edition) (Sawyer et al. 2009) was used as an additional reference to help determine characteristics (such as percentage of species cover) of various classifications.

**Table 1**  
**Vegetation Communities within the 2016 Focused Quino**  
**Checkerspot Butterfly Survey Area for the Jacumba Solar Energy Project**

Vegetation Community or Land Cover	Holland Code	Acres
Disturbed land	11300	9
Peninsular juniper woodland and scrub	72320	24

**Table 1**  
**Vegetation Communities within the 2016 Focused Quino**  
**Checkerspot Butterfly Survey Area for the Jacumba Solar Energy Project**

Vegetation Community or Land Cover	Holland Code	Acres
Semi-desert chaparral	37400	83
Sonoran mixed woody scrub	33210	4
Upper Sonoran subshrub scrub	39000	4
Urban/developed	12000	2
	<b>Total</b>	<b>126</b>

### ***Disturbed Land (11300)***

Disturbed land refers to areas that have been permanently altered by previous human activity that has eliminated all future biological value of the land for most species. The native or naturalized vegetation is no longer present, and the land lacks habitat value for sensitive wildlife, including potential raptor foraging.

Disturbed land found throughout the survey area consists primarily of unpaved roads (Figure 4, Vegetation Communities). These roads have been graded and contain little native vegetation. Disturbed land makes up 9 acres and is scattered in various locations throughout the survey area.

### ***Peninsular Juniper Woodland and Scrub (72320)***

Peninsular juniper woodland and scrub consists of relatively dense piñon woodland dominated by Parry pinyon (*Pinus quadrifolia*), with California juniper (*Juniperus californica*) occurring within xeric sites below the trees' dripline. This community occurs in alluvial fans and desert slopes that are slightly lower and more xeric than the Peninsular piñon woodland community (72310) with which it intergrades (Holland 1986). Other dominant species include Parry's beargrass (*Nolina parryi*), Sonoran scrub oak (*Quercus turbinella*), Mojave yucca (*Yucca schidigera*), and sagebrush (*Artemisia tridentata*).

Peninsular juniper woodland and scrub observed on site contains California juniper at greater than 4% absolute cover and lacks pines (*Pinus* spp.). Other commonly occurring species include creosote bush, jointfir (*Ephedra* spp.), goldenbush (*Ericameria* spp.), and snakeweed (*Gutierrezia* spp.). Peninsular juniper woodland and scrub occurs in large patches throughout the survey area (predominantly found within survey area 1), totaling 24 acres (Figure 4).

### **Semi-Desert Chaparral (37400)**

According to Holland (1986), semi-desert chaparral is similar to northern mixed chaparral (37710), but it is typically not quite as tall (1.5–3 meters, or 4.9–10 feet) and more open. Dominant taxa within this community include *Juniperus* spp., *Eriogonum* spp., and *Opuntia* spp. Characteristic species include chamise, *Arctostaphylos* spp., *Ceanothus* spp., *Quercus* spp., and a variety of other shrubs and subshrubs. This community is found on the high desert plateaus and escarpments of the Peninsular Range in San Diego County associated with drier, cooler winters (Holland 1986).

On site, semi-desert chaparral is found within areas where California juniper is less prominent (less than 4% absolute cover), including areas where California junipers have burned in the past and have not yet recovered. The semi-desert chaparral on site includes creosote bush, jointfir, goldenbush, cholla, Eastern Mojave buckwheat (*Eriogonum fasciculatum* var. *polifolium*), and common deerweed (*Acmispon glaber*). Semi-desert chaparral is the dominant vegetation community on site, totaling 83 acres within the survey area (Figure 4).

### **Sonoran Mixed Woody Scrub (33210)**

According to Holland (1986), Sonoran mixed woody scrub is similar to Sonoran mixed woody and succulent scrub (33220) but with additional woody species. Characteristic species include creosote bush, burrobush (*Ambrosia dumosa*), ocotillo, *Opuntia* spp., brittlebush (*Encelia farinosa*), and *Krameria* spp. In San Diego County, this community is associated with lower alluvial fans above the desert floor and below the coarse mountain substrates (Holland 1986).

Sonoran mixed woody scrub on site lack California juniper and are dominated by creosote bush, in addition to other shrub and succulent cover. Other commonly occurring species include jointfir, cholla, goldenbush, snakeweed, and strawberry cactus (*Mammillaria dioica*). Sonoran mixed woody scrub occurs in one small patch composed of 4 acres toward the central portion of the survey area (Figure 4).

### **Upper Sonoran Subshrub Scrub (39000)**

Upper Sonoran subshrub scrub is comprised of low, fairly penetrable scrub of soft-wooded, summer-dormant, drought-tolerant shrubs (Holland 1986). It is usually associated with well-drained soils derived from sandstone, shale, or sterile white diatomaceous deposits. In San Diego County, it intergrades with some chaparrals at higher elevations. Dominant vegetation found on site varies but usually includes narrowleaf goldenbush (*Ericameria linearifolia*), Eastern Mojave

buckwheat, bladderpod spiderflower (*Isomeris arborea arborea*), or California jointfir (*Ephedra californica*) (Holland 1986).

Areas mapped as upper Sonoran subshrub scrub are dominated by Eastern Mojave buckwheat, goldenbush, jointfir, cholla, and common deerweed. This area contains native shrub cover but lacks California juniper and creosote bush. Sonoran subshrub scrub occurs in one patch (approximately 4 acres) located along the southern portion of the survey area (Figure 4).

### **Urban/Developed (12000)**

Urban/developed land refers to areas that have been constructed upon or disturbed so severely that native vegetation is no longer supported. Developed land includes areas with permanent or semi-permanent structures, pavement or hardscape, landscaped areas, and areas with a large amount of debris or other materials (Oberbauer et al. 2008). Approximately 2 acres of urban/developed areas associated with Old Highway 80 occur within the survey area (Figure 4).

## **QUINO CHECKERSPOT BUTTERFLY SURVEY**

### **Background Information**

The Quino was added to the federal Endangered Species List by U.S. Fish and Wildlife Service (USFWS) on January 16, 1997 (62 FR 2313–2322). The species (*Euphydryas editha*) has a range extending from British Columbia and Alberta, Canada, south through Colorado and Utah, and west along the coast to northern Baja California. It is divided into 20 subspecies, each of which has its own range and biological and morphological characteristics. In California, there are 12 subspecies (Garth and Tilden 1986). Three other subspecies of *E. editha* are currently known to occur in Southern California. The Quino is the southwesternmost subspecies of *E. editha* (Mattoni et al. 1997).

The Quino is known to occur in association with a variety of plant communities, soil types, and elevations (up to 5,000 feet amsl). The plant communities include clay soil meadows, open grasslands, coastal sage scrub, chamise chaparral, red shank chaparral, juniper woodlands, and semi-desert scrub (Ballmer et al. 2001). The Quino is also associated with clay soils that possess cryptogamic crusts and vernal pools (USFWS 2002).

The Quino is a medium-sized butterfly (approximately 0.8- to 1.1-inch wingspan) belonging to the family Nymphalidae. The adults are primarily orange-red with white and have black markings on the dorsal wing surface. They are active primarily in March and April. This active period may vary depending on weather conditions (Ballmer et al. 2001). The adult butterfly feeds

on nectar, which it obtains from spring annuals such as cryptantha (*Cryptantha* spp.), whitedaisy tidytips (*Layia glandulosa*), goldenbush (*Ericameria* spp.), pincushion (*Chaenactis* spp.), common fiddleneck (*Amsinckia intermedia*), chia (*Salvia columbariae*), and bluedicks (*Dichelostemma capitatum*), among others.

Adult males and virgin females sometimes “hilltop,” or travel to elevated locations to find mates. While waiting for females to arrive, the males will often exhibit territorial behavior and will chase other butterflies that approach them. Frequently, the butterflies are observed in meadows or clearings where their host plants occur (Ballmer et al. 2001).

A female may lay 20 to 75 eggs at one time and may produce up to 1,200 eggs in her lifetime. The eggs hatch in approximately 10 days under favorable weather conditions and the young larvae will immediately begin to feed upon a host plant. The feeding larvae use the dotseed plantain (*Plantago erecta*), woolly plantain (*Plantago patagonica*), Coulter’s snapdragon (*Antirrhinum coulterianum*), and Chinese houses (*Collinsia concolor*) as their host plants (Pratt 2010). Stiffbranch bird’s-beak (*Cordylanthus rigidus*) and exserted Indian paintbrush (*Castilleja exserta*) are considered secondary hosts (USFWS 2002).

After feeding, the early larva enters an obligatory aestival diapause (dormant stage), which may be broken after fall or winter rains (Murphy and White 1984; Osborne 1998). If adverse weather conditions occur, the emergent larva may reenter a diapause stage repeatedly, for up to 5 or 6 years, until favorable weather conditions permit sufficient growth of the host plant to allow the larva to complete its development.

The Quino was once common in Southern California. It ranged north into Ventura County, west to the Pacific Ocean, east to the deserts, and south into northern Baja California. Currently, it is known to occur only in a few, probably isolated, colonies in southwestern Riverside County, San Diego County, and northern Baja California.

Reasons for the butterfly’s reduction in population are not well understood. Habitat loss due to degradation and fragmentation caused by urban and rural development, agricultural conversion, off-road-vehicular use, the invasion of nonnative plants and insects, fire management practices, over collecting, and adverse weather conditions have likely contributed to the species’ decline (62 FR 2313–2322).

The 2014 USFWS protocol recommends that focused Quino surveys be conducted a minimum of 12 times during the adult flight season by biologists possessing a recovery permit for this species pursuant to Section 10(a)(1)(A) of the Endangered Species Act (USFWS 2014).

## Methods

### **Focused Quino Surveys**

Focused Quino surveys for a portion (potential impact areas and a mitigation area totaling 126 acres) of the site were conducted over 24 visits within a 12-week period between February 19, 2016, and May 13, 2016, per the USFWS Quino Checkerspot Butterfly Survey Guidelines published on December 15, 2014.

In accordance with current USFWS protocol for the Jacumba region (USFWS 2014), a total of 12 surveys were conducted by Quino-permitted biologists Erin Bergman (TE-53771B-0) and Callie Ford (TE-781084-9.1); Patricia Schuyler, Janice Wondolleck and Marshall Paynard assisted with field surveys.

According to the December 15, 2014, USFWS protocol, the first weekly survey shall begin during the third week of February and the survey season will end the second Saturday in May. Surveys shall be conducted weekly and spaced no closer than 4 days apart.

The survey area was divided into two survey polygons, each representing a single-day survey effort (in accordance with USFWS protocol) (see Figure 3, Survey Areas, and Table 2). These survey areas were numbered and assigned to Dudek's permitted biologists and independent investigators. The biologists were provided with 200-scale (1 inch = 200 feet) aerial photographs of each survey polygon. These photographs were used for mapping host plant populations and Quino, if observed. Binoculars were used to aid in detecting and identifying butterfly and other wildlife species. GPS units also were used for recording locations of host plant populations.

**Table 2**  
**2016 Quino Checkerspot Butterfly Survey Polygons**

Survey Area	Acreage of Survey Area
1	63
2	63

The survey methods consisted of slowly walking roughly parallel transects spaced approximately 30 feet (10 meters) apart throughout all habitats within the 126-acre survey area. Survey routes were arranged to thoroughly cover the survey area at a rate of no more than 5–10 acres per person hour. All wildlife species were recorded and are listed in Appendix A. All plants in bloom were recorded as potential nectar sources for Quino and are listed in Appendix B.



*Recovery Permit Coordinator*

*Subject: 2016 Focused Quino Checkerspot Butterfly Survey Report for the Proposed Jacumba Solar Energy Project, San Diego County, California*

Surveys were conducted only during acceptable weather conditions (i.e., surveys were not conducted during fog, drizzle, or rain; winds greater than 15 miles per hour measured 4–6 feet above ground level for more than 30 seconds; temperature in the shade at ground level less than 60°F on a clear, sunny day; or temperature in the shade at ground level less than 70°F on an overcast or cloudy day. Survey times, personnel, and conditions during the Quino survey are shown in Table 3. Photocopies of the surveyors’ field notes are included as Appendix B.

**Table 3  
Schedule of Focused Quino Checkerspot Butterfly Surveys and Environmental Conditions**

Survey Pass	Date	Hours	Personnel	Survey Area	Conditions
1	2016/02/19	10:35 AM–5:06 PM	EBE	2	67°F–79°F, 0%–20% cc, 1–3 mph wind
1	2016/02/21	8:21 AM–2:28 PM	CJF, EBE	1	72°F–79°F, 0% cc, 1–2 mph wind
2	2016/02/25	9:19 AM–4:24 PM	EBE, MPA, PSC	1,2	78°F–85°F, 0% cc, 2–3.5 mph wind
3	2016/03/05	7:33 PM–5:28 PM	EBE	1,2	66°F–72°F, 30%–40% cc, 1.5–2.5 mph wind
3	2016/03/06	9:03 AM–1:56 PM	EBE	1	61°F–65°F, 10%–30% cc, 4.5 mph wind
4	2016/03/11	8:24 AM–3:46 PM	EBE	1,2	66.3°F–67.6°F, 30% cc, 1–2.4 mph wind
4	2016/03/13	10:11 AM–5:34 PM	EBE	2	61.4°F–61.8°F, 10% cc, 1.4–2.9 mph wind
5	2016/03/21	8:57 AM–4:27 PM	EBE	1,2	66.2°F–70.3°F, 0%–10% cc, 1.8–1.9 mph wind
5	2016/03/22	10:41 AM–3:33 PM	EBE	1	62.4°F–64.1°F, 0% cc, 2.3 mph wind
5	2016/03/26	11:04 AM–3:49 PM	EBE	1	61.4°F–73.7°F, 0% cc, 1.1–1.3 mph wind
6	2016/04/01	9:33 AM–4:29 PM	EBE	2	62.5°F–77.6°F, 0% cc, 2.6–3.1 mph wind
6	2016/04/02	9:07 AM–4:34 PM	EBE	1	63.4°F–78.9°F, 0% cc, 2.3–2.4 mph wind
7*	2016/04/08	9:50 AM–10:15 AM	EBE, JWO	2	55°F–55.1°F, 100% cc, 2.8–3.7 mph wind
7	2016/04/12	9:07 AM–4:56 PM	EBE	2	63.7°F–73.6°F, 20%–30% cc, 2.8–3.3 mph wind
7	2016/04/13	9:09 AM–4:52 PM	EBE	1	60.2°F–70.1°F, 0%–10% cc, 1.4–1.6 mph wind
8	2016/04/16	10:29 AM–5:12 PM	EBE	2	76.3°F, 0% cc, 2.6–4.2 mph wind
8	2016/04/17	9:02 AM–5:05 PM	EBE	1	76.3°F–78.1°F, 0%–10% cc, 1.1–1.2 mph wind
9	2016/04/22	8:50 AM–7:46 PM	EBE, MPA	2	75.8°F–79.4°F, 0% cc, 1.2–3.7 mph wind
9	2016/04/23	8:29 AM–5:14 PM	EBE	1	66.4°F–70.2°F, 0% cc, 1.1–2.1 mph wind
10	2016/04/29	9:27 AM–4:10 PM	EBE	1,2	60.1°F–72°F, 0% cc, 1.5 mph wind
10	2016/05/01	9:42 AM–4:19 PM	EBE	2	62.3°F–74.3°F, 0%–10% cc, 1.8–2.6 mph wind
11	2016/05/05	9:51 PM–4:37 PM	EBE	2	61.3°F–63.7°F, 10%–20% cc, 1.8–3.6 mph wind
11	2016/05/08	9:23 AM–4:05 PM	EBE, MPA	1	65.7°F–69.5°F, 10%–20% cc, 1.4–1.7 mph wind
12	2016/05/13	10:30 AM–4:39 PM	CJF	1	76°F–78°F, 0%–10% cc, 2–3.1 mph wind
12	2016/05/13	10:25 AM–4:49 PM	EBE	2	76°F–78°F, 0%–10% cc, 2–3.1 mph wind

**Personnel:** EBE = Erin Bergman (TE-53771B-0); CJF = Callie Ford (TE-781084-9.1); PSC = Patricia Schuyler; MPA = Marshall Paynard; JWO = Janice Wondolleck.

**Notes:** cc = cloud cover; mph = miles per hour.

### Host Plant Mapping

Quino host plant mapping surveys were conducted before the Quino survey started as well as concurrently with focused Quino surveys and rare plant surveys. Host plants were detected on site within a 4-week period between April 12, 2016, and May 13, 2016, in accordance with the schedule provided in Table 4. Botanical surveys were conducted by biologists Erin Bergman (TE-53771B-0) and Callie Ford (TE-781084-9.1). All surveys were conducted on foot. Approximately 5 person-days were spent conducting host plant mapping within the survey area.

Host plant mapping surveys focused on the identification and location of all seven recognized host plants for Quino: dotseed plantain, exserted Indian paintbrush, woolly plantain, Coulter's snapdragon, stiffbranch bird's beak, Chinese houses, and purple Chinese houses (*Collinsia heterophylla*) (USFWS 2014). All host plants were included in the survey.

**Table 4**  
**Schedule of Host Plant Mapping Surveys**

Date	Hours	Personnel	Survey Type	Conditions (temperature, cloud cover, wind speed)
2016/4/12	9:07 AM–4:56 PM	EBE	Quino	63.7°F–73.6°F, 20%–30% cc, 2.8–3.3 mph wind
2016/4/16	10:29 AM–5:12 PM	EBE	Quino	76.3°F–76.3°F, 0% cc, 2.6–4.2 mph wind
2016/4/20	9:00 AM–4:32 PM	EBE, CJF	Rare Plants	79°F–86°F, 0%–10% cc, 0–1.7 mph wind
2016/5/13	10:25 AM–4:49 PM	EBE	Quino	76°F–78°F, 0%–10% cc, 2–3.1 mph wind

**Personnel:** EBE = Erin Bergman (TE-53771B-0); CJF = Callie Ford (TE-781084-9.1).

**Notes:** cc = cloud cover; mph = miles per hour.

Dudek biologists recorded locations of Quino host plants using a mobile application. Data collected included the surveyor(s), date, species of host plant, and density of the host plant at the point at which the host plant was found. All host plant occurrences were mapped as points. Density was assessed per square meter (approximately 11 square feet) and was collected using the following classes:

- Very Low: 1–19 plants per square meter
- Low: 20–100 plants per square meter
- Medium: 100–1,000 plants per square meter
- High: 1,000–10,000+ plants per square meter

Points were collected within patches of host plant at least as close as every 3 meters (10 feet). In addition, all blooming nectar plants were recorded for the entire survey area.

At the conclusion of surveys, Dudek GIS analysts created a GIS coverage for host plants. After review by a biologist, a geodatabase was created to ensure that these data were topologically correct and met final quality control and assurance procedures.

## Results

### Focused Quino Surveys

No Quino were observed during the 2016 focused survey. A total of 16 butterfly species were observed during the surveys. The weeks in which these butterflies were observed are shown in Tables 5A and 5B.

**Table 5A**  
**Butterflies Observed on Site Weeks 1–6**

Scientific Name	Common Name	Week					
		1 2/19–2/24	2 2/25–3/4	3 3/5–3/10	4 3/11–3/20	5 3/21–3/26	6 4/19–4/7
<i>Hesperiidae – Skippers</i>							
<i>Erynnis funeralis</i>	funereal duskywing	—	—	X	—	X	X
<i>Nymphalidae – Brush-Footed Butterflies</i>							
<i>Euphydryas chalcedona</i>	variable checkerspot	—	—	—	X	X	X
<i>Chlosyne californica</i>	California patch	—	X	—	X	—	—
<i>Vanessa cardui</i>	painted lady	X	—	X	—	—	—
<i>Lycaenidae – Blues and Hairstreaks</i>							
<i>Callophrys gryneus</i>	juniper hairstreak	X	—	—	—	—	—
<i>Atlides halesus</i>	great purple hairstreak	X	—	—	—	—	—
<i>Philotes sonorensis</i>	Sonoran blue	—	—	—	—	—	X
<i>Plebejus acmon</i>	Acmon blue	—	—	—	—	—	—
<i>Papilionidae – Swallowtails</i>							
<i>Papilio polyxenes coloro</i>	desert black swallowtail		—	—	—	—	—
<i>Pieridae – Whites and Sulphurs</i>							
<i>Anthocharis sara</i>	Pacific sara orangetip	—	—	X	X	X	X
<i>Anthocharis cethura</i>	desert orangetip	—	X	X	X	X	X
<i>Colias harfordii</i>	Harford's sulphur	—	—	—	X	—	X
<i>Euchloe hyantis</i>	desert pearly marble	—	—	X	X	—	X
<i>Eurema nicippe</i>	sleepy orange	—	—	—	—	X	—
<i>Nathalis iole</i>	dainty sulphur	—	—	—	—	—	—
<i>Pontia protodice</i>	checkered white	—	—	—	X	X	X

**Table 5B**  
**Butterflies Observed on Site Weeks 7–12**

Scientific Name	Common Name	Week					
		7 4/8–4/15	8 4/16–4/21	9 4/22–4/28	10 4/29–5/4	11 5/5–5/8	12 5/13
<i>Hesperiidae – Skippers</i>							
<i>Erynnis funeralis</i>	funereal duskywing	—	—	—	—	—	—
<i>Nymphalidae – Brush-Footed Butterflies</i>							
<i>Euphydryas chalcedona</i>	variable checkerspot	X	X	X	X	X	—
<i>Chlosyne californica</i>	California patch	—	—	—	—	—	X
<i>Vanessa cardui</i>	painter lady	—	—	—	—	—	—
<i>Lycaenidae – Blues and Hairstreaks</i>							
<i>Callophrys gryneus</i>	juniper hairstreak	X	X	—	—	—	—
<i>Atlides halesus</i>	great purple hairstreak	—	—	—	—	—	—
<i>Philotes sonorensis</i>	Sonoran blue	—	—	—	—	—	—
<i>Plebejus acmon</i>	Acmon blue	—	—	X	X	—	—
<i>Papilionidae – Swallowtails</i>							
<i>Papilio polyxenes coloro</i>	desert black swallowtail	X	—	X	X	X	—
<i>Pieridae – Whites and Sulphurs</i>							
<i>Anthocharis sara</i>	Pacific sara orangetip	X	X	X	X	—	—
<i>Anthocharis cethura</i>	desert orangetip	X	X	X	X	X	—
<i>Colias harfordii</i>	Harford's sulphur	—	X	X	X	—	X
<i>Euchloe hyantis</i>	desert pearly marble	X	X	X	X	X	X
<i>Eurema nicippe</i>	sleepy orange	—	X	—	—	—	—
<i>Nathalis iole</i>	dainty sulphur	—	X	X	X	—	—
<i>Pontia protodice</i>	checkered white	—	—	—	—	—	—

### Host Plant Mapping

Five populations of Quino larval host plants were observed within the survey area during focused surveys, including dotseed plantain. Dotseed plantain was recorded and mapped on Figure 5. Table 6 includes the known and observed adult Quino nectar plants (according to Mattoni et al. 1997; USFWS 2002, 2003; 67 FR 18355–18395). Larval host plants are also included in Table 6 and are in bold print. All plant species that were in bloom were documented in the field notes. No Quino larvae were observed during focused Quino and host plant mapping surveys.

**Table 6**  
**Quino Larval Food and Adult Nectar Plants**

Scientific Name	Common Name	Observed During Focused Survey
<i>Apiaceae – Carrot Family</i>		
<i>Lomatium dasycarpum</i> ssp. <i>dasycarpum</i>	woollyfruit desertparsley	X
<i>Lomatium utriculatum</i>	common lomatium	—
<i>Asteraceae – Sunflower Family</i>		
<i>Achillea millefolium</i>	common yarrow	—
<i>Lasthenia californica</i> or <i>Lasthenia gracilis</i>	California goldfields or needle goldfields	—
<i>Lasthenia coronaria</i>	royal goldfields	—
<i>Layia platyglossa</i>	coastal tidytips	X
<i>Boraginaceae – Borage Family</i>		
<i>Amsinckia menziesii</i>	Menzies' fiddleneck	X
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	rancher's fiddleneck	—
<i>Amsinckia menziesii</i> var. <i>menziesii</i>	rigid fiddleneck	—
<i>Cryptantha</i> spp. or <i>Plagiobothrys</i> spp.	popcornflower	X
<i>Fabaceae – Pea Family</i>		
<i>Acmispon glaber</i>	common deerweed	—
<i>Lotus</i> spp.	spanishclover, lotus	—
<i>Hydrophyllaceae – Waterleaf Family</i>		
<i>Eriodictyon crassifolium</i> var. <i>crassifolium</i>	thickleaf yerba santa	—
<i>Eriodictyon trichocalyx</i> var. <i>trichocalyx</i>	hairy yerba santa	—
<i>Phacelia distans</i>	distant phacelia	—
<i>Lamiaceae – Mint Family</i>		
<i>Salvia columbariae</i>	chia	X
<i>Plantaginaceae – Plantain Family</i>		
<b><i>Plantago erecta</i></b>	<b>dotseed plantain</b>	X
<b><i>Plantago patagonica</i></b>	<b>woolly plantain</b>	—
<i>Polemoniaceae – Phlox Family</i>		
<i>Gilia angelensis</i>	chaparral gilia	—
<i>Gilia capitata</i> ssp. <i>abrotanifolia</i>	bluehead gilia	—
<i>Linanthus</i> spp.	ground pink	—
<i>Polygonaceae – Buckwheat Family</i>		
<i>Eriogonum fasciculatum</i> var. <i>foliolosum</i>	Eastern Mojave buckwheat	—
<i>Scrophulariaceae – Figwort Family</i>		
<b><i>Antirrhinum coulterianum</i></b>	<b>Coulter's snapdragon</b>	—
<b><i>Castilleja exserta</i></b>	<b>exserted Indian paintbrush</b>	—
<b><i>Collinsia</i> spp.</b>	<b>Chinese houses</b>	—
<b><i>Cordylanthus rigidus</i> ssp. <i>setiger</i></b>	<b>stiffbranch bird's-beak</b>	—
<i>Keckiella antirrhinoides</i> var. <i>antirrhinoides</i>	snapdragon penstemon	—

Recovery Permit Coordinator

Subject: 2016 Focused Quino Checkerspot Butterfly Survey Report for the Proposed Jacumba Solar Energy Project, San Diego County, California

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**Table 6**  
**Quino Larval Food and Adult Nectar Plants**

Scientific Name	Common Name	Observed During Focused Survey
<i>Keckiella cordifolia</i>	heartleaf keckiella	—
<i>Liliaceae – Lily Family</i>		
<i>Allium haematochiton</i>	redskin onion	—
<i>Allium peninsulare</i>	Mexicali onion	—
<i>Allium praecox</i>	early onion	—
<i>Bloomeria clevelandii</i>	San Diego goldenstar	—
<i>Dichelostemma capitatum</i>	bluedicks	—
<i>Muilla maritima</i>	sea muilla	—

**Sources:** List derived from Mattoni et al. 1997; USFWS 2002, 2003; 67 FR 18355–18395 (for *Euphydryas editha*).

**Note:** Plants listed in **bold** print are known Quino larval host plant species.

Fifty-one (51) wildlife species were recorded during this survey effort and are included in Appendix A, Wildlife Observed during the 2016 Jacumba Quino Survey.

Dudek certifies that the information in this survey report and attached exhibits fully and accurately represents the work conducted by the Quino-permitted biologists who conducted this focused survey.

Please feel free to contact Brock A. Ortega at [bortega@dudek.com](mailto:bortega@dudek.com) if you have any questions regarding the contents of this report.

Sincerely,



Erin Bergman

Permit No. TE-53771B-0



Callie Ford

Permit No. TE-781084-9.1

Att: *Figure 1, Regional Map*

*Figure 2, Vicinity Map*

*Figure 3, 2016 Quino Checkerspot Butterfly Survey Areas*

*Figure 4, Vegetation Communities*

*Figure 5, 2016 Quino Checkerspot Butterfly Host Plant Mapping*

*Appendix A – List of Wildlife Species Observed during the 2016 Jacumba Solar Energy Project Quino Survey*

*Appendix B – 2016 Jacumba Solar Energy Project Quino Survey Field Notes*

cc: *Andy Flajole, NextEra Energy*

*Brock Ortega, Dudek*

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*Recovery Permit Coordinator*

*Subject: 2016 Focused Quino Checkerspot Butterfly Survey Report for the Proposed Jacumba Solar Energy Project, San Diego County, California*

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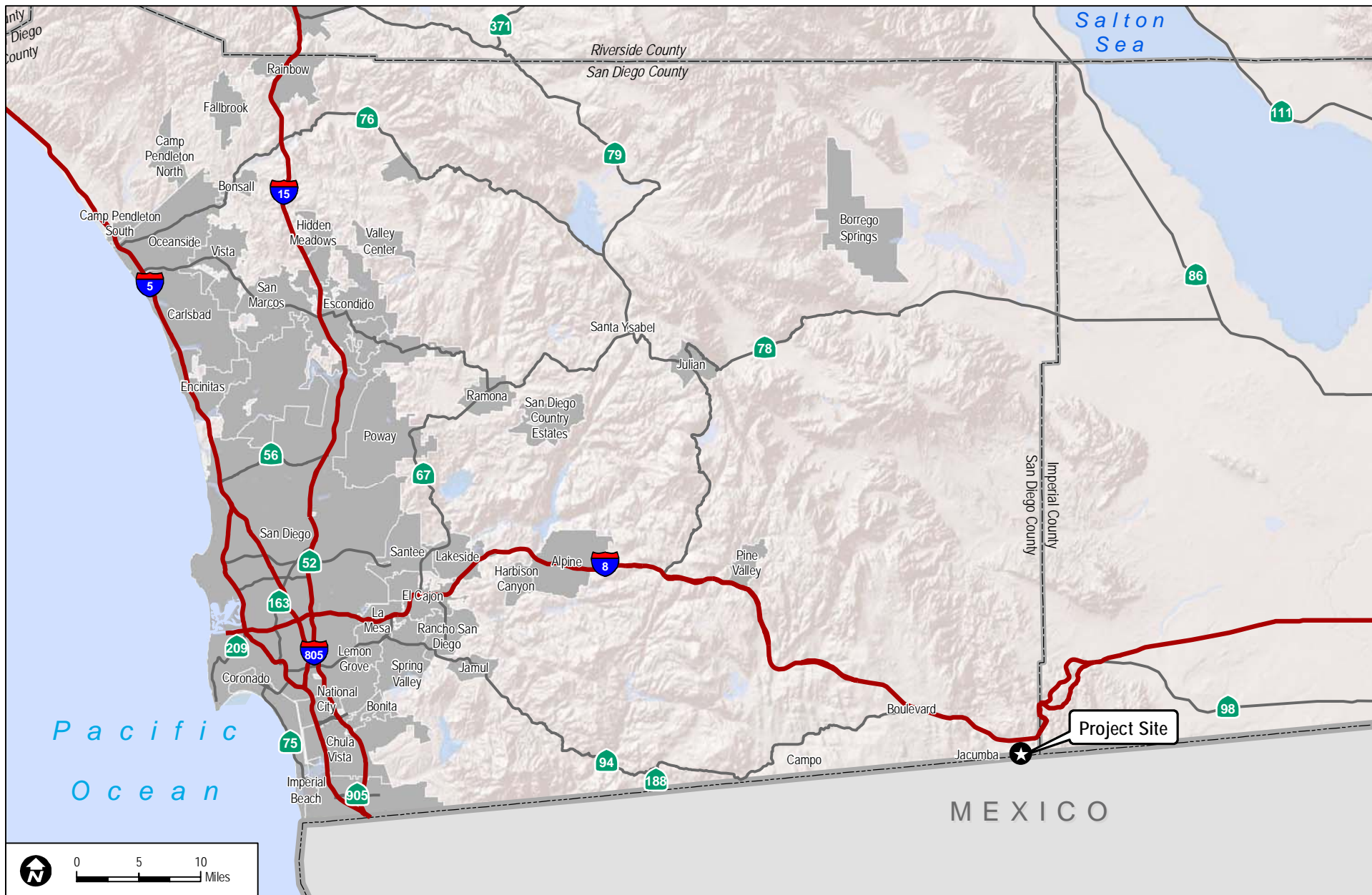
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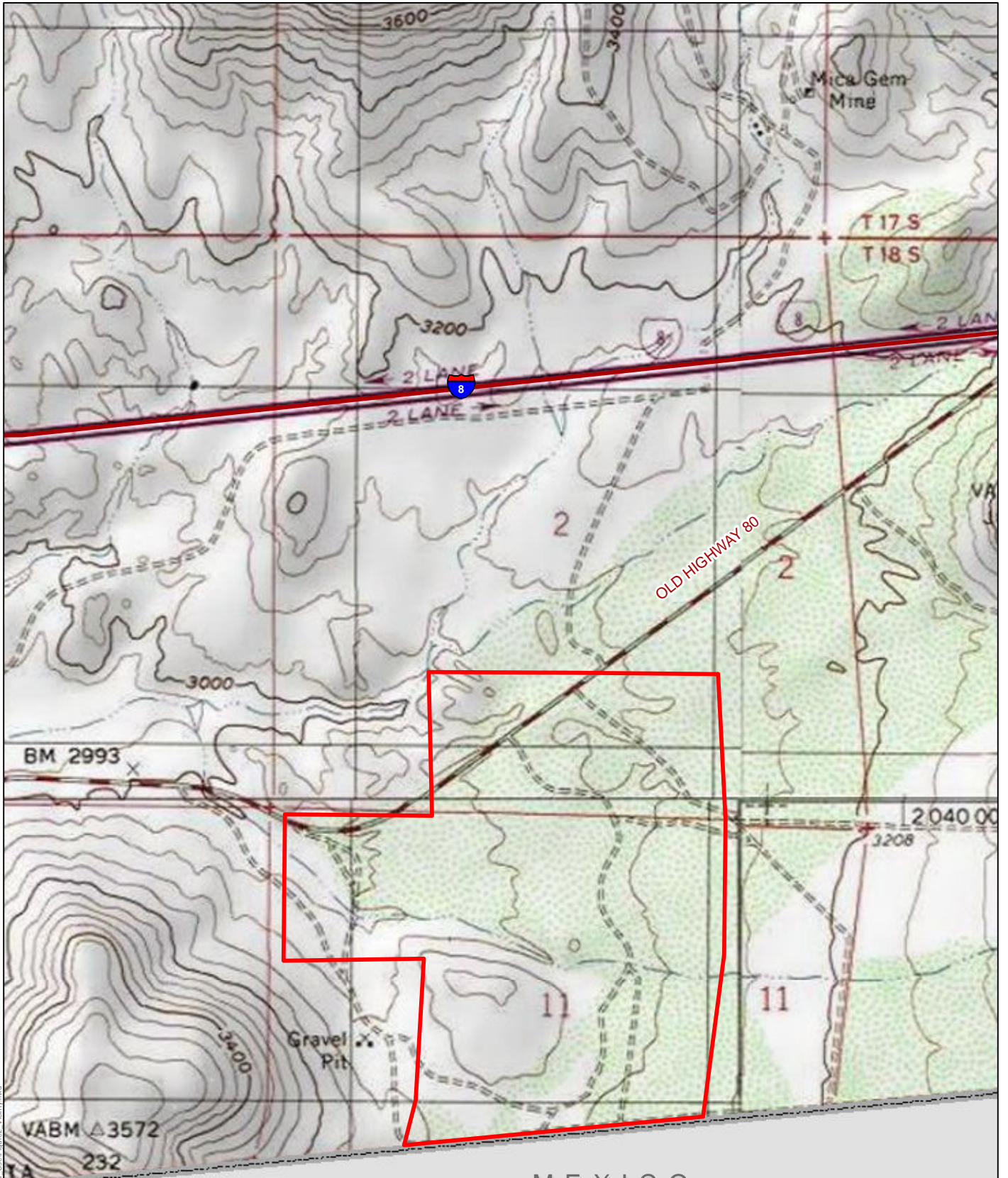
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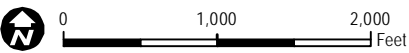
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**FIGURE 1**  
**Regional Map**





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Project Boundary

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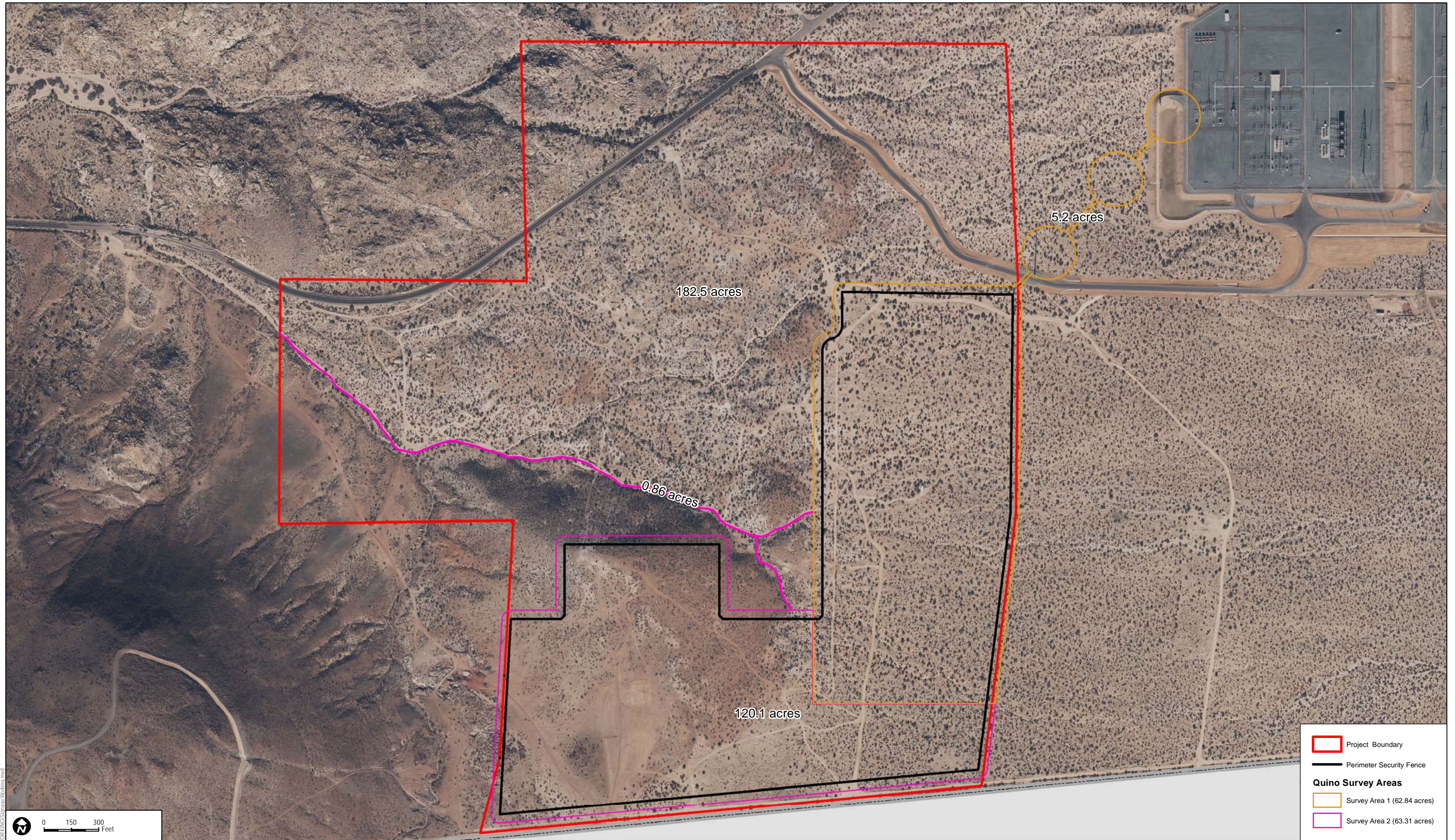
**FIGURE 2**  
**Vicinity Map**

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Jacumba Solar Project

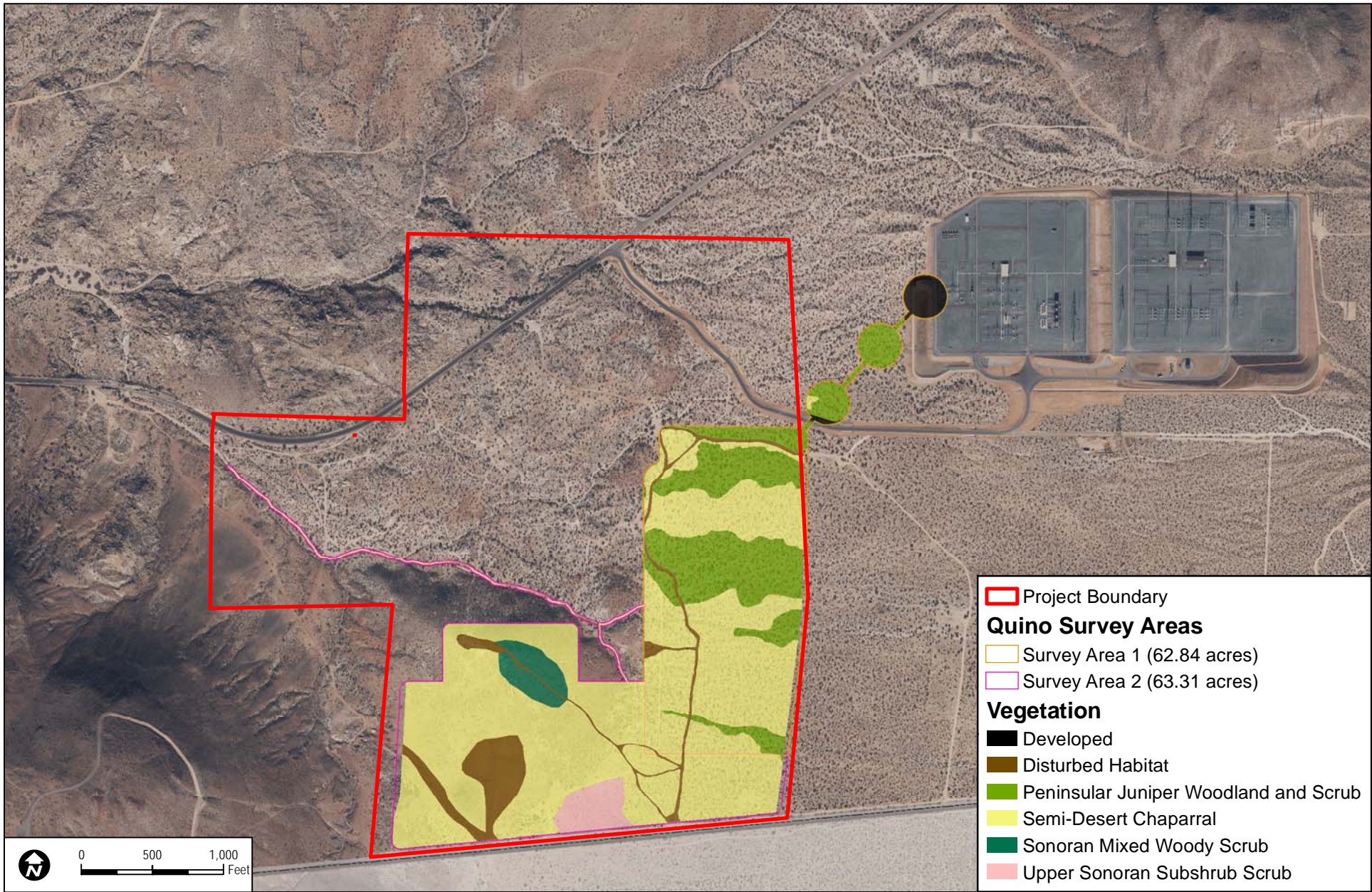
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**FIGURE 3**  
**2016 Quino Checkerspot Butterfly Survey Areas**











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SOURCE: SanGIS 2014; Bing Maps

**FIGURE 5**

**2016 Quino Checkerspot Butterfly Host Plant Mapping**

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Jacumba Solar Project



# **APPENDIX A**

*List of Wildlife Species Observed  
during the 2016 Jacumba Solar Quino Survey*



**APPENDIX A**  
**List of Wildlife Species Observed**  
**during the 2016 Jacumba Solar Quino Survey**

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**BIRD**

**BLACKBIRDS, ORIOLES, AND ALLIES**

***ICTERIDAE—BLACKBIRDS***

*Icterus cucullatus*—hooded oriole

**BUSHTITS**

***AEGITHALIDAE—LONG-TAILED TITS AND BUSHTITS***

*Psaltriparus minimus*—bushtit

**EMBERIZINES**

***EMBERIZIDAE—EMBERIZIDS***

*Amphispiza bilineata*—black-throated sparrow

*Chondestes grammacus*—lark sparrow

*Melospiza melodia*—song sparrow

*Spizella breweri*—Brewer's sparrow

*Spizella passerina*—chipping sparrow

*Junco hyemalis*—dark-eyed junco

**FINCHES**

***FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES***

*Haemorhous mexicanus*—house finch

**FLYCATCHERS**

***TYRANNIDAE—TYRANT FLYCATCHERS***

*Myiarchus cinerascens*—ash-throated flycatcher

**GOATSUCKERS**

***CAPRIMULGIDAE—GOATSUCKERS***

*Chordeiles acutipennis*—lesser nighthawk

## APPENDIX A (Continued)

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### HAWKS

#### ***ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES***

*Buteo jamaicensis*—red-tailed hawk

### HUMMINGBIRDS

#### ***TROCHILIDAE—HUMMINGBIRDS***

*Calypte anna*—Anna's hummingbird

### JAYS, MAGPIES, AND CROWS

#### ***CORVIDAE—CROWS AND JAYS***

*Aphelocoma californica*—western scrub-jay

*Corvus brachyrhynchos*—American crow

*Corvus corax*—common raven

### KINGLETS

#### ***REGULIDAE—KINGLETS***

*Regulus calendula*—ruby-crowned kinglet

### LARKS

#### ***ALAUDIDAE—LARKS***

*Eremophila alpestris*—horned lark

### MOCKINGBIRDS AND THRASHERS

#### ***MIMIDAE—MOCKINGBIRDS AND THRASHERS***

*Mimus polyglottos*—northern mockingbird

### NEW WORLD VULTURES

#### ***CATHARTIDAE—NEW WORLD VULTURES***

*Cathartes aura*—turkey vulture

### OLD WORLD WARBLERS AND GNATCATCHERS

#### ***SYLVIIDAE—SYLVIID WARBLERS***

*Polioptila caerulea*—blue-gray gnatcatcher

## APPENDIX A (Continued)

---

### OWLS

#### ***STRIGIDAE—TYPICAL OWLS***

*Athene cunicularia*—burrowing owl

*Bubo virginianus*—great horned owl

### SILKY FLYCATCHERS

#### ***PTILOGONATIDAE—SILKY-FLYCATCHERS***

*Phainopepla nitens*—phainopepla

### SWIFTS

#### ***APODIDAE—SWIFTS***

*Aeronautes saxatalis*—white-throated swift

### THRUSHES

#### ***TURDIDAE—THRUSHES***

*Turdus migratorius*—American robin

### WRENS

#### ***TROGLODYTIDAE—WRENS***

*Thryomanes bewickii*—Bewick's wren

### INVERTEBRATE

### BUTTERFLIES

#### ***LYCAENIDAE—BLUES, HAIRSTREAKS, AND COPPERS***

*Atlides halesus*—great purple hairstreak

*Callophrys gryneus*—juniper hairstreak

*Philotes sonorensis*—Sonoran blue

*Plebejus acmon*—Acmon blue

#### ***NYMPHALIDAE—BRUSH-FOOTED BUTTERFLIES***

*Chlosyne californica*—California patch

*Euphydryas chalcedona chalcedona*—Chalcedon variable checkerspot

*Vanessa cardui*—painted lady

## APPENDIX A (Continued)

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### **HESPERIIDAE—SKIPPERS**

*Erynnis funeralis*—funereal duskywing

### **PAPILIONIDAE—SWALLOWTAILS**

*Papilio polyxenes coloro*—desert black swallowtail

### **PIERIDAE—WHITES AND SULFURS**

*Anthocharis cethura*—desert orangetip

*Anthocharis sara sara*—Pacific sara orangetip

*Colias harfordii*—Harford's sulphur

*Euchloe hyantis lotta*—desert pearly marble

*Eurema nicippe*—sleepy orange

*Nathalis iole*—dainty sulphur

*Pontia protodice*—checkered white

## MAMMAL

### HARES AND RABBITS

#### **LEPORIDAE—HARES AND RABBITS**

*Lepus californicus bennettii*—San Diego black-tailed jackrabbit

*Lepus californicus*—black-tailed jackrabbit

## SQUIRRELS

#### **SCIURIDAE—SQUIRRELS**

*Spermophilus (Xerospermophilus) tereticaudus*—round-tailed ground squirrel

## REPTILE

### LIZARDS

#### **PHRYNOSOMATIDAE—IGUANID LIZARDS**

*Phrynosoma blainvillii*—Blainville's horned lizard

*Uta stansburiana*—common side-blotched lizard

#### **TEIIDAE—WHIPTAIL LIZARDS**

*Aspidoscelis tigris stejnegeri*—San Diegan tiger whiptail



## APPENDIX A (Continued)

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### SNAKES

#### ***COLUBRIDAE—COLUBRID SNAKES***

*Coluber flagellum*—coachwhip

#### ***BOIDAE—BOAS***

*Lichanura trivirgata*—rosy boa

## APPENDIX A (Continued)

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# **APPENDIX B**

*2016 Jacumba Solar Quino Survey Field Notes*



## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-02-21
Biologist(s)	Callie Ford, Erin Bergman
Survey Area	11
Survey Pass	1

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	08:21:00	72	70	0	2	clear	
End	14:28:00	79	77	0	1	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Saras orangetip (11)		

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
burrowing owl (1+)	black-throated sparrow (1+)	

INCIDENTAL PLANT LIST		
<i>Erodium cicutarium</i>	<i>Lomatium dasycarpum</i>	<i>Thamnosma montana</i>
<i>Larrea tridentata</i>	<i>Simmondsia chinensis</i>	

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-02-19
Biologist(s)	Erin Bergman
Survey Area	22
Survey Pass	1

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	10:35:00	79		20	3		
End	17:06:00	67		0	1	clear	

BUTTERFLY LIST SPECIES (COUNT)		
blue-gray gnatcatcher (1+)	painter lady (2)	
Great purple hairstreak (2)	Sarahs orangetip (12)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
bushtit (1+)	red-tailed hawk (1+)	
phainopepla (1+)	turkey vulture (1+)	

INCIDENTAL PLANT LIST		
<i>Phoradendron californicum</i>	<i>Simmondsia chinensis</i>	<i>Yucca schidigera</i>
<i>Purshia tridentata</i>	<i>Thamnosma montana</i>	

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-02-25
Biologist(s)	Erin Bergman, Marshall Paymard, Patricia Schuyler
Survey Area	1,21, 2
Survey Pass	2

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:19:00	78	75	0	2	clear	
End	16:24:00	85	82	0	3.5	clear	

BUTTERFLY LIST SPECIES (COUNT)		
California patch (1)	desert orangetip (10)	Orangetip spp. (1+)
Desert black swallowtail (2)	juniper hairstreak (4)	Saras orangetip (11)

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
<b>burrowing owl (1+)</b>	bushtit (1+)	turkey vulture (1+)
American robin (1+)	horned lark (1+)	western scrub-jay (1+)
black-throated sparrow (1+)	house finch (1+)	
Black tailed jackrabbit (3)	ruby-crowned kinglet (1+)	

INCIDENTAL PLANT LIST		
<i>Descurainia pinnata</i>	<i>Lomatium dasycarpum</i>	<i>Sisymbrium altissimum</i>
<i>Erodium cicutarium</i>	<i>Phoradendron californicum</i>	<i>Thamnosma montana</i>
<i>Larrea tridentata</i>	<i>Simmondsia chinensis</i>	<i>Ziziphus parryi</i>

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-03-06
Biologist(s)	Erin Bergman
Survey Area	1
Survey Pass	3

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:03:00	65	62	10	4.5	clear	Some wind but not sustained, just some gusts.
Weather check	10:23:00	62	60	30	4.5	patchy	
End	13:56:00	61	60	30	4.5	patchy	Supposed to rain later today.

BUTTERFLY LIST SPECIES (COUNT)		
desert orangetip (2)	Pacific sara orangetip (3)	White sp. (2)

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
Anna's hummingbird (1+)	bushtit (1+)	western scrub-jay (1+)
black-throated sparrow (1+)	phainopepla (1+)	

INCIDENTAL PLANT LIST		
<i>Amsinckia menziesii</i>	<i>Gutierrezia sarothrae</i>	<i>Phoradendron californicum</i>
<i>Descurainia pinnata ssp. glabra</i>	<i>Larrea tridentata</i>	<i>Simmondsia chinensis</i>
<i>Eriogonum fasciculatum var. polifolium</i>	<i>Lomatium dasycarpum</i>	<i>Thamnosma montana</i>
<i>Erodium cicutarium</i>	<i>Lycium andersonii</i>	<i>Ziziphus parryi</i>



## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-03-05
Biologist(s)	Erin Bergman
Survey Area	1, 2
Survey Pass	3

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Temp check	12:10:00	77	74	60	3.5	patchy	
Weather check	13:52:00	78	76	60	1.5	patchy	
End	17:28:00	72	70	40	1.5	patchy	
Start	19:33:00	66	64	30	2.5	clear	

BUTTERFLY LIST SPECIES (COUNT)		
desert orangetip (14)	juniper hairstreak (1)	painted lady (1)
desert pearly marble (1)	Orangetip sp. (7)	
funereal duskywing (8)	Pacific sara orangetip (17)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
black-throated sparrow (1+)	phainopepla (1+)	western scrub-jay (1+)
dark-eyed junco (1+)	red-tailed hawk (1+)	
horned lark (1+)	song sparrow (1+)	

INCIDENTAL PLANT LIST		
<i>Ambrosia salsola</i>	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Phoradendron californicum</i>
<i>Amsinckia menziesii</i>	<i>Erodium cicutarium</i>	<i>Purshia tridentata</i>
<i>Atriplex canescens</i>	<i>Euphorbia polycarpa</i>	<i>Simmondsia chinensis</i>
<i>Caulanthus lasiophyllus</i>	<i>Gutierrezia sarothrae</i>	<i>Thamnosma montana</i>
<i>Chenopodium californicum</i>	<i>Larrea tridentata</i>	<i>Yucca schidigera</i>
<i>Descurainia pinnata</i>	<i>Lomatium dasycarpum</i>	<i>Ziziphus parryi</i>
<i>Encelia actoni</i>	<i>Lycium andersonii</i>	

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-03-11
Biologist(s)	Erin Bergman
Survey Area	1, 2
Survey Pass	4

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Temp check	06:42:00	58.3	54.9	10	1.1	clear	
Start	08:24:00	66.3	60.1	30	1.0	clear	
Temp check	09:04:00	72.8	70.1	20	1.5	clear	
Weather check	09:40:00	83	79.4	30	1.1	clear	
End	15:46:00	67.6	62.4	30	2.4	clear	

BUTTERFLY LIST SPECIES (COUNT)		
California patch (2)	desert orangetip (9)	Pacific sara orangetip (17)
Chalcedon variable checkerspot (9)	desert pearly marble (3)	
checkered white (7)	juniper hairstreak (6)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
burrowing owl (1+)	horned lark (1+)	western scrub-jay (1+)
black-tailed jackrabbit (1+)	phainopepla (1+)	
black-throated sparrow (1+)	turkey vulture (1+)	

INCIDENTAL PLANT LIST		
<i>Ambrosia salsola</i> var. <i>salsola</i>	<i>Euphorbia albomarginata</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>
<i>Amsinckia menziesii</i>	<i>Euphorbia melanadenia</i>	<i>Phacelia cryptantha</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Gutierrezia californica</i>	<i>Phacelia distans</i>
<i>Atriplex canescens</i> var. <i>canescens</i>	<i>Gutierrezia sarothrae</i>	<i>Phoradendron californicum</i>
<i>Caulanthus lasiophyllus</i>	<i>Larrea tridentata</i>	<i>Purshia tridentata</i> var. <i>glandulosa</i>
<i>Chenopodium californicum</i>	<i>Lasthenia gracilis</i>	<i>Simmondsia chinensis</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Lomatium dasycarpum</i>	<i>Thamnosma montana</i>
<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Lomatium mohavense</i>	<i>Yucca schidigera</i>
<i>Erodium cicutarium</i>	<i>Lycium andersonii</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-03-13
Biologist(s)	Erin Bergman
Survey Area	2
Survey Pass	4

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	10:11:00	61.4		10	2.9	clear	
Temp check	13:24:00	73.3	70.1	0	1.8	clear	
End	17:34:00	61.8	60	10	1.4	clear	

BUTTERFLY LIST SPECIES (COUNT)		
California patch (1)	desert orangetip (5)	Pacific sara orangetip (3)
Chalcedon variable checkerspot (10)	Harford's sulphur (6)	White spp. (4)
checkered white (5)	juniper hairstreak (1)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
black-throated sparrow (1+)	turkey vulture (1+)	
phainopepla (1+)	western scrub-jay (1+)	

INCIDENTAL PLANT LIST		
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Gutierrezia californica</i>	<i>Simmondsia chinensis</i>
<i>Caulanthus lasiophyllus</i>	<i>Larrea tridentata</i>	<i>Sisymbrium altissimum</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Lasthenia gracilis</i>	<i>Thamnosma montana</i>
<i>Dudleya pulverulenta</i>	<i>Lomatium dasycarpum</i>	<i>Yucca schidigera</i>
<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Lycium andersonii</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>
<i>Erodium cicutarium</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>	
<i>Euphorbia albomarginata</i>	<i>Purshia tridentata</i> var. <i>glandulosa</i>	

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-03-22
Biologist(s)	Erin Bergman
Survey Area	1
Survey Pass	5

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	10:41:00	62.4		0	2.3	clear	Weather said it was a little cold in the morning so didn't start early.
Weather check	14:31:00	66.1		0	3.2	clear	
End	15:33:00	64.1		0	Too windy leaving site	clear	All of the sudden 25 plus mile and hour winds -will complete sat. Site 1

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (7)	juniper hairstreak (1)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
black-throated sparrow (1+)	turkey vulture (1+)	

INCIDENTAL PLANT LIST		
<i>Ambrosia salsola</i>	<i>Gutierrezia sarothrae</i>	<i>Simmondsia chinensis</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Larrea tridentata</i>	<i>Sisymbrium altissimum</i>
<i>Caulanthus lasiophyllus</i>	<i>Lasthenia gracilis</i>	<i>Thamnosma montana</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Lycium andersonii</i>	<i>Yucca schidigera</i>
<i>Erodium cicutarium</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>
<i>Euphorbia albomarginata</i>	<i>Phoradendron californicum</i>	<i>Geraea viscida</i>

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-03-26
Biologist(s)	Erin Bergman
Survey Area	1
Survey Pass	5

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Temp check	08:16:00	57.9		0	1.1	clear	Still too cold
Temp check	09:05:00	58.7		0	0.3	clear	Still cold
Start	11:04:00	61.4		0	1.1	clear	
Temp check	12:08:00	72.8		0	1.6	clear	
End	15:49:00	73.7		0	1.3	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (1)	juniper hairstreak (3)	White spp. (1+)
desert orangetip (2)	Pacific sara orangetip (10)	
funereal duskywing (2)	sleepy orange (2)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
American crow (1+)	chipping sparrow (1+)	white-crowned sparrow (1+)
black-throated sparrow (1+)	northern mockingbird (1+)	
bushtit (1+)	turkey vulture (1+)	

INCIDENTAL PLANT LIST		
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Gutierrezia sarothrae</i>	<i>Pectocarya penicillata</i>
<i>Caulanthus lasiophyllus</i>	<i>Larrea tridentata</i>	<i>Pectocarya recurvata</i>
<i>Chenopodium californicum</i>	<i>Lasthenia gracilis</i>	<i>Phacelia distans</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Layia platyglossa</i>	<i>Thamnosma montana</i>
<i>Ericameria linearifolia</i>	<i>Lomatium mohavense</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>
<i>Erodium cicutarium</i>	<i>Lycium andersonii</i>	<b><i>Geraea viscida</i></b>
<i>Euphorbia albomarginata</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>	

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-03-21
Biologist(s)	Erin Bergman
Survey Area	1, 2
Survey Pass	5

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	08:57:00	66.2	68.1	10	1.9	clear	
Temp check	11:35:00	73.9	75.2	0	1.7	clear	
End	16:27:00	70.3	73.2	0	1.8	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (8)	desert orangetip (3)	juniper hairstreak (1)
checkered white (3)	funereal duskywing (1)	Pacific sara orangetip (4)

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
black-throated sparrow (1+)	turkey vulture (1+)	

INCIDENTAL PLANT LIST		
<i>Ambrosia salsola</i> var. <i>salsola</i>	<i>Ericameria linearifolia</i>	<i>Lycium andersonii</i>
<i>Amsinckia tessellata</i>	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Erodium cicutarium</i>	<i>Pectocarya setosa</i>
<i>Atriplex canescens</i> var. <i>canescens</i>	<i>Euphorbia albomarginata</i>	<i>Phoradendron californicum</i>
<i>Caulanthus lasiophyllus</i>	<i>Gutierrezia sarothrae</i>	<i>Purshia tridentata</i> var. <i>glandulosa</i>
<i>Chenopodium californicum</i>	<i>Larrea tridentata</i>	<i>Simmondsia chinensis</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Lasthenia gracilis</i>	<i>Yucca schidigera</i>
<i>Encelia actoni</i>	<i>Lomatium mohavense</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-02
Biologist(s)	Erin Bergman
Survey Area	1
Survey Pass	6

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:07:00	63.4		0	2.3	clear	
Temp check	10:46:00	78.2		0	2.2	clear	
End	16:34:00	78.9		0	2.4	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (6)	juniper hairstreak (11)	White spp. (19)
desert orangetip (1)	Pacific sara orangetip (9)	
desert pearly marble (7)	Sulphur spp. (7)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
black-throated sparrow (1+)	house finch (1+)	turkey vulture (1+)
chipping sparrow (1+)	northern mockingbird (1+)	western scrub-jay (1+)
horned lark (1+)	phainopepla (1+)	

INCIDENTAL PLANT LIST		
<i>Acmispon strigosus</i>	<i>Ericameria linearifolia</i>	<i>Mentzelia veatchiana</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Erodium cicutarium</i>	<i>Pectocarya penicillata</i>
<i>Anisocoma acaulis</i>	<i>Euphorbia albomarginata</i>	<i>Senegalia greggii</i>
<i>Atriplex canescens</i> var. <i>canescens</i>	<i>Gutierrezia californica</i>	<i>Simmondsia chinensis</i>
<i>Brickellia frutescens</i>	<i>Gutierrezia sarothrae</i>	<i>Thamnosma montana</i>
<i>Caulanthus lasiophyllus</i>	<i>Larrea tridentata</i>	<i>Yucca schidigera</i>
<i>Chaenactis fremontii</i>	<i>Lasthenia gracilis</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>
<i>Chenopodium album</i>	<i>Lycium andersonii</i>	
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Malacothamnus densiflorus</i>	

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-01
Biologist(s)	Erin Bergman
Survey Area	2
Survey Pass	6

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:33:00	62.5		0	3.1	clear	
Temp check	11:35:00	71.3		0	1.2	clear	
Temp check	15:20:00	78.2		0	1.8	clear	
End	16:29:00	77.6		0	2.6	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (35)	funereal duskywing (1)	Sonoran blue (1)
checkered white (2)	Harford's sulphur (1)	White spp. (18)
desert orangetip (1)	juniper hairstreak (7)	
desert pearly marble (16)	Pacific sara orangetip (6)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
<b>Brewer's sparrow (1+)</b>	black-throated sparrow (1+)	horned lark (1+)
<b>burrowing owl (1+)</b>	chipping sparrow (1+)	phainopepla (1+)
black-tailed jackrabbit (1)	common raven (1+)	turkey vulture (1+)

INCIDENTAL PLANT LIST		
<i>Acmispon brachycarpus</i>	<i>Dichelostemma capitatum</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>
<i>Acmispon glaber</i> var. <i>glaber</i>	<i>Dudleya arizonica</i>	<i>Pectocarya penicillata</i>
<i>Acmispon strigosus</i>	<i>Ericameria linearifolia</i>	<i>Pectocarya recurvata</i>
<i>Agave deserti</i>	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Pectocarya setosa</i>
<i>Ambrosia salsola</i> var. <i>salsola</i>	<i>Erodium cicutarium</i>	<i>Phacelia distans</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Euphorbia albomarginata</i>	<i>Purshia tridentata</i>
<i>Anisocoma acaulis</i>	<i>Gutierrezia sarothrae</i>	<i>Senegalia greggii</i>
<i>Atriplex canescens</i> var. <i>canescens</i>	<i>Larrea tridentata</i>	<i>Simmondsia chinensis</i>
<i>Brickellia frutescens</i>	<i>Lasthenia gracilis</i>	<i>Sisymbrium altissimum</i>



INCIDENTAL PLANT LIST		
<i>Caulanthus lasiophyllus</i>	<i>Lycium andersonii</i>	<i>Sisymbrium irio</i>
<i>Chaenactis fremontii</i>	<i>Malacothamnus densiflorus</i>	<i>Stylocline gnaphaloides</i>
<i>Chaenactis glabriuscula</i> var. <i>glabriuscula</i>	<i>Malacothrix glabrata</i>	<i>Thamnosma montana</i>
<i>Chenopodium californicum</i>	<i>Mammillaria tetrancistra</i>	<i>Yucca schidigera</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Mentzelia veatchiana</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-13
Biologist(s)	Erin Bergman
Survey Area	1
Survey Pass	7

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Temp check	08:17:00	55.9		30	1.9	clear	
Start	09:09:00	60.2		10	1.6	clear	
Temp check	11:18:00	72.7		0	1.1	clear	
Temp check	12:48:00	76.4		0	2.6	clear	
End	16:52:00	70.1		0	1.4	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (1)	desert pearly marble (7)	Pacific sara orangetip (5)
desert orangetip (2)	Orangetip spp. (7)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
black-throated sparrow (1+)	northern mockingbird (1+)	western scrub-jay (1+)
chipping sparrow (1+)	phainopepla (1+)	
common raven (1+)	turkey vulture (1+)	

INCIDENTAL PLANT LIST		
<i>Acmispon brachycarpus</i>	<i>Euphorbia albomarginata</i>	<i>Pectocarya recurvata</i>
<i>Acmispon glaber</i> var. <i>brevialatus</i>	<i>Gutierrezia californica</i>	<i>Phacelia distans</i>
<i>Allium fimbriatum</i> var. <i>fimbriatum</i>	<i>Gutierrezia sarothrae</i>	<i>Phoradendron bolleanum</i>
<i>Ambrosia salsola</i> var. <i>salsola</i>	<i>Hirschfeldia incana</i>	<i>Phoradendron californicum</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Larrea tridentata</i>	<i>Purshia tridentata</i> var. <i>glandulosa</i>
<i>Astragalus palmeri</i>	<i>Lasthenia gracilis</i>	<i>Salvia columbariae</i>
<i>Caulanthus lasiophyllus</i>	<i>Lepidium lasiocarpum</i> ssp. <i>lasiocarpum</i>	<i>Simmondsia chinensis</i>
<i>Chenopodium californicum</i>	<i>Leptosiphon lemmonii</i>	<i>Sisymbrium altissimum</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Lomatium mohavense</i>	<i>Sphaeralcea ambigua</i> var. <i>rosacea</i>

INCIDENTAL PLANT LIST		
<i>Dichelostemma capitatum</i> ssp. <i>pauciflorum</i>	<i>Lupinus concinnus</i>	<i>Stephanomeria pauciflora</i>
<i>Eriastrum densifolium</i>	<i>Lycium andersonii</i>	<i>Stylocline gnaphaloides</i>
<i>Eriastrum eremicum</i> ssp. <i>eremicum</i>	<i>Mentzelia montana</i>	<i>Thamnosma montana</i>
<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Mentzelia veatchiana</i>	<i>Yucca schidigera</i>
<i>Erodium cicutarium</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>
<i>Eucrypta chrysanthemifolia</i> var. <i>bipinnatifida</i>	<i>Pectocarya linearis</i> ssp. <i>ferocula</i>	<b><i>Geraea viscida</i></b>

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-08
Biologist(s)	Erin Bergman, Janice Wondolleck
Survey Area	2
Survey Pass	7

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Temp check	09:50:00	55.1		100	2.8	drizzle	
End	10:15:00	55		100	3.7	drizzle	

BUTTERFLY LIST <i>SPECIES (COUNT)</i>		
(none)		

INCIDENTAL WILDLIFE LIST <i>SPECIES (COUNT)</i>		
(none)		

INCIDENTAL PLANT LIST		
(none)		

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-12
Biologist(s)	Erin Bergman
Survey Area	2
Survey Pass	7

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:07:00	63.7		20	2.8	clear	
Temp check	12:09:00	69.4		0	1.1	clear	
End	16:56:00	73.6		30	3.3	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (14)	desert pearly marble (8)	Pacific sara orangetip (10)
desert black swallowtail (1)	juniper hairstreak (1)	Sulphur spp. (3)
desert orangetip (2)	Orangetip spp. (1+)	White spp. (1+)

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
black-throated sparrow (1+)	common raven (1+)	turkey vulture (1+)
chipping sparrow (1+)	phainopepla (1+)	western scrub-jay (1+)

INCIDENTAL PLANT LIST		
<i>Acmispon brachycarpus</i>	<i>Ericameria linearifolia</i>	<i>Pectocarya penicillata</i>
<i>Acmispon glaber</i> var. <i>brevialatus</i>	<i>Eriogonum elongatum</i> var. <i>elongatum</i>	<i>Pectocarya recurvata</i>
<i>Acmispon strigosus</i>	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Pectocarya setosa</i>
<i>Agave deserti</i>	<i>Erodium cicutarium</i>	<i>Phacelia distans</i>
<i>Allium fimbriatum</i> var. <i>fimbriatum</i>	<i>Euphorbia albomarginata</i>	<i>Phoradendron bolleanum</i>
<i>Ambrosia salsola</i> var. <i>salsola</i>	<i>Gutierrezia californica</i>	<i>Phoradendron californicum</i>
<i>Amsinckia lycopsoides</i>	<i>Gutierrezia sarothrae</i>	<i>Plantago erecta</i>
<i>Amsinckia menziesii</i>	<i>Hesperoyucca whipplei</i>	<i>Purshia tridentata</i> var. <i>tridentata</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Hirschfeldia incana</i>	<i>Salvia columbariae</i>
<i>Anisocoma acaulis</i>	<i>Krameria erecta</i>	<i>Senegalia greggii</i>
<i>Atriplex canescens</i> var. <i>canescens</i>	<i>Larrea tridentata</i>	<i>Simmondsia chinensis</i>
<i>Brickellia frutescens</i>	<i>Lasthenia gracilis</i>	<i>Sisymbrium altissimum</i>

INCIDENTAL PLANT LIST		
<i>Caulanthus lasiophyllus</i>	<i>Layia glandulosa</i>	<i>Sisymbrium irio</i>
<i>Chaenactis fremontii</i>	<i>Layia platyglossa</i>	<i>Sisymbrium orientale</i>
<i>Chenopodium californicum</i>	<i>Leptosiphon lemmonii</i>	<i>Sphaeralcea ambigua</i> var. <i>rosacea</i>
<i>Cryptantha nevadensis</i> var. <i>rigida</i>	<i>Lycium andersonii</i>	<i>Sphaeralcea angustifolia</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Malacothrix glabrata</i>	<i>Stylocline gnaphaloides</i>
<i>Descurainia sophia</i>	<i>Mammillaria tetrancistra</i>	<i>Stylocline micropoides</i>
<i>Dichelostemma capitatum</i>	<i>Mentzelia veatchiana</i>	<i>Thamnosma montana</i>
<i>Dudleya arizonica</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>	<i>Yucca schidigera</i>
<i>Encelia actoni</i>	<i>Pectocarya linearis</i> ssp. <i>ferocula</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-17
Biologist(s)	Erin Bergman
Survey Area	1
Survey Pass	8

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:02:00	76.3		10	1.2	clear	
Temp check	14:22:00	83.1		0	3.7	clear	
End	17:05:00	78.1		0	1.1	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (3)	desert pearly marble (6)	Pacific sara orangetip (4)
desert orangetip (8)	Orangetip spp. (11)	sleepy orange (3)

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
ash-throated flycatcher (1+)	common raven (1+)	
chipping sparrow (1+)	northern mockingbird (1+)	

INCIDENTAL PLANT LIST		
<i>Acmispon brachycarpus</i>	<i>Eucrypta chrysanthemifolia</i> var. <i>bipinnatifida</i>	<i>Phacelia distans</i>
<i>Acmispon glaber</i> var. <i>brevialatus</i>	<i>Euphorbia albomarginata</i>	<i>Phoradendron bolleanum</i>
<i>Agave deserti</i> var. <i>deserti</i>	<i>Gutierrezia californica</i>	<i>Phoradendron californicum</i>
<i>Allium fimbriatum</i> var. <i>fimbriatum</i>	<i>Gutierrezia sarothrae</i>	<i>Purshia tridentata</i> var. <i>glandulosa</i>
<i>Ambrosia salsola</i> var. <i>salsola</i>	<i>Hesperoyucca whipplei</i>	<i>Salvia columbariae</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Hirschfeldia incana</i>	<i>Senegalia greggii</i>
<i>Anisocoma acaulis</i>	<i>Larrea tridentata</i>	<i>Simmondsia chinensis</i>
<i>Astragalus didymocarpus</i>	<i>Lasthenia gracilis</i>	<i>Sisymbrium altissimum</i>
<i>Astragalus palmeri</i>	<i>Lepidium lasiocarpum</i> ssp. <i>lasiocarpum</i>	<i>Sisymbrium irio</i>
<i>Caulanthus lasiophyllus</i>	<i>Lomatium mohavense</i>	<i>Sisymbrium orientale</i>
<i>Chenopodium californicum</i>	<i>Lupinus concinnus</i>	<i>Sphaeralcea ambigua</i> var. <i>rosacea</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Lycium andersonii</i>	<i>Stephanomeria pauciflora</i>

INCIDENTAL PLANT LIST		
<i>Dichelostemma capitatum</i> ssp. <i>pauciflorum</i>	<i>Mentzelia montana</i>	<i>Stylocline gnaphaloides</i>
<i>Eriastrum densifolium</i> ssp. <i>elongatum</i>	<i>Mentzelia veatchiana</i>	<i>Thamnosma montana</i>
<i>Eriastrum eremicum</i> ssp. <i>eremicum</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>	<i>Yucca schidigera</i>
<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Pectocarya linearis</i> ssp. <i>ferocula</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>
<i>Eriogonum thurberi</i>	<i>Pectocarya recurvata</i>	<b><i>Geraea viscida</i></b>
<i>Erodium cicutarium</i>	<i>Pectocarya setosa</i>	



## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-16
Biologist(s)	Erin Bergman
Survey Area	2
Survey Pass	8

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	10:29:00	76.3		0	2.6	clear	
Temp check	13:18:00	80.1		0	1.6	clear	
End	17:12:00	76.3		0	4.2	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (14)	Harford's sulphur (2)	sleepy orange (3)
dainty sulphur (1)	juniper hairstreak (1)	Sulphur spp. (3)
desert orangetip (4)	Orangetip spp. (5)	
desert pearly marble (6)	Pacific sara orangetip (2)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
black-throated sparrow (1+)	northern mockingbird (1+)	turkey vulture (1+)
chipping sparrow (1+)	phainopepla (1+)	

INCIDENTAL PLANT LIST		
<i>Acmispon brachycarpus</i>	<i>Ericameria linearifolia</i>	<i>Mentzelia veatchiana</i>
<i>Acmispon glaber</i> var. <i>brevialatus</i>	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>
<i>Agave deserti</i> var. <i>deserti</i>	<i>Erodium cicutarium</i>	<i>Pectocarya linearis</i> ssp. <i>ferocula</i>
<i>Allium fimbriatum</i> var. <i>fimbriatum</i>	<i>Eucrypta chrysanthemifolia</i> var. <i>bipinnatifida</i>	<i>Pectocarya recurvata</i>
<i>Ambrosia salsola</i> var. <i>salsola</i>	<i>Eulobus californicus</i>	<i>Pectocarya setosa</i>
<i>Amsinckia lycopsoides</i>	<i>Euphorbia albomarginata</i>	<i>Phacelia distans</i>
<i>Amsinckia tessellata</i> var. <i>tessellata</i>	<i>Gilia stellata</i>	<i>Phoradendron bolleanum</i>
<i>Anisocoma acaulis</i>	<i>Gutierrezia californica</i>	<i>Phoradendron californicum</i>
<i>Astragalus didymocarpus</i> var. <i>obispoensis</i>	<i>Gutierrezia sarothrae</i>	<i>Plantago erecta</i>
<i>Atriplex canescens</i>	<i>Hesperoyucca whipplei</i>	<i>Purshia tridentata</i> var. <i>glandulosa</i>

INCIDENTAL PLANT LIST		
<i>Brickellia frutescens</i>	<i>Hirschfeldia incana</i>	<i>Salvia columbariae</i>
<i>Caulanthus lasiophyllus</i>	<i>Krameria erecta</i>	<i>Senegalia greggii</i>
<i>Chaenactis fremontii</i>	<i>Larrea tridentata</i>	<i>Simmondsia chinensis</i>
<i>Chenopodium californicum</i>	<i>Lasthenia gracilis</i>	<i>Sisymbrium altissimum</i>
<i>Cryptantha nevadensis</i> var. <i>rigida</i>	<i>Layia glandulosa</i>	<i>Sisymbrium irio</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Layia platyglossa</i>	<i>Sphaeralcea ambigua</i> var. <i>rosacea</i>
<i>Descurainia sophia</i>	<i>Lepidium lasiocarpum</i> ssp. <i>lasiocarpum</i>	<i>Stylocline gnaphaloides</i>
<i>Dichelostemma capitatum</i> ssp. <i>pauciflorum</i>	<i>Leptosiphon lemmonii</i>	<i>Thamnosma montana</i>
<i>Dudleya arizonica</i>	<i>Lycium andersonii</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>
<i>Encelia actoni</i>	<i>Mammillaria tetrancistra</i>	

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-23
Biologist(s)	Erin Bergman
Survey Area	1
Survey Pass	9

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	08:29:00	66.4		0	1.1	clear	
End	17:14:00	70.2		0	2.1	clear	

BUTTERFLY LIST <i>SPECIES (COUNT)</i>		
Chalcedon variable checkerspot (1+)	desert orangetip (1+)	Pacific sara orangetip (1+)
dainty sulphur (1+)	Orangetip spp. (1+)	

INCIDENTAL WILDLIFE LIST <i>SPECIES (COUNT)</i>		
chipping sparrow (1+)	phainopepla (1+)	western scrub-jay (1+)
northern mockingbird (1+)	turkey vulture (1+)	

INCIDENTAL PLANT LIST		
<i>(none)</i>		

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-22
Biologist(s)	Erin Bergman, Marshall Paymard
Survey Area	2
Survey Pass	9

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	08:50:00	79.4		0	1.2	clear	
End	19:46:00	75.8		0	3.7	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Acmon blue (1)	desert black swallowtail (1)	Harford's sulphur (1)
Chalcedon variable checkerspot (2)	desert orangetip (3)	Orangetip spp. (9)
dainty sulphur (1)	desert pearly marble (3)	Pacific sara orangetip (4)

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
Bewick's wren (1+)	chipping sparrow (1+)	horned lark (1+)
black-throated sparrow (1+)	common raven (1+)	

INCIDENTAL PLANT LIST		
<i>Acmispon brachycarpus</i>	<i>Eriogonum thurberi</i>	<i>Mirabilis laevis</i> var. <i>villosa</i>
<i>Acmispon glaber</i> var. <i>brevialatus</i>	<i>Eriophyllum wallacei</i>	<i>Pectocarya setosa</i>
<i>Agave deserti</i> var. <i>deserti</i>	<i>Erodium cicutarium</i>	<i>Phacelia distans</i>
<i>Ambrosia salsola</i> var. <i>salsola</i>	<i>Eschscholzia minutiflora</i>	<i>Phoradendron bolleanum</i>
<i>Astragalus didymocarpus</i> var. <i>obispoensis</i>	<i>Eulobus californicus</i>	<i>Purshia tridentata</i> var. <i>glandulosa</i>
<i>Astragalus palmeri</i>	<i>Euphorbia albomarginata</i>	<i>Senegalia greggii</i>
<i>Brickellia frutescens</i>	<i>Hesperoyucca whipplei</i>	<i>Simmondsia chinensis</i>
<i>Calochortus splendens</i>	<i>Krameria erecta</i>	<i>Sisymbrium altissimum</i>
<i>Chaenactis fremontii</i>	<i>Larrea tridentata</i>	<i>Sisymbrium orientale</i>
<i>Chenopodium californicum</i>	<i>Lasthenia gracilis</i>	<i>Sphaeralcea ambigua</i> var. <i>rosacea</i>
<i>Descurainia pinnata</i> ssp. <i>glabra</i>	<i>Layia platyglossa</i>	<i>Stephanomeria exigua</i>
<i>Dudleya arizonica</i>	<i>Lepidium lasiocarpum</i> ssp. <i>lasiocarpum</i>	<i>Stylocline gnaphaloides</i>
<i>Echinocereus engelmannii</i>	<i>Lycium andersonii</i>	<i>Thamnosma montana</i>

INCIDENTAL PLANT LIST		
<i>Encelia actoni</i>	<i>Malacothrix glabrata</i>	<i>Yucca schidigera</i>
<i>Eriastrum densifolium</i> ssp. <i>elongatum</i>	<i>Mammillaria tetrancistra</i>	<i>Ziziphus parryi</i> var. <i>parryi</i>
<i>Ericameria linearifolia</i>	<i>Mentzelia montana</i>	<b><i>Geraea viscida</i></b>
<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	<i>Mentzelia veatchiana</i>	<b><i>Harpagonella palmeri</i></b>

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-04-29
Biologist(s)	Erin Bergman
Survey Area	1, 2
Survey Pass	10

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:07:00	52.7		0	1.5	clear	
Start	09:27:00	60.1		0	1.5	clear	
End	16:10:00	72		0	1.5	clear	

BUTTERFLY LIST <i>SPECIES (COUNT)</i>		
Acmon blue (1)	desert black swallowtail (1)	Pacific sara orangetip (2)
Chalcedon variable checkerspot (1)	desert pearly marble (9)	

INCIDENTAL WILDLIFE LIST <i>SPECIES (COUNT)</i>		
<b>San Diego black-tailed jackrabbit (1+)</b>	hooded oriole (1+)	phainopepla (1+)
black-throated sparrow (1+)	horned lark (1+)	rosy boa (1+)
chipping sparrow (1+)	house finch (1+)	turkey vulture (1+)
great horned owl (1+)	northern mockingbird (1+)	

INCIDENTAL PLANT LIST		
<i>Geraea viscida</i>		

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-05-01
Biologist(s)	Erin Bergman
Survey Area	2
Survey Pass	10

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:42:00	62.3		10	2.6	clear	
Temp check	13:07:00	74.8		0	2.4	clear	
End	16:19:00	74.3		0	1.8	clear	

BUTTERFLY LIST SPECIES (COUNT)		
Chalcedon variable checkerspot (1+)	desert orangetip (1+)	Orangetip spp. (1+)
dainty sulphur (1+)	desert pearly marble (1+)	Pacific sara orangetip (1+)
desert black swallowtail (1+)	Harford's sulphur (1+)	

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
ash-throated flycatcher (1+)	house finch (1+)	turkey vulture (1+)
black-throated sparrow (1+)	northern mockingbird (1+)	
hooded oriole (1+)	phainopepla (1+)	

INCIDENTAL PLANT LIST		
<i>Chorizanthe brevicornu</i> var. <i>brevicornu</i>		

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-05-08
Biologist(s)	Erin Bergman, Marshall Paymard
Survey Area	1
Survey Pass	11

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	09:23:00	65.7		20	1.4	clear	
End	16:05:00	69.5		10	1.7	clear	

BUTTERFLY LIST <i>SPECIES (COUNT)</i>		
desert pearly marble (3)		

INCIDENTAL WILDLIFE LIST <i>SPECIES (COUNT)</i>		
<b>Blainville's horned lizard (1+)</b>	chipping sparrow (1+)	phainopepla (1+)
black-tailed jackrabbit (1+)	coachwhip (1+)	turkey vulture (1+)
bushtit (1+)	northern mockingbird (1+)	white-throated swift (1+)

INCIDENTAL PLANT LIST		
<i>Ericameria nauseosa</i>		



## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-05-05
Biologist(s)	Erin Bergman
Survey Area	2
Survey Pass	11

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Temp check	12:37:00	68.9		20	2.6	clear	
End	16:37:00	61.3		10	3.6	clear	
Start	21:51:00	63.7		20	1.8	clear	

BUTTERFLY LIST <i>SPECIES (COUNT)</i>		
Chalcedon variable checkerspot (1)	desert orangetip (1+)	
desert black swallowtail (1)	desert pearly marble (1+)	

INCIDENTAL WILDLIFE LIST <i>SPECIES (COUNT)</i>		
ash-throated flycatcher (1+)	hooded oriole (1+)	phainopepla (1+)
black-throated sparrow (1+)	house finch (1+)	round-tailed ground squirrel (1+)
common raven (1+)	northern mockingbird (1+)	

INCIDENTAL PLANT LIST		
<i>Ericameria brachylepis</i>	<i>Ericameria cuneata</i> var. <i>spathulata</i>	

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-05-13
Biologist(s)	Callie Ford
Survey Area	1
Survey Pass	12

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	10:30:00	76	78	0	3.1	clear	
End	16:39:00	78	80	10	2.0	clear	

BUTTERFLY LIST <i>SPECIES (COUNT)</i>		
desert pearly marble (6)	Harford's sulphur (3)	San Diegan tiger whiptail (1+)

INCIDENTAL WILDLIFE LIST <i>SPECIES (COUNT)</i>		
<b>San Diego black-tailed jackrabbit (1+)</b>	black-throated sparrow (1+)	lark sparrow (1+)
ash-throated flycatcher (1+)	common side-blotched lizard (1+)	phainopepla (1+)

INCIDENTAL PLANT LIST		
(none)		

## Quino Checkerspot Butterfly Survey Data Form

GENERAL SURVEY INFORMATION	
Project Name	Jacumba
Survey Date	2016-05-13
Biologist(s)	Erin Bergman
Survey Area	2
Survey Pass	12

SURVEY CONDITIONS							
Status	Time	Air Temp. (F)	Ground Temp. (F)	Cloud Cover (%)	Wind (mph)	Sky	Notes
Start	10:25:00	76		0	3.1	clear	
End	16:49:00	78		10	2.0	clear	

BUTTERFLY LIST SPECIES (COUNT)		
California patch (1+)	desert pearly marble (3)	San Diegan tiger whiptail (1+)

INCIDENTAL WILDLIFE LIST SPECIES (COUNT)		
Anna's hummingbird (1+)	black-throated sparrow (1+)	phainopepla (1+)
ash-throated flycatcher (1+)	lesser nighthawk (1+)	turkey vulture (1+)
black-tailed jackrabbit (1+)	northern mockingbird (1+)	

INCIDENTAL PLANT LIST		
<i>Plantago erecta</i>		

