

Quino Checkerspot General Form

Survey type: Habitat Assessment/Adult Survey

Surveyor: RIGGAN Date: 04/17/99 Site Visit No: 1 2 3 4 5 6 7 8 9 10Total site acres: 250 Site Name: Sunroad Site Location: Otey Mesa

Time (24 hr)	Sky	Wind (Beaufort)	Temp F or C
Begin <u>1330</u>	<u>clear</u> /partcloudy/overcast/fog/drizzle/shower	<1 1-3 <u>4-7</u> 8-12 >12	<u>87.2</u>
	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
End <u>1500</u>	<u>clear</u> /partcloudy/overcast/fog/drizzle/shower	<1 1-3 <u>4-7</u> 8-12 >12	<u>±86</u>

Total hours surveyed: 1.5Focused Survey Acres: <40 Elev Min: 600 ft Max: 625 ft

Describe, map, and estimate areas surveyed below.

Host Plants ^a	Patch Size (ft ²)	No Plants/ft ²	Sparse/Dense ^b	Map ID ^c	
<u>none</u>					

a. Larval or nectar resources. Identify species.

b. Sparse = plants not touching; dense = plants touching

c. Corresponds to polygon on a map.

Surrounding land uses (including adjoining properties):

North vacant/prisonDistance ft./mile → variableSouth agriculture/industrialDistance ft./mile → "East vacant/agricultureDistance ft./mile → "West vacant/agricultureDistance ft./mile → variableHabitat onsite (circle): open soils hilltop ridge Plantago Castilleja soil crusts old roadsnectar clay soils rock outcropsConditions: (e.g., grazing agriculture sowbugs/earwigs recent fire grading)Other: see field notes

Quino Checkerspot Butterfly Report, 2001

Report of a Protocol Survey for the Quino Checkerspot Butterfly over the Sunroad Centrum Property, Otay Mesa San Diego County, California

Prepared For:

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**11 June 2009
RBR File Number 1825 EDC**

Report of a Protocol Survey for the Quino Checkerspot Butterfly Over the Sunroad Centrum Property, Otay Mesa, San Diego County, California

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11 June 2001
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Executive Summary

The Quino Checkerspot Butterfly (*Euphydryas editha quino*) is listed under the Federal Endangered Species Act (ESA) as an endangered species. Prior to construction that might adversely affect potentially occupied habitats, surveys are mandated so as to prevent a "take." The proposed Sunroad Centrum Property is located within the "mandatory" survey area established by the Federal Year 2000 Survey Protocols (Fish and Wildlife Service, 2000). A survey to determine the presence or absence of the species has been required, therefore, by the County of San Diego to meet the requirements of the CEQA (California Environmental Quality Act) documentation for the proposed project.

The protocol survey identified an extremely limited, low density, localized population of *Plantago erecta*, the primary food plant utilized by the Quino larvae, and it located two hilltopping locations utilized by other species of butterflies. The survey did not, however, locate either adults or larvae of the Quino Checkerspot Butterfly. Despite the presence of the small *Plantago* population, no Quino were observed and it is concluded that the property is not occupied by that Federally listed species.

Other Lepidoptera were identified during the course of the field survey and these are listed and discussed in detail in the following material. Certain other field observations relative to other biological resources on the site are detailed in the attached Field Notes. Butterflies found within the bounds of the site were consistent with the habitats present and/or in the immediate vicinity. Implementation of the proposed development will not affect populations of the Quino Checkerspot Butterfly. Absent any significant effect, no mitigation measures are required and none are recommended.

I. Introduction

The Quino Checkerspot Butterfly (*Euphydryas editha quino*) is a small, colorful, spring flying, butterfly listed under the Federal Endangered Species Act (ESA) as an endangered subspecies. Thought to be extinct in 1995, a small population was found in Riverside County in 1996 and the subspecies was listed as endangered in 1997 (Fish and Wildlife Service). Surveys in 1997-2000 have identified three disjunct populations of the subspecies: one in the Lake Skinner area of Riverside County, one in the Otay Mountain area of San Diego County, and one in the Jacumba area of San Diego County.

The Quino Checkerspot Butterfly (*Euphydryas editha quino*) is best thought of as a "two phase" animal. The larvae are obligate feeders on one (two? three?) food plants: Dot-seed Plantain (*Plantago erecta*); perhaps Owl's Clover (*Castilleja exserta*); and possibly on other members of the Scrophulariaceae family. The presence or absence of these food plants is usually sufficient to determine the presence or absence of the larvae on a given site. The second "phase" is the adult butterfly. The males of the species exhibit what is referred to as "hilltopping" behavior. They fly to

prominent topographical points where they congregate, hours each day inspecting each butterfly that passes by, hoping to find a receptive female Quino.

Surveys for the Quino focus on populations of the larval food plants and on topographic high points where butterflies are observed (exhibiting reproductive) breeding behavior. Portions of a given property that are not suitable, such as the extensive Mustard fields over 170 acres of this 250-acre property, are excluded from a survey effort under the current spending rent protocols (Fish and Wildlife Service, 2000).

Only limited populations of the Dot-seed Plantain and other species known to be utilized by the Quino Checkerspot were found on the Sunroad site. However, extensive *Plantago/Castilleja* stands are known to occur to the west of this property and the Quino has been sighted both to the west (in the SR 125 corridor) and to the north of this property (north of Otay Lake on the Otay Ranch). In that there are known to be Quino is the general vicinity of the property and in that the Otay Mesa was historically occupied by extensive populations of the species (Murphy and White, 1984), it was felt that a federal protocol survey for the species was warranted. The species was, however, not found.

II. Project Location and Description

The Sunroad Centrum Property is located in the extreme southwestern part of the County of San Diego, east of Brown Field, near the east edge of the Otay Mesa (see Figures 1 and 2), but outside of the San Diego City Corporate Boundary. The site is characterized by a series of low rolling hills topographically above the primary mesa itself and at the southwestern edge of Johnson Canyon.

The geological formation underlying the entire site is mapped as "Otay Formation" by Kennedy and Tan (1977). However, the higher elevation parts of the site (especially the mima mound area) are characterized by numerous cobbles and small boulders derived from the Santiago Peak Metavolcanics, the country rock underlying Otay Mountain. This member of the Otay Formation appears, therefore, to be derived in part (if not wholly) from slope wash and colluvium from the mountains to the east. Around the periphery of the mima mound area are scattered piles of these cobbles and boulders. A few of the piles are on the order of ten by 20 feet (or greater) and are typically one to two feet above the immediately adjacent terrain. These seem to be set into depressions, rock only (no soil filler) extends below the level of the surrounding ground surface in many of the piles. It is assumed that these piles were created actinically by field workers clearing the cobbles and boulders from the adjacent fields (which have been ploughed and/or disced).

Surficial soils mapped on the property are illustrated in Figure 3 and include the following (Bowman, et al., 1973):

- Diablo Clay — these soils are well-drained, moderately deep to deep clays derived from soft, calcareous sandstone and shale. On-site they occupy the bulk of the lower 200 acres and roughly half of the upper 50 acres. The surface layer is mildly alkaline clay, about 27 inches

thick.

- Salinas Clay — this soil has a surface layer of clay and a substratum of clay to clay loam. On-site it occupies two small (approximately 10 acres) fingers along the southern boundary.
- Stockpen Gravelly Clay Loam — this soil is located on marine terraces. Mima mounds are typical in undisturbed areas of this soil type. On-site it occupies the central portion where the “pond” exists.
- Linne Clay Loam — this soil consists of well-drained, moderately deep clay loams derived from soft calcareous sandstone and shale. The surface layer is moderately alkaline, about 15 inches thick. On-site, it occupies a small corner in the northwestern section of the property.

The development plan for the property encompasses all but the north-central part of the site. This latter area is dominated by a mima mound topography and it supports the greatest plant and wildlife diversity found in the immediate vicinity. Johnson Canyon to the north provides adjacent open space and may provide the necessary corridor to link any preserve on the Sunroad property with the wildlands being retained along Otay River to the north. The bulk of the Sunroad site will be padded out as industrial lots.

III. Methods

The Sunroad Centrum Property was surveyed approximately once a week during the roughly five-week duration of the year 2001 Quino season (but see following discussion). Weather conditions at the beginning and ending of each survey period were recorded and are presented in Table 1. The property was subject to an extensive pedestrian field effort with the focus of the effort being directed to the mima mound area in the north central part of the site and to the *Plantago* populations and other areas that could conceivably support the Quino Checkerspot (see Figures 4 and 6).

Of the 250-acres within the Sunroad ownership, approximately 170-acres were excluded from consideration due to their being occupied by a near monotypic stand of Black Mustard (*Brassica nigra*; see Figures 4 and 6). The Mustard forms such a dense closed canopy as to preclude any plant that would be utilized by the Quino.

The north central part of the property, approximately 80-acres, is characterized by a mima mound topography and is occupied by a complex matrix of non-native grassland, disturbed Coastal Sage Scrub and disturbed Native Grassland. It is this area that supported the limited population of *Plantago erecta* and of *Castilleja exserta* and it is this area that was subject to the intense pedestrian survey effort for the Quino. On each site visit, multiple, parallel transects were walked through this area with the observer focusing on the lepidopteran fauna.

During all survey efforts for the Quino Checkerspot, this observer was equipped with a collapsible

insect net (BioQuip), close focusing photographic gear, close focusing binoculars (10x30), and insect collecting equipment (various containers and killing jars). The photographic gear used this season consisted of a Canon Elan II body with a Canon Image Stabilized 75-300mm USM lens fitted with a 500D close up lens. This equipment allowed a minimum working distance of approximately fourteen inches with a maximum magnification of approximately 1:1. A Canon 380EX Speedlight flash was used in all field photography along with the ETTL capabilities of the camera system. This allowed all field photos to be shot at f16 and 1/125th when desired. On all field dates, wind, air temperature, and humidity were taken with a "TurboMeter" and a Control Company "Thermo-Hygro" meter respectively (both instruments available through Forestry Suppliers, Inc.). With these instruments it was possible to record wind speed to the nearest 0.1 mph, temperature to the nearest 0.1° and humidity to the nearest 1 percent.

Wherever possible, collecting was used to verify what would otherwise be transient field observations. For example, on this and other field sites, many of the Ladies were netted in order to confirm the species, as were many of the smaller whites, and voucher specimens were taken of selected species. All specimens taken on this and other sites are viewable in the author's private collection.

A discussion of the beginning and ending of the "official" year 2001 Quino field season is in order. The year 2000 survey protocols (Fish and Wildlife Service, 2000) have been applied to this year due to the fact that a court challenge has prevented the Service from updating or modifying the guidelines. From the outside looking in, it also appears that the pending legal action has influenced the beginning and ending dates of the field season for this year. Ostensibly, this year's field season began on 1 March (for the area south of State Route (SR) 78 and below an elevation of 2,000-feet) and ended on 19 April (http://carlsbad.fws.gov/Rules/QuinoButterfly/Quino_https/quino_flight.htm). There are, however, several notable difficulties with these beginning and ending dates.

The Quino Checkerspot (and butterflies in general) are bugs of bright skies and warm temperatures. Their flight is even more temperature dependent than moths and a number of other insects. Even the activity of the larvae is thermally dependent. On cloudy days the larvae cannot get their body temperature to sufficiently high enough level to actively feed. Weather then, is the first parameter that heavily influences the 2001 "official" flight season. For example, during the first eleven days of the season (1 March through 11 March) only two of the days were potentially suitable flight days while the other nine were encumbered by significant cloud cover (one hundred percent for several days), by rain, or by high winds, or by a combination of these conditions. Indeed, the first Quino adults of the year were not observed until 8 March, seven days after the opening of the season. Similarly, as the season progressed, the weather did not improve markedly until after the second week of April. For the nineteen days from 21 March through 9 April, only three of the days were suitable for butterfly work any where on the coastal strip of the County (or into the coastal foothills). The other sixteen days were typified by deep coastal eddies resulting in one hundred percent cloud cover along the coast and into the foothills. Clearly Quino were having a rough go of it during this time period.

Despite these weather restraints, the Service closed the Quino flight season south of SR 78 and below 2,000-feet in elevation, on 19 April. It appears that this date was arbitrary and more related to the outstanding lawsuit than it was to the actual behavior of the target species. For example, Robert Faught (personal communication to R. B. Riggan, Jr.) found three adult Quino on Otay Mountain on 9 May and Ken Osborne (personal communication to R. R. Riggan, Jr.) had several adult Quino at Lake Skinner the second week in May. It appears that the warm weather in the period following 9 April significantly favored the Quino.

For these reasons, it is felt that continuing the Otay Mesa survey seven days past the recommended closing of the "official" flight season is certainly in keeping with the actual biology of the Quino during the spring of 2001. Indeed, secondary food plants (Owl's Clover, *Castilleja exserta*) were not noted on the Sunroad site until the last week of the actual survey period (see slides accessioned into the senior author's collection).

IV. Results

The vegetation over are the bulk of the Sunroad Centrum property has been severely disturbed by past agricultural use and is dominated in the current year by Black Mustard (*Brassica nigra*). Nearly 170-acres out of the 250-acre site is essentially a giant mustard field (see Figure 4). Relatively small parts of the "excluded-area," in addition to the Black Mustard, also supported a typical suite of ruderal (non-native grassland) species. Typical plant species in this ruderal association include:

Centaurea melitensis
Hordeum leporinum
Erodium sp.
Hirschfeldia incana
Avena barbata
Bromus (several species)

The north central portion of the property retains a mima mound topography. This area has a sufficiently large deposit of cobbles and boulders that ploughing or disking was apparently considered infeasible and this portion of the Sunroad property was never used in mechanical agriculture (although it was probably extensively grazed). The mima mounds themselves support shrub species characteristic of disturbed Diegan Coastal Sage Scrub (element code 32500, in the sense of Holland, 1986). The interstices between the mima mounds are occupied by a suite of native and non-native grasses along with numerous native geophytes and a number of native forbs. This complex topography can be viewed as a checker board of disturbed Coastal Sage Scrub and disturbed Native Grasslands. Species typical of this checker board include:

<i>Viguiera laciniata</i>	San Diego Sunflower
<i>Simmondsia chinensis</i>	Jojoba
<i>Eriogonum fasciculatum</i>	California Buckwheat

<i>Artemisia californica</i>	California Sagebrush
<i>Malosma laurina</i>	Laurel Sumac
<i>Nassella</i> sp.	Needlegrass
<i>Sisyrinchium bellum</i>	Blue-eyed Grass
<i>Calochortus splendens</i>	Mariposa Lily

Sensitive plant species include (but are not necessarily limited to):

Coast Barrel Cactus	<i>Ferocactus viridescens</i>
San Diego Coyote Thistle	<i>Eryngium aristulatum</i>
San Diego Hasseanthus	<i>Dudleya variegata</i>

The *Eryngium* is, of course, found in the vernal pools on the property. These were not censused as a part of this field effort but at least four pools with *Eryngium* were noted. The *Dudleya* is located in gravelly openings in the vegetation on the sides of the mima mounds. The *Dudleya* is illustrated in Figure 7 as a caterpillar eats away the succulent parts.

The greatest potential for the occurrence of *Plantago erecta* and other Quino larvae food plants is along the edges of the trails and jeep roads that cross the property and in association with the parts of the disturbed Sage Scrub and disturbed Native Grassland communities that exhibit open interstitial spaces. On the first site visit to the property, a walking tour of the site was conducted to determine if any larval food plants could be found. Only two small populations of *Plantago* were located during the first and subsequent visits to the site. These small populations occupy a portion of the east-west jeep track in the northern part of the property and a small area on the east side of the north-south jeep track in the central part of the focused survey area. Both populations are de minimus, consisting of only a few scattered individuals of *Plantago* (see Figure 6).

The following points highlight the results of the butterfly survey effort on the Sunroad Centrum property:

- A total of 14 butterfly species were observed. These are detailed in Table 1.
- The number of *Coenonympha tullia* found on the property was exceptional, up to 287 in one observational period. This population was apparently due to the to exceptional quantity of native bunch grasses in the north central part of the site.
- *Papilio zelicaon* was common on-site, but was highly localized at two points: along the north edge, next to Johnson Canyon, where there is a large stand of the species' larval food plant: *Foeniculum vulgare*; and on the hilltopping location east of elevation 593 on Harvest Road (see Figure 6).
- The absence of certain species was intriguing. For example, only two single "blues" were seen on the property, *Brephidium exile* and *Icaricia acmon*. Despite an extensive search of the relatively common larval food plant of *Brephidium exile*, *Atriplex semibaccata*, only one

butterfly was seen. *B. exile* can be an eruption species, sometimes seen in clouds of hundreds over a suitable food plant. Why only one individual on this site is unknown.

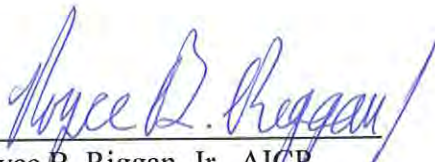
A compilation of the butterflies observed during the protocol survey effort is presented as Table 2. The reader's attention is directed to this table, to the attached Figure 5, and to the attached Field Notes for additional information and detail on the results of the field efforts.

V. Recommendation

In that neither larvae nor adults of the Quino Checkerspot Butterfly were identified during the protocol survey; and, only an extremely limited population of food plants suitable for the Quino Checkerspot were identified within the bounds of the property, it would appear that development of the Sunroad Centrum Property will have no effect on the endangered Quino Checkerspot Butterfly. Absent a demonstrable effect on the species, no mitigation measures are required, and none are recommended.

VI. Certification

This report is based on an independent review and analysis of the 250-acre property within the County of San Diego identified as the Sunroad Centrum Property. Any errors or omissions are solely the responsibility of the author.



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RBR Job Number 1825.10BC
11 June 2001

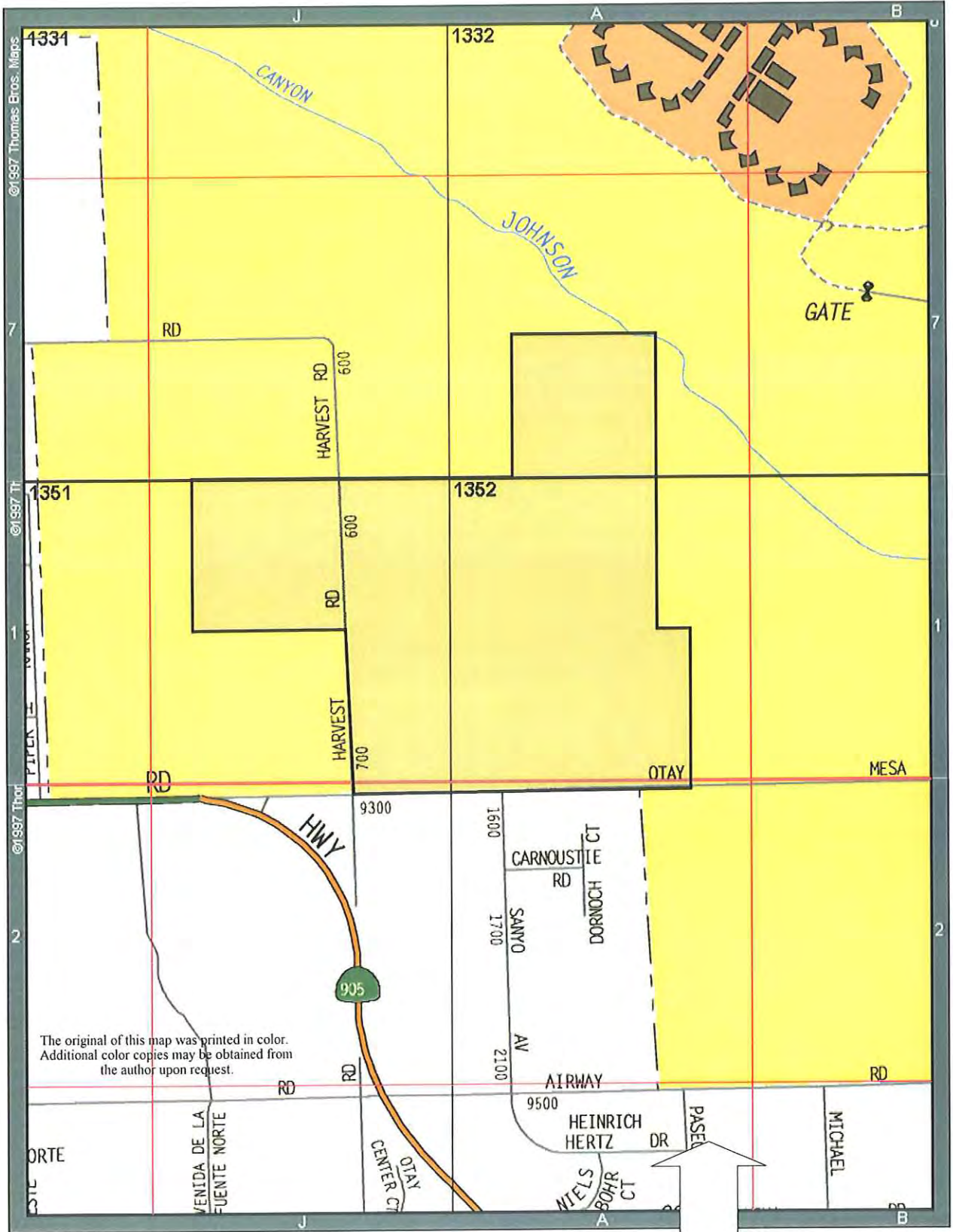
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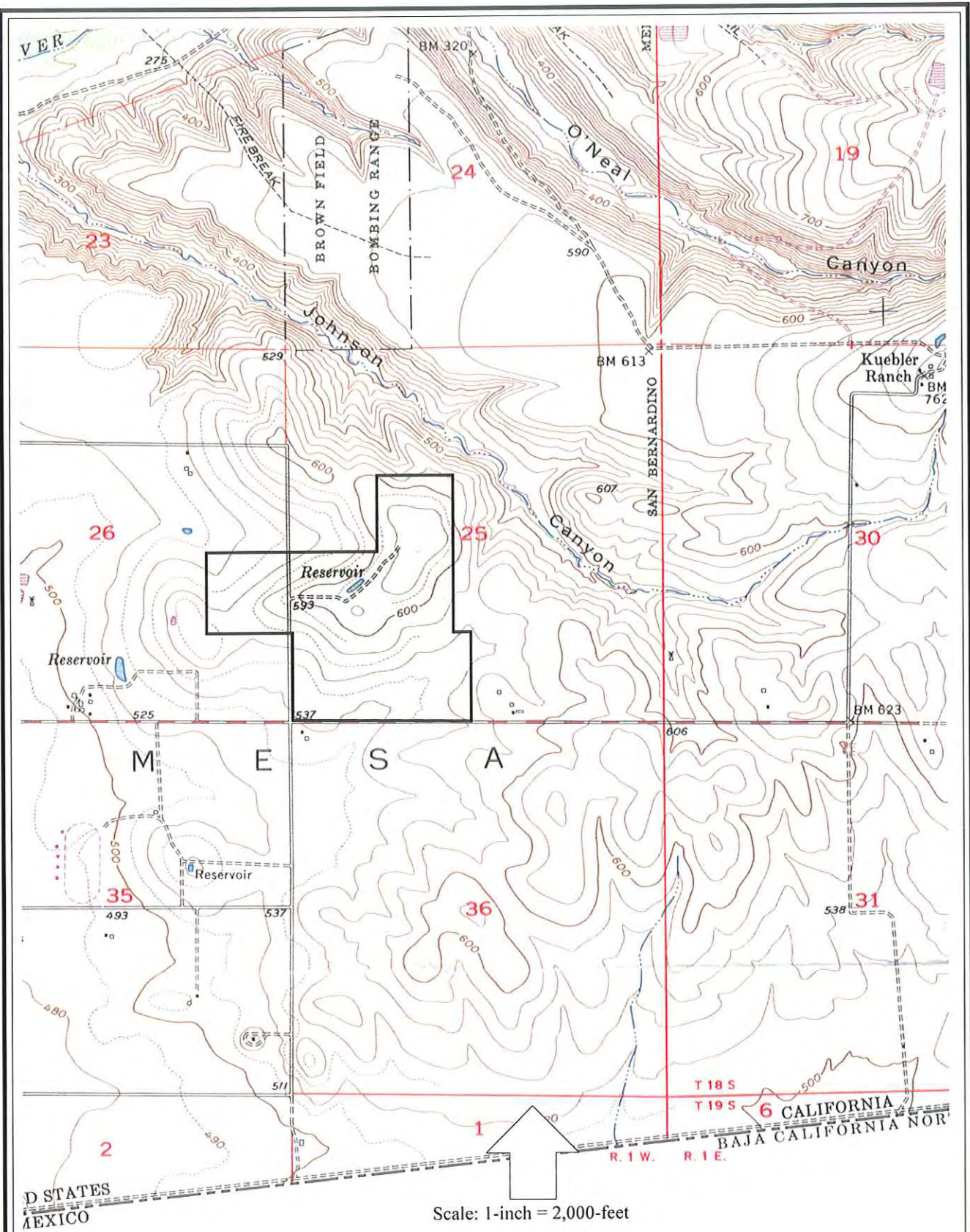
7 June 2001

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**Location of the 250-acre Sunroad Centrum
Property on a Thomas Brothers Base Map**
[map © Thomas Bros Maps]

**Figure
1**



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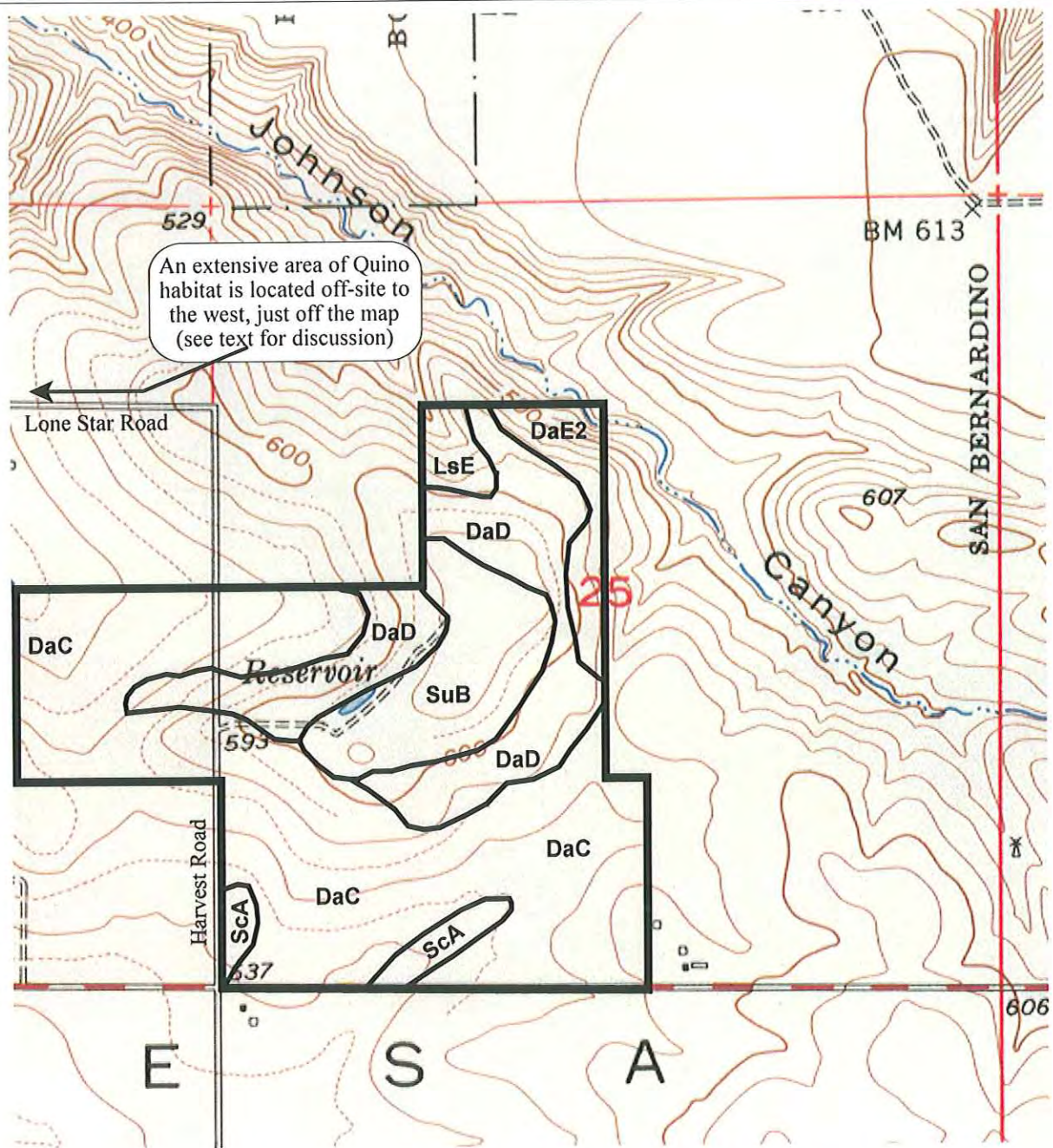
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Associates**

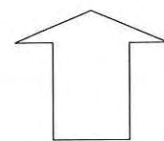
**Location of the 250-acre Sunroad Centrum
Property on a Scanned Portion of the U.S.G.S.
7½-minute Otay Mesa Quadrangle Map**

**Figure
2**



KEY TO SOIL TYPES:

- DaC** — Diablo Clay, 2-9% slopes [surface layer moderately Alkaline clay, 27-inches thick]
- DaD** — Diablo Clay 9-15% slopes
- DaE2** — Diablo Clay 15-30% slopes, eroded
- ScA** — Salinas Clay 0-2% slopes [clay loam, may have a surface layer of clay]
- SuB** — Stockpen Gravelly Clay Loam, 2-5% slopes
- LsE** — Linne Clay Loam, 9-30% slopes



Scale: 1-inch = 1,000-feet

RBRiggin and Associates Job Number 1825.10C

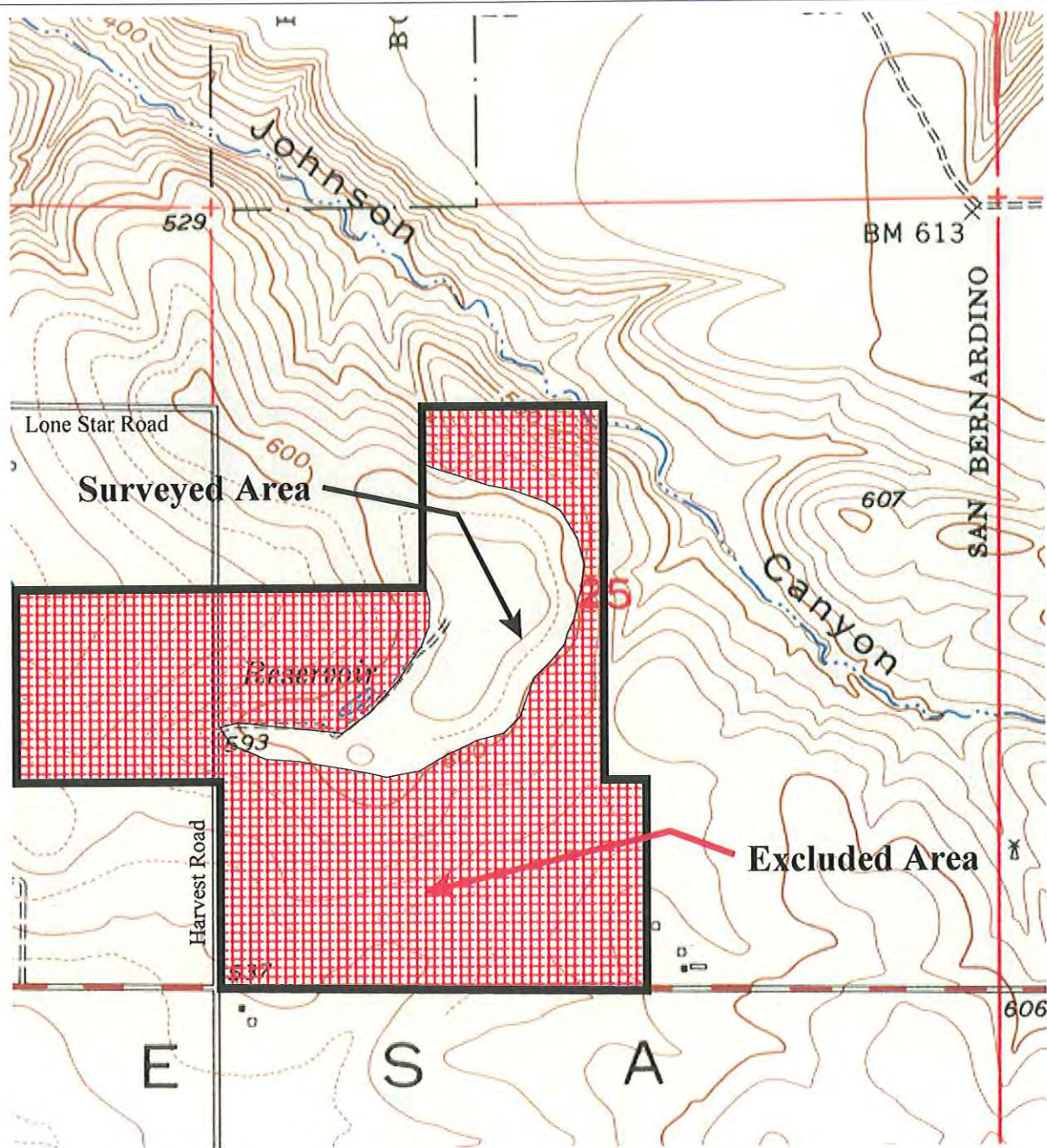
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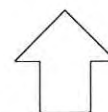
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and
Associates**

**The 250-acre Sunroad Centrum Property
with Soil Types Delineated (after Bowman, et
al., 1973) and Other Resources Identified**

**Figure
3**



NOTE: Areas excluded from the 2001 Quino survey effort are shown in red in the above graphic. Areas shown in red had been generally subject to agricultural disturbance in recent years and supported a near monotypic stand of Black Mustard (*Brassica nigra*). This mustard stand was sufficiently dense as to physically retard penetration by field observers. One hundred percent ground cover was achieved. The non-excluded area also supported dense growths of non-native “weeds” but this area had not been subject to agriculture as recently and supported significant native vegetation along with mima mound topography (see text for additional information).



Scale: 1-inch = 1,000-feet

RBRiggin and Associates Job Number 1825.10C

7 June 2001

[\\1825-fig-4.wpg]

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**The 250-acre Sunroad Centrum Property with
“Exclusion” areas shown (Per the Federal
Survey Protocols — See Text for Discussion)**

**Figure
4**



California Ringlet (*Coenonympha tullia*) —
An abundant species on the Sunroad property. The larvae of this somewhat obscure species feed on annual grasses, a food source abundant on the project site.
(Photo of a specimen on-site.)



Sara Orange-tip (*Anthocharis sara*) —
Individuals of this species were seen on-site only early in the flight season. The larvae feed on a variety of mustard family plants. This is a photograph of the underside of a mounted specimen from the author's reference collection.



Behr's Metalmark (*Apodemia virgulti*). This species is abundant in the foothills and was seen regularly on the Sunroad property. The larvae are found on California Buckwheat, a shrub that is relatively sparse on the site., being found primarily on the old mima mounds.



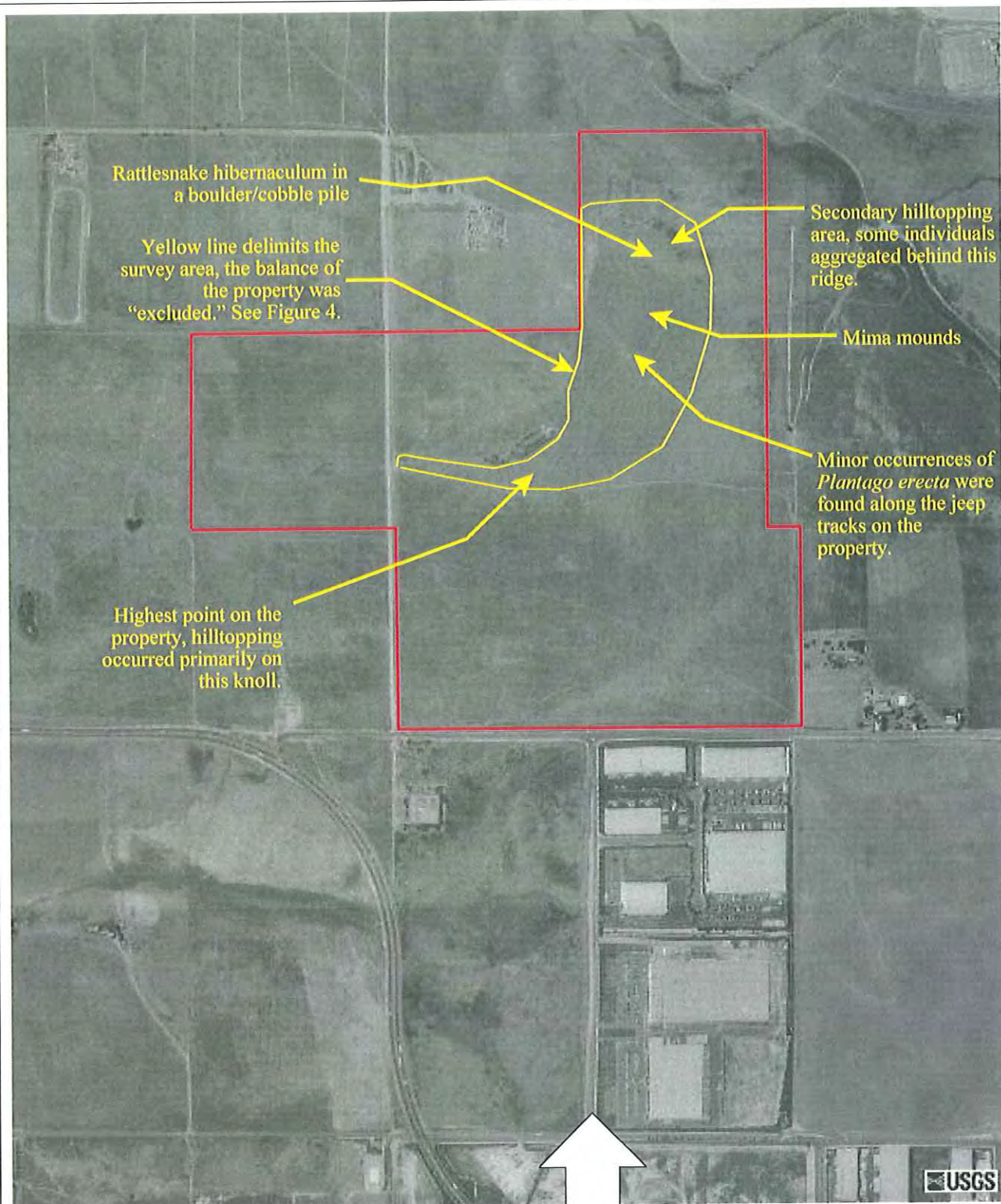
Painted Lady (*Vanessa cardui*) — The one "lady" seen with any commonality on the Sunroad site. At least a few individuals of this species were noted during each of the survey dates. However, the extensive numbers seen in migration on other properties were not noted on the Sunroad site.



Common White (*Pontia protodice*) —
Occasional on the Tract. This normally common species was seen only irregularly during the 2001 flight season. The larvae of this species feed on a variety of mustard family plant species.



Anise Swallowtail (*Papilio zelicaon*) — This large butterfly was relatively common in the northern part of the property and on the central "hilltopping" location. In the northern area were extensive stands of "Anise" (*Foeniculum vulgare*) the larval food plant of the species.



The original of this graphic was produced in color. Additional color copies may be obtained from the author.

No Scale

RBRiggin and Associates Job Number 1825.10C 7 June 2001

[A1825-Fig-6.wpg]

**RBRiggin
and
Associates**

**Location of the Sunroad Property and
Various Quino Parameters on an Aerial
Photograph (USGS, 11 December 1996)**

**Figure
6**



Mesa Brodiaea (*Brodiaea jolonensis*). Abundant on-site in depressions between the mima mounds. The only Brodiaea encountered during the field effort.



Southern Pacific Rattlesnake (*Crotalus viridis helleri*). A mating pair found under a sheet of plywood in the west central part of the property. The heavy grasses and abundant Vole population favor this species.



Owl's Clover (*Castilleja exserta*). This is suspected to be a Quino larvae food plant. Individuals of this species were found sparsely in the northeastern part of the Quino survey area (see Figure 4).



Un-named caterpillar consuming a *Dudleya variegata* plant. One hopes that the caterpillar species is as sensitive as is the *Dudleya*.

Chocolate Lilies (*Fritillaria biflora*). These lilies were found only in the extreme northern part of the Quino survey area, where they were highly localized but common.



The original of this graphic was produced in color. Additional color copies may be obtained from the author.

Table 1

**Summary of Weather Conditions at the
Time of the Individual Survey Dates**

Sunroad Centrum Property						
Date	Beginning of Observational Period			End of Observational Period		
	Wind	Air Temp	Humidity	Wind	Air Temp	Humidity
14 March	—	—	—	1.6-3.9mph	70.7°	47%
27 March	2.2-4.6	77.8°	49%	4.2-8.7	70.5°	48%
16 April	3.7-9.9	76.8°	46%	3.2-8.7	77.2°	39%
21 April	0.0-5.7	78.9°	47%	2.3-8.6	80.3°	39%
26 April	1.5-6.3	83.6°	40%	0.3-3.8	69.7°	45%

Table 2

**Summary of the Butterfly Species
Observed on the Sunroad Centrum Property in Otay Mesa,
San Diego County, California**

Scientific Name*/Common Name	14 March	27 March	16 April	21 April	26 April
<i>Anthocharis sara</i> (Sara Orange-tip)	2	1	—	—	—
<i>Apodemia virgulti</i> (Morman Metalmark)	5	22	20	9	17
<i>Brephidium exile</i> (Pygmy Blue)	1	—	—	—	—
<i>Coenonympha tullia</i> (California Ringlet)	105	287	103	42	29
<i>Erynnis</i> sp. (Dusky-wing)	—	12	—	2	—
<i>Erynnis</i> cf. <i>funeralis</i> (Funereal Dusky-wing)	—	1	—	—	—
<i>Icaricia acmon</i> (Acmon Blue)	1	—	—	—	—
<i>Papilio zelicaon</i> (Anise Swallowtail)	25	13	3	1	—
Pierid, undifferentiated (White)	1	—	—	—	3
<i>Pieris rapae</i> (Cabbage White)	—	—	3	—	—
<i>Pontia protodice</i> (Common White)	—	15	10	7	8
<i>Strymon melinus</i> (Gray Hairstreak)	4	—	—	—	—
<i>Vanessa</i> sp. (Lady)	2	—	5	7	—
<i>Vanessa annabella</i> (West Coast Lady)	1	1	—	—	2
<i>Vanessa cardui</i> (Painted Lady)	—	13	14	18	19
<i>Zerene eurydice</i> (California Dogface)	—	—	—	—	1
Total Individuals/ Total Species Observed	147/ 9	365/ 9	158/ 6	86/ 6	79/ 7

*For a discussion of the species names, identification, and species observed, see text.

Attachment A

Field Notes

Field Notes Relative to the Sunroad-Centrum Site

Extracted from the Field Notebook of

Royce Riggan, Jr.

14 March 2001

The following notes were taken during a visit to the 250-acre property on east Otay Mesa known as the Sunroad-Centrum site, RBRiggan and Associates Job Number 1825.10C. RBRiggan and Associates has been retained to conduct a Quino Checkerspot presence/absence survey over the entire ownership. The property is illustrated in Figure X of these Field Notes and may be described as a portion of the SW $\frac{1}{4}$ of section 25, the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 25, and the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 26, all Range 1 West, Township 18 South, of the San Bernardino Meridian. The site encompasses an area of gently rolling hills on the eastern edge of the Mesa, approximately two-miles from the toe of Otay Mountain. The site appears to be overlain by slope wash from the highlands to the east. Rounded cobbles and small boulders are common and highest part of the property still exhibits a mima mound topography.

However, all but perhaps 100-acres of the property is occupied by a near monoculture of Black Mustard (*Brassica nigra*). On this date, with the mustard stands far from mature, an attempt was made to walk to the center of one of the 40-acre "mustard" parcels. The vegetation is sufficiently dense as to preclude ground visibility and the vegetation is sufficiently dense as to physically retard the progress of the field worker. Clearly, this vegetation is sufficient to warrant an "exclusion" under the current federal survey protocols for the Quino (Fish and Wildlife Service, 2000).

The north central, roughly 100-acres of the property does not appear to have been farmed; as does the balance of the site. The principle reason for this conclusion is the mima mound topography that dominates much of this part of the site. Individual mounds rise as much as four feet (or more) above the adjacent terrain which frequently appears as small cobble lined basins. The vegetation in this part of the property is that of a heavily disturbed native grassland — geophytes of several species are common in the basins, *Stipa* sp. is common among the non-native grasses, and the mima mound tops appear to support a relictual Coastal Sage Scrub association. This latter association is poorly developed on the property and it is difficult to decide whether that is due to prior disturbance or if the association only occupied a limited component (the tops of the mima mounds only) even pre-historically?

This is the first visit made to the site out of five required visits. On this date, the site was walked between 0845 and 1315 hours. Weather measurements were not made at the beginning of the observational period, suffice it to say that it was warm, clear, dead calm, and with low humidity. The ending humidity was 47%, the ending temperature was 70.7 degrees and the ending winds were from 1.6 to 3.9 mph. The site was surveyed by two observers: the R. Riggan and Gretchen Morse.

Butterflies observed included:

Papilio zelicaon (25) — The extreme north edge of the property, as it falls away into Johnson Canyon, supports an extensive growth of Sweet Fennel (*Foeniculum vulgare*). The bulk of these Anise Swallowtails were seen along the north edge of the high ground adjacent to that Fennel association.

Coenonympha tullia (105) — throughout the area surveyed. This number is conservative and under estimates the number of individuals seen. These numbers reflect the amount of native grasses remaining in the “mima mound” part of the property.

Apodemia virgulti (5)

Vanessa sp. (2)

Pierid (1)

Strymon melinus (4)

Anthocharis sara (2)

Icaricia acmon (1)

Vanessa annabella (1)

Brephidium exile (1)

Considerable effort was expended on this first field date in an attempt to locate on-site populations of *Plantago erecta*. Obviously the “excluded” mustard areas of the property will not support this species. The only “openings” seen that would be favorable to its growth were the limited number of vehicle tracks that cross the property. A probable small and dispersed population of the *Plantago* was found on the jeep track in the northeastern part of the property, near the eastern property line. The identification was suspect due to the early growth stage (vegetative) of the small plants. [The identification was confirmed the following site visit]. No other *Plantago* was seen during this site visit.

In the northern part of the property there are two patches of boulders and cobbles that lie unconformably on the soil surface. These piles are on the order of 30-feet by 15-feet and are elliptical in shape. Each consists of several hundreds (thousands??) of cobbles and boulders stacked on one another and with sufficient depth that (when looking down between the rocks) the “bottom” cannot be ascertained. The only explanation we have been able to conjure up is that these are waste piles for rocks encountered during the plowing of the adjacent properties. Apparently (??) over a period of years, each time an offending rock was encountered in the adjacent fields, it was carried to one of these two piles and dumped. It appears that, over a period of years, the weight of the rocks has pushed downward, displacing the underlying clay soils and being the rock pile down almost to the surface level of the surrounding soils.

On the northwestern most of these two cobble piles a total of five *Crotalus viridis helleri* were found in an area approximately 10-feet in diameter, primarily on the boulder pile but including a small area of grass at the edge of the pile. This finding was not without a modicum of humor in that the junior author, approaching the rocks reluctantly, ended up “bunny hopping” at least two of the snakes. Several of the individuals were photographed and the slides filed in the senior author’s collection. It would appear that the cobble pile functions as a hibernaculum! All five of the Southern Pacific Rattlesnakes were coiled, sunning themselves, as if this was one of the first warm days they had encountered since winter. A sixth Southern Pacific was found sunning itself at the edge of the more eastern boulder/cobble pile. [Note added on 3 June 01: Pete Yingling opined that while there has

been suspicion that the Southern Pacifics in San Diego County utilize hibernacula, it has only been confirmed in less than a handful of cases. That observation makes the occurrence of this cobble pile all the more significant a find].

Western Meadowlarks and Grasshopper Sparrows were both noted on the Sunroad site. The Grasshopper Sparrows were calling on territory.

A large number of geophytes were noted on the property (at least within the bounds of the "mima mound" area). On this field date *Zigadenus fremontii* and *Fritillaria biflora* were at the peak of their phenology. Both were photographed and slides are cataloged in the senior author's collection. The *Zigadenus* were scattered throughout the mima mound area while the *Fritillaria* were isolated in a few clusters in the extreme northern part of the mima mound area. *Dodecatheon clevelandii* were also in full bloom across the site, being most abundant in the low spaces between the individual mounds.

27 March 2001

The following notes were taken during a visit to the 250-acre property on east Otay Mesa known as the Sunroad-Centrum site, RBRiggan and Associates Job Number 1825.10C. RBRiggan and Associates has been retained to conduct a Quino Checkerspot presence/absence survey over the entire ownership. The project site, its location, and the geology and vegetation are described in greater detail in these notes at 14 March 01. The reader's attention is directed to that entry for additional information.

This is the second visit made to the site out of five required visits. On this date, the site was visited between 1245 and 1515 hours. The weather at the beginning of the survey was 77.8 degrees, 49% humidity and winds from 2.2 - 4.6 mph. At the end of the survey, the temperature was 70.5 degrees, humidity was 48%, and the ending winds were from 4.2 to 8.7 mph. The site was surveyed by two observers: Riggan and Gretchen Morse.

It should be noted that there is considerable variability across the site in wind speed due to the micro-topography of the terrain. Wind measurements are made at the point on Harvest Road where the Jeep is routinely parked. This is a high point (shown as "593" the USGS quadrangle map — see Field Notes Figure X). The wind has a clear reach to the west from this point, which is also the local high point. For these reasons, wind speeds measured at this point were considered to be maxima for the immediate vicinity. As one moved back into the mima mound topography the wind became much more irregular and generally wind speed dropped. At a micro-scale, the depressions between the mima mounds frequently were still, even though there was a wind blowing a few feet above the maximum height of the mounds.

Butterflies observed included:

Papilio zelicaon (13) — The majority of individuals were seen hilltopping on the high ground just to the east of "593" (see Field Notes Figure X). Additional individuals were flying in the northeastern corner of the study area (see Field Notes Figure X),

beyond which there are large stands of *Foeniculum vulgare*.

Coenonympha tullia (287) — This is a conservative number, it probably under estimates the actual number of *Coenonympha* observed. There is a significant component of native grass (a bunch grass, probably a *Stipa* sp.) in the interstices between the mounds and, to a lesser extent on the facies of the mounds.

Apodemia virgulti (22) — isolated on the uncommon *Eriogonum fasciculatum* shrubs that are sparse on the mounds.

Vanessa cardui (13)

Vanessa annabella (1)

Pontia protodice (15)

Anthocharis sara (1)

Erynnis sp. (12) — none were collected. A number were *E. funeralis* but many lacked the whit terminal band on the HW.

Erynnis cf. *funeralis* (1)

Other observations by Morse included zero *Crotalus viridis helleri* (THANK GOD!), Grasshopper Sparrows, Western Meadowlarks and one Black-tailed Jack Rabbit (*Lepus californicus bennettii*). There appears to be a low density population of the latter species within the bounds of the subject property.

The suite of blooming annuals and perennials is changing. Those observed on the 14th are now being replaced in visual dominance by a native onion (*Allium* sp.; not keyed, species uncertain), and Blue-eyed Grass (*Sisyrinchium bellum*). The latter was particularly common and both were generally found in the interstices between the mounds. Both were photographed and slides are cataloged in the senior author's collection.

Plantago erecta was found in bloom on the subject property today. A small scattering of individuals was seen along the jeep road in the northeastern part of the survey area, where previously reported. An additional diffuse, small population was found in openings in the vegetation in the south central part of the survey area (see Field Notes Figure X). Both populations were de minimus in area and in number of individuals. Indeed, both were so small that finding them was almost serendipitous.

16 April 2001

The following notes were taken during a visit to the 250-acre property on east Otay Mesa known as the Sunroad-Centrum site, RBRiggan and Associates Job Number 1825.10C. RBRiggan and Associates has been retained to conduct a Quino Checkerspot presence/absence survey over the entire ownership. The project site, its location, and the geology and vegetation are described in greater detail in these notes at 14 March 01. The reader's attention is directed to that entry for additional information.

This is the third visit made to the site out of five required visits. On this date, the site was visited between 1300 and 1545 hours. The weather at the beginning of the survey was warm and windy with a temperature of 76.8 degrees Fahrenheit, a humidity of 46% and winds ranging from 3.7 to 9.9 mph

[however, see discussion of wind under the notes dated 27 March 2001]. The ending humidity was 39%, the ending temperature was 77.2 degrees and the ending winds were from 3.2 to 8.7 mph. The site was surveyed by two observers: the senior author and Gretchen Morse.

Butterflies observed included:

Pontia protodice (10) — These larger whites are easily distinguished from the smaller Ringlet's; especially given the flight pattern of the latter species. As many as possible of the whites were netted so as to confirm the species identification. All so netted were *P. protodice*.

Papilio zelicaon (3) — a few individuals were seen hilltopping on the high ground to the east of the point on Harvest Road labeled as "953."

Coenonympha tullia (103) — Again, this number is probably an under estimate of the number of individuals actually seen. Within the area surveyed the Ringlets were most common where the native bunch grasses were most common. As one moved away from the native grasses, into old farmed areas where the grasses are exclusively non-native weed species, the number of *Coenonympha* observations dropped to zero.

Apodemia virgulti (20)

Vanessa sp. (5)

Vanessa cardui (14) — most of these individuals were seen moving to the north. A significant migration of the *V. cardui* occurred this season. The flight peaking a few days before this field observation. Virtually billions of individuals of this species moved through San Diego County over a few days in the middle part of April. That so few individuals were seen on-site this date was a little of a surprise. Apparently the bulk of the coastal migration has passed.

Pieris rapae (3) — a few individuals were seen closely or were netted.

Plantago erecta was observed in bloom on the east-west jeep track in the northern part of the property and in small, bare patches of ground on the east side of the north-south jeep track in the south central part of the area surveyed. These are the same de minimus populations previously reported in these notes..

Other observations by Morse included one *Crotalus viridis helleri* (that I almost stepped on!), Western Meadowlarks, Grasshopper Sparrows and *Dudleya variegata* not yet in bloom being munched on by caterpillars. The senior author was able to obtain photographs of the latter event and these slides are cataloged into the author's collection. One image is reproduced in these Field Notes as Figure X.

A single *Lampropeltis getulus* (California or Common Kingsnake) was found near Harvest Road. The individual was in an area subject to future disturbance and it had a somewhat unique pattern, being half striped and half banded. For these reasons it was relocated to a different habitat (a preserve of comparable elevation and coastal exposure). Photographs were also obtained and are cataloged in the senior author's collection.

A considerable number of large, dark moths were flushed from the vegetation within primary survey area by both workers. Two were netted and accessioned into the author's collection. Both proved to

be individuals of *Autographa californica* (the Alfalfa Looper, a moth of the family Noctuidae; see Lafontaine and Poole, 1991, Fascicle 25.1). This is a common species but it was surprising to see so many in broad daylight during a Quino survey.

Several large (± 20 -30mm) beetles assignable to the Meloidae (Blister Beetles) were found feeding on the blooms of *Calochortus splendens*. A series of these were taken and are in the author's collection. They appear to be assignable to *Lytta*.

21 April 2001

The following notes were taken during a visit to the 250-acre property on east Otay Mesa known as the Sunroad-Centrum site, RBRiggan and Associates Job Number 1825.10C. RBRiggan and Associates has been retained to conduct a Quino Checkerspot presence/absence survey over the entire ownership. The project site, its location, and the geology and vegetation are described in greater detail in these notes at 14 March 01. The reader's attention is directed to that entry for additional information.

This is the fourth visit made to the site out of five required visits. On this date, the site was visited between 1130 and 1430 hours. The weather at the beginning of the survey was warm and windy with a temperature of 78.9 degrees Fahrenheit, a humidity of 47% and winds ranging from 0.0 to 5.7 mph. The ending humidity was 39%, the ending temperature was 80.3 degrees and the ending winds were from 2.3 to 8.6 mph.

The survey effort this date was conducted by the senior author. Butterflies observed included the following:

Coenonympha tullia (42) — as the site slowly dries out with the progressing spring, the number of individual Ringlets slowly is dropping.

Vanessa sp. (7) — *V. anabella* is common at this location and many of these may have been of that species. However, in not all cases can a distinction be made without netting the individual.

Vanessa cardui (18) — the majority of these individuals were moving north, despite the relative amount of lapsed time since the primary migration.

cf. *Pontia protodice* (7)

Erynnis sp. (2)

Apodemia virgulti (9)

Papilio zelicaon (1)

The number of *Autographa californica* has also dropped considerably. Several individuals, however, were flushed during the field check of the site.

A number of individuals (larvae) of *Hemileuca electra electra* were noted on their host plant, *Eriogonum fasciculatum*. This subspecies of moth (one of the Saturniidae) is limited in distribution to coastal southern California and coastal Baja California between Los Angeles and San Quintin respectively (see Tuskes, Tuttle, and Collins, 1996). Some concern has been expressed in the past as to the long-term viability of this subspecies population given its location in the coastal parts of the Californias. No attempt was made to assess the population size on the Otay Mesa property but it is

limited to the host plant, which is of restricted occurrence on-site, primarily to the tops of mima mounds.

26 April 2001

The following notes were taken during a visit to the 250-acre property on east Otay Mesa known as the Sunroad-Centrum site, RBRiggan and Associates Job Number 1825.10C. RBRiggan and Associates has been retained to conduct a Quino Checkerspot presence/absence survey over the entire ownership. The project site, its location, and the geology and vegetation are described in greater detail in these notes at 14 March 01. The reader's attention is directed to that entry for additional information.

This is the fourth visit made to the site out of five required visits. On this date, the site was visited between 1445 and 1700 hours. The weather at the beginning of the survey was warm and windy with a temperature of 83.6 degrees Fahrenheit, a humidity of 40% and winds ranging from 1.5 to 6.3 mph. The ending humidity was 45%, the ending temperature was 69.7 degrees and the ending winds were from 0.3 to 3.8 mph. The site was surveyed by two observers: the senior author and Gretchen Morse.

Butterflies observed included:

Coenonympha tullia (29) — still flying on-site in significant numbers. This species is at least bi-voltine in southern California and individuals can be found flying into the early fall.

Apodemia virgulti (17) — seen station keeping on the host plant, *Eriogonum fasciculatum*.

Vanessa cardui (19) — still moving north, but in greatly reduced numbers.

Pierid (3) — these were large whites but could not be netted or closely approached. In all probability they were Common Whites.

Pontia protodice (8)

Colias eurydice (1) — the first sulphur seen on the subject property.

Vanessa annabella (2) — seen in association with the weedy areas adjacent to the primary survey area. These individuals were hilltopping and were not moving in a migratory manner.

The *Plantago erecta* is wilting on the east-west jeep track in the northern part of the property and in the small, bare patches of ground on the east side of the north-south jeep track. Some green remains but the plants are fading rapidly.

Three *Crotalus viridis helleri* were seen on this site visit. A mating pair were found beneath four by eight sheet of plywood. They were photographed and a slide set has been accessioned into the senior author's collection. It is interesting to note that all ten individuals seen on the property this spring were varying shades of tan and brown in color. This color pattern contrasts markedly with the basic black and white pattern that the subspecies exhibits in the higher foothills and in the mountains of San Diego County. This "brown" color pattern is consistent through the coastal foothills, for example all of the individuals of the subspecies observed in the hills of the City of Poway have been of the same color scheme. If the brown color scheme is consistent along the coast and the black and white pattern consistent in the higher elevations, one wonders how well defined is the contact line between the two forms and if there are obvious gradations between the two types at that boundary??

The third *Crotalus viridis helleri* was found on the trail and was nearly stepped on by the senior author's son who exhibited a vertical leap certainly consistent with the fine traditions of the airborne infantry.

The sequential blooming of geophytes and other notable spring annuals continues across the primary survey area. *Brodiaea jolonensis* is now coming into bloom and is abundant on the floors of the depressions between the mima mounds. Slides were obtained and have been accessioned into the senior author's collection. Virtually all of the other geophytes (including the *Calochortus splendens*) are well past their phenology as of this field date.

It would also be appropriate to note that no broad expanses of nectar plants suitable for the Quino were noted within the primary study area during the entire survey period. While the geophytes and others noted in text were visually impressive, none constituted an extensive potential nectar source. The vegetative landscape is dominated by grasses with geophytes with a few scattered shrubs. "Wild flowers" are not a significant component of the on-site vegetation.

A discussion of the beginning and ending of the "official" year 2001 Quino field season is in order. This is a standard paragraph that is being appended in some form to all of the author's studies for the year. The year 2000 survey protocols (Fish and Wildlife Service, 2000) have been applied to this year due to the fact that a court challenge has prevented the Service from updating or modifying the guidelines. From the outside looking in, it also appears that the pending legal action has influenced the beginning and ending dates of the field season for this year. Ostensibly, this year's field season began on 1 March (for the area south of State Route (SR) 78 and below an elevation of 2,000-feet) and ended on 19 April (http://carlsbad.fws.gov/Rules/QuinoButterfly/Quino_https/quino_flight.htm). There are, however, several notable difficulties with these beginning and ending dates.

The Quino Checkerspot and butterflies in general are bugs of bright skies and warm temperatures. Their flight is even more temperature dependent than moths and a number of other insects. Even the activity of the larvae is thermally dependent. On cloudy days the larvae cannot get their body temperature to sufficiently high enough level to actively feed. Weather then, is the first parameter that heavily influences the 2001 "official" flight season. For example, during the first eleven days of the season (1 March through 11 March) only two of the days were potentially suitable flight days while the other nine were encumbered by significant cloud cover (one hundred percent for several days), by rain, or by high winds, or by a combination of these conditions. Indeed, the first Quino adults of the year were not observed until 8 March, seven days after the opening of the season. Similarly, as the season progressed, the weather did not improve markedly until after the second week of April. For the nineteen days from 21 March through 9 April, only three of the days were suitable for butterfly work any where on the coastal strip of the County (or into the coastal foothills). The sixteen days were typified by deep coastal eddies resulting in one hundred percent cloud cover along the coast and into the foothills. Clearly Quino were having a rough go of it during this time period.

Despite these weather restraints, the Service closed the Quino flight season south of SR 78 and below 2,000-feet in elevation, on 19 April. It appears that this date was arbitrary and more related to the outstanding lawsuit than it was to the actual behavior of the target species. For example, Robert Faught (personal communication to R. B. Riggan, Jr.) found three adult Quino on Otay

Mountain on 9 May and Ken Osborne (personal communication to R. R. Riggan, Jr.) had several adult Quino at Lake Skinner the second week in May. It appears that the warm weather in the period following 9 April significantly favored the Quino.

For these reasons, it is felt that continuing the Otay Mesa survey seven days past the recommended closing of the "official" flight season is certainly in keeping with the actual biology of the Quino during the spring of 2001. Indeed, secondary food plants (Owl's Clover, *Castilleja exserta*) were not noted on the Sunroad site until the last week of the actual survey period (see slides accessioned into the senior author's collection).

**Quino Checkerspot Butterfly Report, 2016
with USFWS “Proposed 2016 Quino Checkerspot
Survey Protocol” Attached**

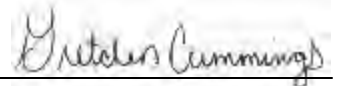
Report of a Federal Protocol Survey for the Quino Checkerspot Butterfly Over the Sunroad Centrum 250 Property County of San Diego, California

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18 May 2016
Job Number 1747.10C

Report of a Federal Protocol Survey for the Quino Checkerspot Butterfly Over the Sunroad Centrum 250 Property County of San Diego, California

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3. Figure 3 — Host Plant Locations on the Sunroad Centrum 250 Project Shown on a blow up of the U.S.G.S. 7½-minute Otay Mesa Quad Map
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Appendix A — Field Notes

Executive Summary

The Quino Checkerspot Butterfly (*Euphydryas editha quino*) is listed under the Federal Endangered Species Act (ESA) as an endangered subspecies. Prior to development-related activities that might adversely affect habitats potentially occupied by the butterfly, surveys are recommended so as to prevent a “take” of the species under the ESA. A federal protocol survey for the Quino Checkerspot Butterfly was conducted by Cummings and Associates during the 2016 flight season. No adult or larval Quino were found during the 2016 survey effort. One larval Quino host plant species, Dot-seed Plantain (*Plantago erecta*), was noted during the field surveys and it is represented on-site as a medium density population along the old Lone Star Road alignment.

I. Introduction

The Quino Checkerspot Butterfly (*Euphydryas editha quino*) is a small, spring flying butterfly listed under the Federal Endangered Species Act (ESA) as an endangered subspecies. Thought to be extinct in 1995, a small population was found in Riverside County in 1996 and the subspecies was listed as endangered in 1997 (USFWS, 1997). Critical habitat for this species was dedicated in 2002 (USFWS, 2002), then revised and finalized in 2009 (USFWS, 2009).

The Quino Checkerspot Butterfly is best thought of in two “phases”. The larvae (or first “phase”) are obligate feeders on a limited variety of food plants: Dot-seed Plantain (*Plantago erecta*), Owl’s Clover (*Castilleja exserta*), Woolly Plantain (*Plantago patagonica*), White Snapdragon (*Antirrhinum coulterianum*), Chinese Houses (*Collinsia concolor*), and Thread-leaved Bird’s Beak (*Cordylanthus rigidus*). The second “phase” is the adult butterfly which is much more mobile. The males of the species exhibit what is referred to as “hilltopping” behavior. They fly to prominent topographical points where they inspect each butterfly that passes-by in the hopes of finding a receptive female Quino.

This federal protocol survey for the Quino was conducted in accordance with the Proposed 2016 Quino Checkerspot Survey Protocol (USFWS, 2016). The survey for the Quino focused on the “open” areas in the vicinity of the old Lone Star Road alignment, and on the medium density population of the larval food plants. There were no appropriate high points on-site upon which to focus survey efforts.

II. Property Location and Description

The Sunroad Centrum 250 Property is comprised of Assessor’s Parcel Numbers 646-080-28, 646-080-33, 646-080-29, 646-08-31, 646-080-26, and 646-080-27. It is located in the extreme southern part of San Diego County, just north of the Mexican border on the north side of Otay Mesa Road and east of the South Bay Expressway (125) - see Figures 1 and 2. Mima mound topography occupies the central portion of the site and there are two small patches of Native Grassland habitat in the northeast corner of the site. However, the majority of the property is quite overcome with shin to thigh-high non-native plants, namely a dense stand of Russian Thistle (*Salsola tragus*) combined with Oats (*Avena fatua*) and Mustards (*Brassica nigra* and *Hirschfeldia incana*).

The underlying geology of the property is mapped as the Otay Formation (Todd, 2004). This mapping is consistent with the clay soils seen on the property. The surficial soils mapped by Bowman (1973) include the following:

- Diablo clay, 15 to 30% slopes, eroded (DaE2);
- Diablo clay, 9 to 15% slopes (DaD);
- Stockpen gravelly clay loam, 2 - 5% slopes (SuB);
- Linne clay loam, 9 to 30% slopes (LsE); and
- Salinas clay, 0 to 2% slopes (ScA).

The vegetative communities found on the property can be classified into five types:

Non-Native Grassland. The majority of the site is occupied by Non-Native Grassland dominated by a dense stand of Russian Thistle (*Salsola tragus*) combined with Oats (*Avena fatua*) and Mustards (*Brassica nigra* and *Hirschfeldia incana*). This habitat type is best described as Non-Native Grassland (Holland, 1986; Holland Element Code 42200). There are composition variations within this habitat caused by different underlying soils and human disturbances. One of these variations occurs along the old Lone Star Road alignment. Although there is Russian Thistle in this area too, its growth is stunted allowing native species, such as the Dot-seed Plantain to grow.

Native Grassland. Two small patches of Native Grassland (Holland, 1986; Holland Element Code 42100) occur in the northeastern portion of the property. Although interspersed with non-natives, dense native bunch grasses (*Stipa lepida*) dominate in this area.

Agriculture Stock Pond. An Agriculture Stock Pond occurs roughly in the middle of the property. The pond is now dry and is ringed with Russian Thistle.

Disturbed Habitat. Dirt trails traverse the property and are heavily used by off-road vehicles. Due to the consistent, heavy use, no vegetation grows on these trails and, as such, these areas are best classified as Disturbed Habitat (Holland, 1986; Holland Element Code 11300).

Non-Native Riparian. Johnson Canyon crosses the extreme northeast corner of the site. The canyon is occupied by a Tamarisk grove (*Tamarix* sp.). Therefore, this area is best classified as Non-Native Riparian habitat (Holland, 1986; Holland Element Code 65000).

III. Methods

Per the 2016 Quino Checkerspot Butterfly Survey Protocol (USFWS, 2016), a site assessment was conducted on 4 February 2016. The first portion of this site visit was dedicated to conducting the site assessment and the section portion of the visit was allocated to an initial host plant survey. The

majority of the site was able to be excluded due to the occurrence of dense Russian Thistle and other non-native plant species. The areas not excluded from the survey were considered suitable Quino habitat (see Figure 2). On 1 May 2016, the site assessment was revised and the host plant mapping was completed between 0900 and 1015 hours prior to the start of the first Quino survey which occurred between 1015 and 1400 hours. Four subsequent visits were conducted representing the remainder of the Quino survey dates. During all survey efforts for the Quino Checkerspot, the undersigned was equipped with a collapsible insect net (BioQuip), close focusing photographic gear, and close focusing binoculars (8x42). The photographic gear used this season consisted of a Nikon D300 body and a 70 - 300 mm Quantaray lens with a macro function. This equipment allowed a minimum working distance of approximately fourteen inches. During the six field dates, wind, and air temperature were taken with a Kestrel. With this instrument, it was possible to record wind speed to the nearest 0.1 mph, and temperature to the nearest 1°. Weather conditions at the beginning and ending of each survey period were recorded and are presented in Table 1.

IV. Results

A total of six site visits were made to the Sunroad Centrum 250 property between 4 February and 3 April. A medium density population of Dot-seed Plantain (*Plantago erecta*) was observed on-site (see Figure 3 for location). No larvae or adult Quino Checkerspot were observed on the property during any of the six site visits.

The following points highlight the results of the butterfly survey effort on the Sunroad Centrum 250 property:

- A total of 12 butterfly species were identified during the Quino survey (see Figure 4 for photos of the representative butterfly species observed and Table 2 for a list of the butterfly species).
- Two butterfly species, the Western Pygmy-Blue and the Anise Swallowtail, were observed during all six surveys.

A compilation of the butterflies observed during the protocol survey effort is presented as Table 2. The reader's attention is directed to that table, to the attached Figure 4, and to the attached Field Notes for additional information and details on the results of the field effort.

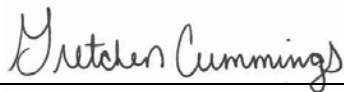
During the course of the survey, a concerted effort was made to identify other plant and wildlife species that would be considered sensitive. While this part of the field effort does not constitute a comprehensive survey, any observations of interest must be reported per the requirements of the federal protocol for the Quino. No other sensitive species were noted within the suitable Quino habitat.

V. Recommendation

Although a medium density population of a Quino larval host plant was identified on-site, no larvae nor adults of the Quino Checkerspot were identified during the 2016 protocol survey. Therefore, any proposed future development of the Sunroad Centrum 250 property will have no effect on the endangered Quino Checkerspot Butterfly. Absent a demonstrable effect on the species, no mitigation measures are required, and none are recommended.

VI. Surveyor Certification

I certify that the information in this survey report and attached exhibits fully and accurately represents my work. Any errors or omissions are solely my responsibility.

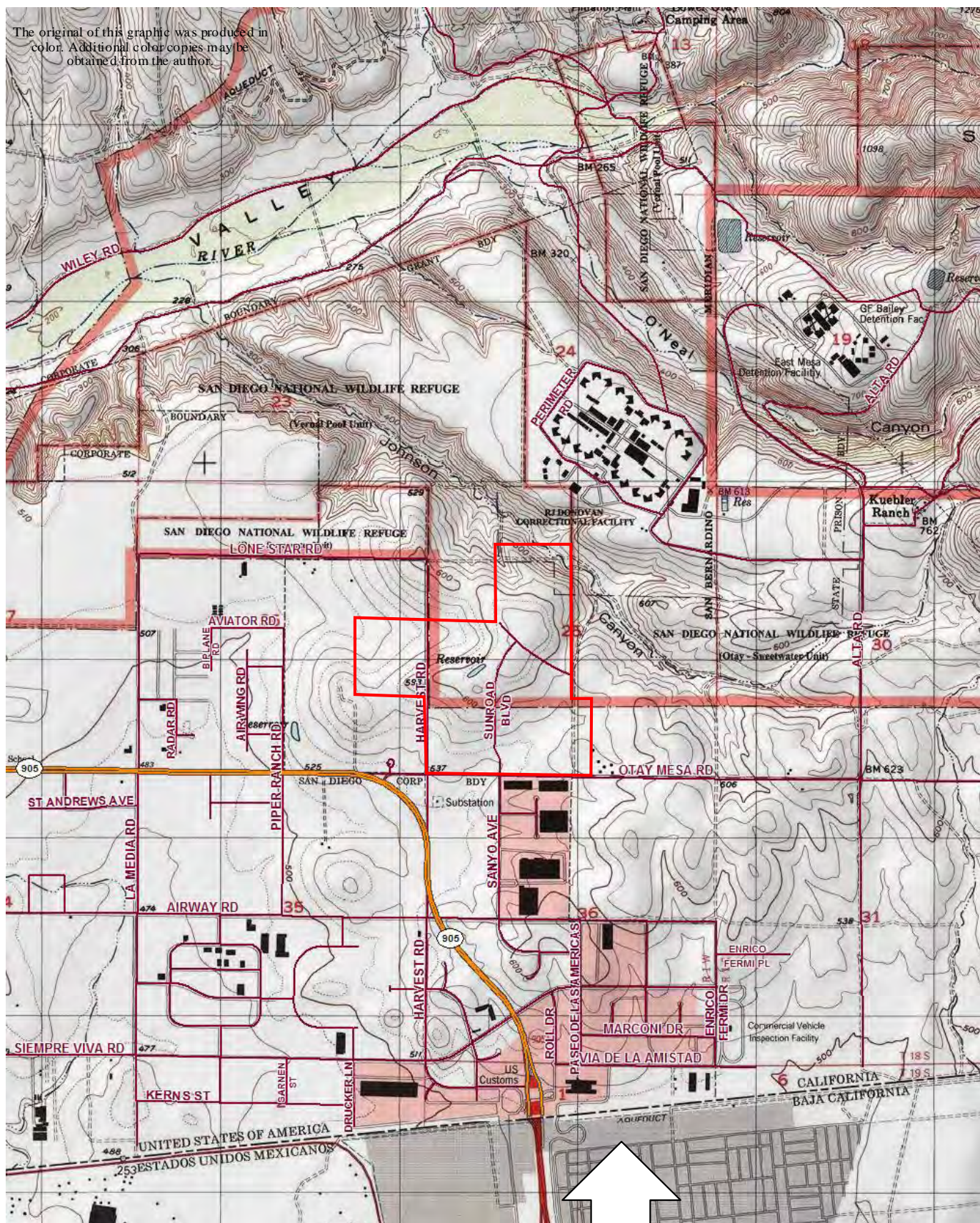


Gretchen Cummings
Principal/Consulting Biologist
[TE-031850-4]

5/18/16
Date

[\\1747Quino-report.wpd]

The original of this graphic was produced in color. Additional color copies may be obtained from the author.



Cummings and Associates Job Number 1747.10C 26 February 2016

Scale: 1-inch = 2,000-feet

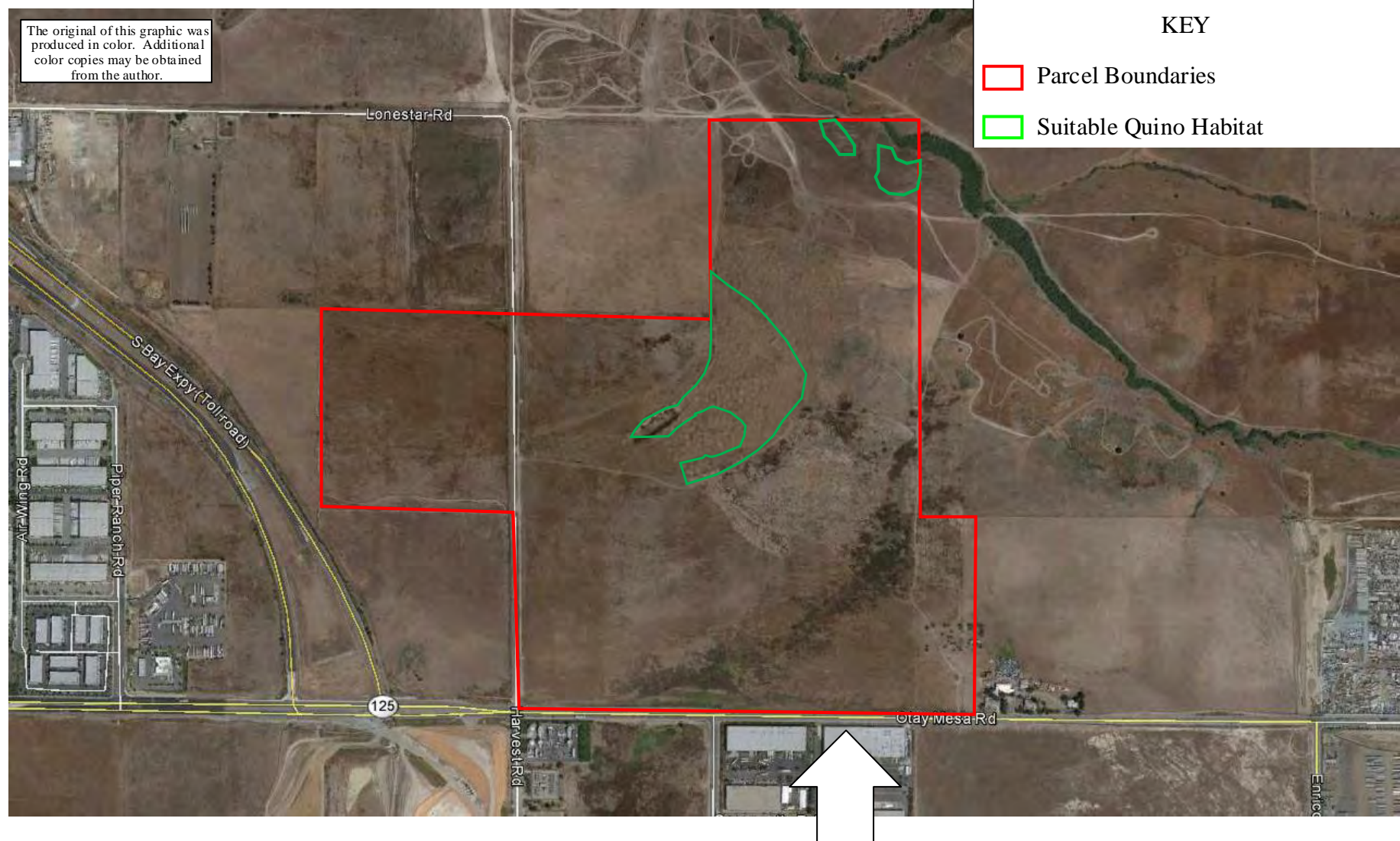
[1747-Fig-1-rev.ppp]

**Cummings
and
Associates**

**Sunroad Centrum 250 Project Shown on the
U.S.G.S. 7 ½-minute Otay Mesa Quad Map**
[Base Map Created with TOPO!® ©2006 National Geographic;
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**Figure
1**

The original of this graphic was produced in color. Additional color copies may be obtained from the author.



Cummings and Associates Job Number 1747.10C

1 March 2016

Scale: 1-inch = 1,000-feet

[:\1747-Fig-2-rev.pptx]

**Cummings
and
Associates**

**Suitable Quino Habitat on the Sunroad Centrum 250 Project
Shown on an Aerial Photo
[Base Photo © 2016 Google; Imagery Date 4/14/2015]**

**Figure
2**

KEY

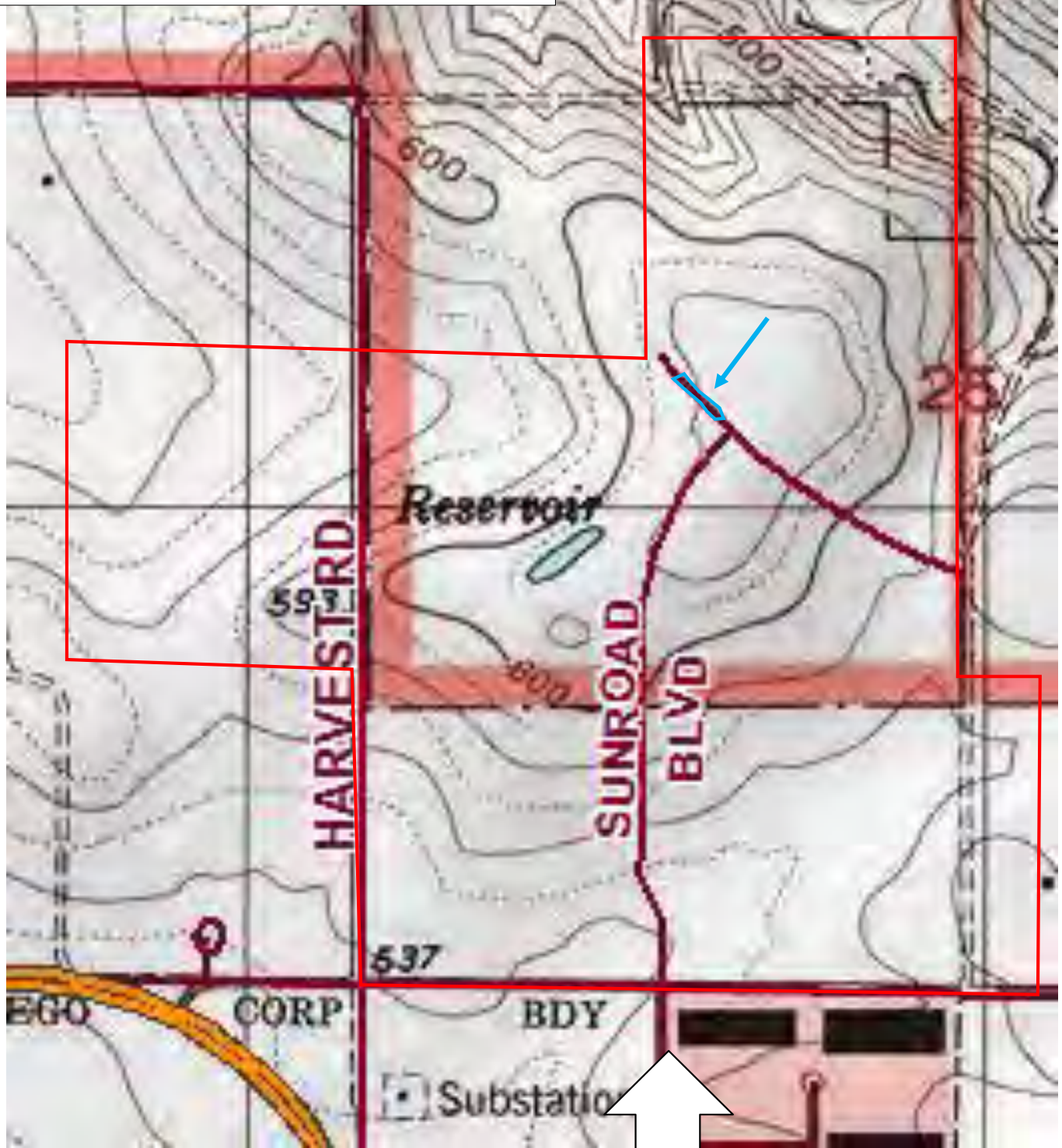


Parcel Boundaries



Medium Density *Plantago erecta* Population

The original of this graphic was produced in color. Additional color copies may be obtained from the author.



Cummings and Associates Job Number 1747.10C 1 March 2016

Scale: 1-inch = 500-feet

[:\1747-Fig-3.ppp]

**Cummings
and
Associates**

**Sunroad Centrum 250 Project Shown on the
U.S.G.S. 7 ½-minute Otay Mesa Quad Map**
[Base Map Created with TOPO!® ©2006 National Geographic;
©2005 TeleAtlas]

**Figure
3**



Figure 4A — Western Pygmy-Blue (*Brephidium exile*)

This species was seen during all six survey dates. The larvae feed on Russian Thistle, Satlbushes, and others. [Photo taken on-site during the Quino survey.]

Figure 4B — Anise Swallowtail (*Papilio zelicaon*)
This species was observed during all six survey dates. The larvae feed on Sweet Fennel. [Photo taken on-site during the Quino survey.]



Figure 4C — Gray Hairstreak (*Strymon melinus*)

This butterfly species was seen during the last four site visits. Larvae feed on plants in the Pea Family and Mallow Family [Photo taken on-site during the Quino survey.]

Figure 4D — White Checkered-Skipper (*Pyrgus albescens*)
This species was seen during four of the five Quino surveys. The larvae of this species feed on a variety of Mallow Family plant species. [Photo taken on-site during the Quino survey.]



Table 1

**Summary of Weather Conditions at the
Time of the Individual Survey Dates**

Sunroad Centrum 250 Property									
Survey	Date	Beginning of Observation Period				End of Observation Period			
		Time	Cloud Cover	Wind	Air Temp	Time	Cloud Cover	Wind	Air Temp
Site Assessment and Initial Host Plant Mapping	4 Feb	0930	Clear	< 1.2 mph	61.3°F	1340	Clear	2.4 - 4.1 mph	73.8°F
Finalize Host Plant Mapping	1 Mar	0900	30%	< 1.3 mph	67.5°F	1015	30%	< 2.0 mph	73.1°F
Quino Survey #1	1 Mar	1015	30%	< 2.0 mph	73.1°F	1400	40%	1.9 - 8.1 mph	73.8°F
Quino Survey #2	8 Mar	1000	Clear	2.8 - 4.8 mph	60.1°F	1330	Clear	5.9 - 8.3 mph with gusts to 11.4 mph	65.1° F
Quino Survey #3	18 Mar	1355	Clear	4.8 - 8.4 mph	71.9°F	1555	Clear	3.9 - 8.7 mph	73.4°F
Quino Survey #4	24 Mar	1330	Clear	7.0 - 11.5 mph	79.7°F	1530	Clear	4.1 - 9.1 mph	79.5°F
Quino Survey #5	3 Apr	1430	20%	4.3 - 8.3 mph	73.5°F	1630	30%	3.7 - 7.2 mph	74.2°F

[:\1747weather-tbl.wpd]

Table 2

**Summary of the Butterfly Species Observed at the Sunroad Centrum 250 Property
County of San Diego, California**

Scientific Name ¹ / Common Name	4 Feb ^{2, 3}	1 Mar ³	1 Mar ³	8 Mar	18 Mar	24 Mar	3 Apr
<i>Anthocharis sara</i> Sara Orangetip	—	—	—	—	1	1	—
<i>Brephidium exile</i> Western Pygmy-Blue	2	1	22	13	7	2	2
<i>Colias</i> sp. Sulphur	—	—	2	—	—	—	—
<i>Colias eurytheme</i> Orange Sulphur	—	—	—	—	—	—	1
<i>Erynnis funeralis</i> Funereal Duskywing	—	—	1	1	2	—	1
<i>Papilio zelicaon</i> Anise Swallowtail	2	1	8	4	4	1	3
<i>Pieris rapae</i> Cabbage White	—	—	1	—	—	—	—
<i>Pontia protodice</i> Checkered White	—	—	—	—	2	—	—
<i>Pyrgus albescens</i> White Checkered-Skipper	—	—	1	3	—	2	1

Scientific Name ¹ / Common Name	4 Feb ^{2, 3}	1 Mar ³	1 Mar ³	8 Mar	18 Mar	24 Mar	3 Apr
<i>Strymon melinus</i> Gray Hairstreak	—	—	—	1	1	1	3
<i>Vanessa annabella</i> West Coast Lady	—	—	—	2	1	—	1
<i>Vanessa cardui</i> Painted Lady	—	—	—	1	—	—	—
<i>Vanessa virginiensis</i> American Lady	—	—	—	—	—	—	5
Undifferentiated White	—	—	—	—	—	1	4
Total Individuals/ Total Species Observed	4/ 2	2/ 2	35/ 6	25/ 7	18/ 7	8/ 6	21/ 9

¹For a discussion of the identification and species observed, see text. Nomenclature taken from:

Cassie, Brian, J. Glassberg, A. Swengel, and G. Tudor. 2001. North American Butterfly Association (NABA) Checklist & English Names of North American Butterflies. Second Edition. North American Butterfly Association, Inc., Morristown, NJ, 60 pp.

²The first part of this site visit was the “site assessment” according to the Proposed 2016 Quino Checkerspot Survey Protocol.

³The latter part of the 4 February 2016 site visit was spent looking for host plants. The first part of the 1 March 2016 site visit was spent finalizing the host plant mapping. The second part of the 1 March 2016 visit was the first Quino survey.

[:\1747bug-tbl.wpd]

Appendix A

Field Notes

2016 Field Notes for the Quino Survey over the Sunroad Centrum 250 Property in Otay Mesa

4 February 2016

A Quino Checkerspot Butterfly habitat assessment and initial host plant survey was conducted over the Sunroad Centrum 250 property today (Cummings and Associates Job #1747.10C). The field survey occurred between 0930 and 1340 hours. The sky was sunny and clear throughout the site visit. The temperature rose during the survey period from 61.3°F at 0930 hours to 73.8°F at 1340 hours. Wind speeds were measured at < 1.2 mph at the beginning of the survey. At the completion of the visit, wind speeds were measured between 2.4 - 4.1 mph. Butterfly species observed during the habitat assessment and initial host plant survey were:

Brephidium exile (2)

Papilio zelicaon (2)

The only Quino host plant identified on-site was Dot-seed Plantain (*Plantago erecta*). A medium density population was noted along the old Lone Star Road alignment.

1 March 2016

The first part of today's visit was dedicated to finishing the Quino host plant mapping over the Sunroad Centrum 250 property (Cummings and Associates Job #1747.10C). This field work occurred between 0900 and 1015 hours. The sky was partly cloudy with 30% high cloud cover throughout the survey. Temperature increased from 67.5°F at 0900 hours to 73.1°F at 1015 hours. Wind speeds were measured at < 1.3 mph at the onset of the survey and at < 2.0 mph at the end.

Butterflies observed were:

Papilio zelicaon (1)

Brephidium exile (1)

The second part of today's survey represented the first of the protocol Quino surveys over the Sunroad Centrum 250 property (Cummings and Associates Job #1747.10C). The protocol survey occurred between 1015 and 1400 hours. The ambient temperature increased slightly from 73.1°F at the onset of the field visit to 73.8°F at the end of the survey. The wind was blowing from the west during the observation period. Wind speeds were measured at < 2.0 mph at the beginning of the visit and between 1.9 - 8.1 mph at the end of the survey. The sky was partly cloudy with 30% cloud cover at 1015 hours and 40% cloud cover at 1400 hours. Butterflies observed were:

Colias sp. (2)
Pyrgus albescens (1)
Erynnis funeralis (1)
Brephidium exile (22)
Pieris rapae (1)
Papilio zelicaon (8)

Nectaring sources included:

Erodium spp.
Dichelostemma capitatum
Sidalcea malviflora
Calystegia macrostegia
Lasthenia californica
Plantago erecta
Acmispon glaber
Allium praecox
Peritoma arborea
Sisyrinchium bellum
Calochortus splendens
Hedypnois cretica

NOTE: The only flowering plant in the Non-Native Grassland area was *Dichelostemma capitatum*.

8 March 2016

The second Quino protocol survey was conducted over the Sunroad Centrum 250 property today (Cummings and Associates Job #1747.10C). This second survey was conducted between 1000 and 1330 hours. The sky was sunny and clear throughout the survey. The temperature increased from 60.1°F at 1000 hours to 65.1°F at 1330 hours. Winds were blowing from the northwest at speeds between 2.8 - 4.8 mph at 1000 hours. At the end of the survey, the winds were blowing from the west, and were measured between 5.9 - 8.3 mph with gusts up to 11.4 mph. Butterfly species observed during this second protocol survey were:

Papilio zelicaon (4)
Brephidium exile (13)
Erynnis funeralis (1)
Pyrgus albescens (3)
Strymon melinus (1)
Vanessa annabella (2)
Vanessa cardui (1)

Nectaring sources included:

Dichelostemma capitatum
Brassica nigra
Sidalcea malviflora
Calystegia macrostegia
Lasthenia californica
Plantago erecta
Allium praecox
Peritoma arborea
Sisyrinchium bellum
Calochortus splendens

The *Plantago erecta* was still flowering, but some were starting to yellow.

Other observations included two Coyotes (*Canis latrans*) laying down together in the man-made “wetland”.

18 March 2016

Today the third of the required Quino protocol surveys was conducted over the Sunroad Centrum 250 property (Cummings and Associates Job #1747.10C). The field visit occurred between 1355 and 1555 hours. The sky was sunny and clear throughout the survey. Ambient temperatures were measured at 71.9°F at the onset of the visit and at 73.4°F at the end of the observation period. At the beginning of the survey, the wind was blowing from the west at speeds ranging from 4.8 - 8.4 mph. By the end of the visit, the winds were still blowing from the west, and were measured between 3.9 - 8.7 mph. Butterfly species observed during this visit were:

Papilio zelicaon (4)
Pontia protodice (2)
Erynnis funeralis (2)
Brephidium exile (7)
Anthocharis sara (1)
Vanessa annabella (1)
Strymon melinus (1)

Nectaring sources during this visit included:

Hirschfeldia incana
Medicago polymorpha
Dichelostemma capitatum
Calochortus splendens
Calystegia macrostegia

Sisyrinchium bellum
Lasthenia californica
Sidalcea malviflora
Plantago erecta
Acmispon glaber
Allium praecox

Some of the *Plantago erecta* was still green and flowering, but some has started to dry. Plants varied in height up to 2".

24 March 2016

Today the fourth of the required Quino protocol surveys was conducted over the Sunroad Centrum 250 property (Cummings and Associates Job #1747.10C). The field visit occurred between 1330 and 1530 hours. The sky was sunny and clear throughout the survey. Ambient temperatures were measured at 79.7°F at 1330 hours and at 79.5°F at 1530 hours. At the beginning of the survey, the wind was blowing from the west at speeds ranging from 7.0 - 11.5 mph. By the end of the visit, the winds were blowing from the west at speeds ranging from 4.1 - 9.1 mph. Butterfly species observed during this visit were:

Pyrgus albescens (2)
Papilio zelicaon (1)
Undifferentiated White (1)
Brephidium exile (2)
Anthocharis sara (1)
Strymon melinus (1)

Nectaring sources during this visit included:

Brassica nigra
Calystegia macrostegia
Calochortus splendens
Sisyrinchium bellum
Dichelostemma capitatum
Allium praecox
Lasthenia californica
Plantago erecta
Acmispon glaber
Melilotus indicus

NOTE: The only flowering plant in the Non-Native Grassland area was *Brassica nigra*.

Some of the *Plantago erecta* was still flowering, but definitely drying out.

3 April 2016

Today the fifth of the required Quino protocol surveys was conducted over the Sunroad Centrum 250 property between 1430 and 1630 hours (Cummings and Associates Job #1747.10C). The sky was partly cloudy throughout the survey with approximately 20% cloud cover at 1430 hours and 30% cloud cover at 1430 hours. Temperatures ranged from 73.5°F at the onset of the visit to 74.2°F at the end of the observation period. Wind speeds ranged between 4.3 - 8.3 mph from the west at the beginning of the butterfly survey. At the end of the visit, wind speeds were measured between 3.7 - 7.2 mph from the west. Butterfly species observed were:

Papilio zelicaon (3)
Undifferentiated White (4)
Strymon melinus (3)
Vanessa virginiensis (5)
Pyrgus albescens (1)
Brephidium exile (2)
Erynnis funeralis (1)
Colias eurytheme (1)
Vanessa annabella (1)

Nectaring sources during this visit included:

Brassica nigra
Calystegia macrostegia
Calochortus splendens
Bloomeria crocea
Sisyrinchium bellum
Eriogonum fasciculatum
Lasthenia californica
Brodiaea jolonensis
Acmispon glaber

NOTE: The only flowering plants in the Non-Native Grassland area were *Brassica nigra* and *Calystegia macrostegia*.

All of the *Plantago erecta* was dried out.

The only other observation of note was a Coyote (*Canis latrans*).

[:\1747Field Notes.wpd]

Proposed 2016 Quino Checkerspot Survey Protocol

The intent of this proposed Quino Checkerspot Butterfly (QCB) protocol is to combine elements of past U.S. Fish and Wildlife Service (FWS) protocols to use for the 2016 season (at a minimum). In order to do this, the 2002, early 2014, and late 2014 protocols were used. To that end, reporting and required survey areas remain the same as the December 2014 protocol. The protocol is as follows:

1.1 SITE ASSESSMENTS AND HOST PLANT MAPPING

- Site assessments involve conducting a general field survey of the site and mapping excluded areas and QCB survey areas, as defined below, on a U.S. Geological Survey 7.5' (1:24,000) topographic quadrangle map enlarged 200 percent.
- The site assessment shall be conducted before the first QCB survey and prior to host plant mapping.
- Excluded Areas not recommended for QCB surveys:
 - Orchards, developed areas, or areas largely dominated by non-native vegetation;
 - Small in-fill parcels (plots smaller than an acre completely surrounded by urban development);
 - Active/in-use agricultural fields without natural or remnant inclusions of native vegetation or that are completely without any fallowed or unplowed areas;
 - Closed-canopy woody vegetation including forests, riparian areas, shrub-lands, and chaparral. "Closed-canopy woody vegetation" describes shrubs or trees growing closely together in which the upper portions of the vegetation converge (are touching) to the point that the open space between two or more plants is not significantly different than the open space within a single plant. Closed canopy shrub-land and chaparral are defined as vegetation so thick that it is inaccessible to humans except by destruction of woody vegetation (branches) for at least 100 meters;
 - Small openings (e.g., less than an acre) completely enclosed within dense chaparral provided a site-specific justification is included in the report.
- QCB Survey Areas are all areas that are not excluded, regardless of the presence or absence of QCB host plants or nectar sources.
- Upon completion of the site assessment, QCB Survey Areas will be surveyed for known host and nectar plants such as dwarf plantain (*Plantago erecta*), wooly plantain (*Plantago patagonica*), white snapdragon (*Antirrhinum coulterianum*), rigid bird's beak (*Cordylanthus rigidus*) and/or Chinese houses (*Collinsia concolor*). All locations of host plants will be mapped with a GPS unit (or equivalent) and populations will be estimated to categorize density of host plant patches. For example, density categories could be: low density (1 - 100 plants), medium density (100 – 1,000 plants), and high density (1,000 – 10,000+ plants).

2.1 QUINO SURVEYS

- An appropriate reference population) will be surveyed on a weekly basis, starting the second week of January, by a permitted biologist. For 2016, Marron Valley will be used as the reference population, and it will be used to define the flight season for Management Units 3 (Janal) and 4 (Alisos) that is identified in the Management Strategic Plan for Western San Diego County (http://sdmmp.com/reports_and_products/Management_Strategic_Plan.aspx). Different parts of the QCB range may require different reference sites, and any reference sites chosen for other parts of the range will be approved by the Service. Reference population(s) will be monitored by only entities agreed up and approved by the Service. The purpose of this is to not overly sample the habitat and potentially negatively affect the population.
 - The monitoring biologist will assess the condition of host plants within the reference population, and note any signs of egg, larva (caterpillar), pupa (chrysalis), and adult butterflies.
 - The monitoring biologist will note weather conditions at the reference site and, to the extent feasible, monitoring days will be based on the weather conditions outlined in Section 3.0.
 - The biologist will work with the Service to make a reasonable effort to notify biologists potentially planning to conduct focused surveys in 2016, of the weekly survey results. This may occur by any means, including posting the results on a dedicated website or other similar media.
- QCB surveys shall not be conducted concurrently with any other focused survey (e.g. a coastal California gnatcatcher or QCB host plant survey). However, additional host or nectar plants observed during the survey effort should be mapped and quantified per Section 1.0.
- The entire QCB Survey Area identified in Section 1.0 shall be surveyed for QCB each week.
- Surveys shall be conducted weekly and spaced no closer than 4 calendar days apart (see Section 3.0 WEATHER- RELATED CONDITIONS).
- Surveys shall be conducted for a minimum of 5 weeks and will be initiated within one week of observed QCB flight at the reference site(s). It will be the surveyor's responsibility to stay informed of the reference site comparable to their specific project site. If no Quino are observed in the first 5 weeks, surveys will continue until the flight season is over or demonstrably on the decline in the reference site as determined in coordination with the surveyor and the Service.
- Surveys should be conducted at a rate of approximately 5-10 acres (2-4 hectares) per person-hour. Survey rate can depend on topography and other physical factors at the survey site. A full description of the QCB Survey Area should be provided in the survey report, noting any deviations from this specified survey rate.
- Survey routes shall be roughly parallel to each other and spaced approximately 30 feet (10 meters) apart.
- Survey routes shall cover within 15 feet (5 meters) of site boundaries and/or the perimeter of

excluded areas.

3.1 WEATHER-RELATED CONDITIONS

- Surveys will not be conducted when the following weather conditions exist:
 - Fog, drizzle, or rain;
 - Sustained or gusting winds that average greater than 15 miles (24 kilometers) per hour measured over a 30 second period at a height of 4-6 feet (1.2-1.8 meters) above ground level;
 - Temperature in the shade at ground level is less than 60° F (15.5° C) on a clear, sunny day with less than 50 percent cloud cover, or less than 70° F (21° C) on days with 50 percent or more cloud cover;
- Weather conditions are to be measured on site, using appropriate instrumentation, and are not to be estimated or obtained from internet websites where measurements are recorded off site;
- A weekly survey should only be missed because of week-long adverse weather. If a weekly survey is missed due to weather conditions, two surveys should be conducted on non-consecutive days the following week.