

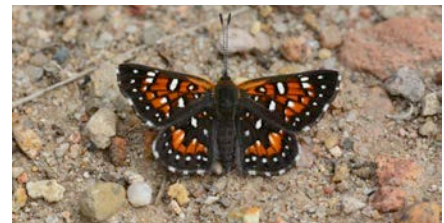
Pipeline Safety & Reliability  
Project U.S. Fish and Wildlife  
Service Protocol  
Presence/Absence 2016 Survey  
Report for the Quino  
Checkerspot Butterfly  
(*Euphydryas editha quino*)



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## 1. SUMMARY

This report summarizes the surveys conducted by Rocks Biological Consulting (RBC) and Insignia Environmental (Insignia) for the federally-listed endangered Quino checkerspot butterfly (*Euphydryas editha quino*; QCB) for the San Diego Gas & Electric Company (SDG&E) and Southern California Gas Company (SoCalGas) Pipeline Safety & Reliability Project (Proposed Project). Surveys were conducted in accordance with the U.S. Fish and Wildlife Service (USFWS) 2014 QCB survey guidelines (USFWS 2014; QCB survey guidelines), and were performed within Proposed Project areas that occur within the recommended Quino Survey Area (QCB survey guidelines) that were not surveyed in 2015. The QCB larval host plants dot-seed plantain (*Plantago erecta*) and purple owl's clover (*Castilleja exserta* ssp. *exserta*) were documented within the QCB Survey Area. Surveys were conducted between February 19 and May 12, 2016. Survey results were negative for QCB.

## 2. INTRODUCTION

### 2.1. PROJECT DESCRIPTION

The Proposed Project involves construction, operation, and maintenance of an approximately 47-mile-long, 36-inch-diameter natural gas transmission pipeline that will carry natural gas from SDG&E's existing Rainbow Metering Station to the pipeline's terminus on Marine Corps Air Station (MCAS) Miramar.

### 2.2. SURVEY LOCATION AND BACKGROUND

The Proposed Project is located in San Diego County, California, and crosses the cities of Escondido, Poway, and San Diego. U.S. Geological Survey (USGS). The Proposed Project crosses the 7.5-minute series quadrangle maps (quads): Temecula, Bonsall, San Marcos, Valley Center, Escondido, Poway, and La Mesa.

QCB surveys were performed for the Proposed Project in 2015, with the exception of the Elliot Chaparral Reserve, which is on land owned by the University of California Regents southwest of MCAS Miramar. The 2015 surveys were negative and are reported under a separate cover (RBC June 8, 2015). In 2016, RBC surveyed suitable QCB habitat within the Elliot Chaparral Reserve, also known as the 'Elliot Field Station' in order to complete Proposed Project protocol QCB surveys. The 2016 survey area is within the City of San Diego and on the Poway U.S. Geological Survey (USGS) 7.5-minute series quadrangle map (Figure 1).

There is no QCB USFWS-designated critical habitat within five miles of the Proposed Project. There are four recent California Natural Diversity Database (CNDDB) locations for QCB within five miles of the Proposed Project area. According to the MCAS Miramar Integrated Natural Resources Management Plan (INRMP 2014), no confirmed QCB sightings have been reported on MCAS Miramar. MCAS Miramar commissioned a protocol-level survey for QCB in 2011 within 1,400 acres of suitable habitat in East Miramar. No QCB were detected during the surveys (USMC 2014).

### **2.3. QUINO CHECKERSPOT BUTTERFLY NATURAL HISTORY**

Quino checkerspot butterfly, a member of the brush-footed butterfly family (Nymphalidae), was listed as federally endangered in January 1997. QCB, formerly known as *E. editha wrightii*, is one of 12 subspecies of the *Euphydryas editha* checkerspot (USFWS 2003).

Historically, QCB ranged from Los Angeles County and western San Bernardino County south through Orange County, western Riverside County, and San Diego County into northern Baja California, Mexico. Currently, QCB are only known to occur in portions of southwestern Riverside County, San Diego County, and northern Baja California (Mattoni et al. 1997). The dramatic decline of the species has been primarily caused by habitat loss and degradation. Both the larval and adult stages have specific habitat requirements that have been impacted by development, invasive non-native vegetation, overgrazing, poorly planned fire management practices, drought conditions, over-collection by butterfly collectors, and off-road vehicles (USFWS 1997).

The distribution of QCB is defined primarily by the location of its most common primary larval food plant, dot-seed plantain (*Plantago erecta*). Other potential larval food plants include purple owl's clover (*Castilleja exserta* ssp. *exserta*), desert plantain (*Plantago patagonica*), Parish's owl clover (*Castilleja densiflora* ssp. *gracilis*), southern Chinese houses (*Collinsia concolor*), Chinese houses (*Collinsia heterophylla*), Coulter's snapdragon (*Antirrhinum coulterianum*), and stiff-branched bird's-beak (*Cordylanthus rigidus* ssp. *setigerus*) (USFWS 2014).

QCB use a variety of sparsely vegetated habitats including open coastal sage scrub and chaparral, vernal pool complexes, oak woodland, and desert pinyon-juniper woodland. Densely vegetated areas and extensive open grasslands are not known to support QCB (Mattoni et al. 1997, USFWS 2014).

QCB primarily feed on the nectar of small annuals that flower concurrently with the adult flight season. Although most perennials are not in flower during the flight period, some may be used for nectar sources later in the season (Mattoni et al. 1997). QCB have a short tongue and therefore cannot feed on flowers with deep corolla tubes. In addition, they prefer to nectar on flowers that have a platform-like surface, which they use to remain upright while feeding (USFWS 2003).

Documented nectar sources for QCB include goldfields (*Lasthenia* spp.), gilia (*Gilia* spp.), farinose ground pink (*Linanthus dianthiflorus*), chia (*Salvia columbariae*), annual lotus (*Acmispon* spp.), yerba santa (*Eriodictyon* spp.), lomatium (*Lomatium* spp.), common muilla (*Muilla* spp.), popcorn flowers (*Plagiobothrys* spp. and *Cryptantha* spp.), yellow pincushion (*Chaenactis glabriuscula* var. *glabriuscula*), phacelia (*Phacelia* spp.), redmaids (*Calandrinia menziesii*), fiddleneck (*Amsinckia* spp.), yarrow (*Achillea millefolium*), California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), onion (*Allium* spp.), blue dicks (*Dichelostemma capitatum*), tidy tips (*Layia* spp.), gumplant (*Grindelia* spp.), tarplants (*Deinandra* spp.), goldenbush (*Isocoma* spp. and *Ericameria* spp.), sugar bush (*Rhus ovata*), and long-stem golden yarrow (*Eriophyllum* spp.) (Mattoni et al. 1997, USFWS 2003, Pratt and Emmel 2010, Preston et al. 2012).

Typically, there is one adult generation of QCB per year, with a four to six week flight period beginning in late February and continuing through May (Emmel and Emmel 1973), although the timing of the flight period may vary considerably from year to year depending on rainfall and

temperature patterns. The life span of adult QCBs averages from 10 to 14 days with staggered emergence (USFWS 2002). The full life cycle of a QCB butterfly includes egg, larva, pupa, and adult with larval stages divided into five to seven instars. Adult QCB spend their time searching for mates, feeding on nectar, defending territories, basking in the sun, and, in the case of females, searching for sites to deposit eggs (USFWS 2002).

### **3. METHODS**

#### ***3.1. VEGETATION COMMUNITY MAPPING***

In autumn 2014, Insignia biologists mapped vegetation communities within the Quino Survey Area as identified in the QCB survey guidelines (USFWS 2014). Biologists noted vegetation communities and boundaries on a hard-copy field map printed at a 1:200 scale which was later recorded as a Geographic Information System (GIS) shapefile using ArcMap software. The minimum mapping unit for upland vegetation communities was generally an acre or less while no minimum mapping unit was established for wetland/riparian communities, to ensure that even very small wetland areas were documented. Vegetation classifications conform to Oberbauer et al. (2008).

#### ***3.2. HABITAT ASSESSMENT***

Shirley Innecken (TE-82480A-0) of Insignia conducted a habitat assessment in September 2014 for the Proposed Project alignment and a 150-foot buffer. The habitat assessment within the 19-acre Elliot Field Station was refined and finalized on February 11, 2015 by RBC biologist Lee Ripma (TE-221290-3.3). Within the 19 acres, 10 acres were determined to be QCB “excluded areas” pursuant to the survey guidelines definition, and nine acres were considered non-excluded/QCB suitable (Figure 2). Excluded areas can include orchards, developed areas, in-fill parcels less than one acre dominated by non-native vegetation, active agriculture, and closed-canopy woody vegetation (USFWS 2014).

#### ***3.3. BUTTERFLY SURVEYS***

On February 2, 2016 a 15-day pre-survey notification letter was sent to the USFWS stating the intent to conduct QCB surveys for the Proposed Project. Surveyors conducted butterfly surveys by walking slowly through non-excluded habitat within the Quino Survey Area and identifying butterflies with the aid of close-focus binoculars. Butterfly nomenclature follows *Butterflies and Moths of North America* ([www.butterfliesandmoths.org](http://www.butterfliesandmoths.org) 2015). The 2016 Quino Survey Areas were visited weekly from February 19 to May 12, 2016 in accordance with QCB survey guidelines (USFWS 2014). RBC biologists Monica Alfaro (TE-05124-2) and Garrett Huffman (TE-20168A-0) conducted surveys on 13 separate protocol survey days, with an average survey speed of 4.8 acres per hour. Survey dates, conditions, and personnel are presented in Table 1, below.

Table 1. Quino Checkerspot Butterfly Survey Dates/Conditions

Survey	Date	Surveyor	Time (Start-End)	Temp (° F) (Start-End)	Cloud Cover (%) (Start-End)	Wind Range (mph) (Start-End)
#1	2/19/16	GH	1145-1315	70-69	10-10	2-6; 3-6
#2	2/25/16	MA	1250-1440	77-89	0-0	1-2; 3-5
#3	3/3/16	MA	1125-1400	73-70	100-100	2-5; 2-5
#4	3/10/16	MA	1055-1330	79-78	10-10	1-3; 1-3
#5	3/17/16	MA	0940-1225	70-84	0-0	1-2; 1-3
#6	3/25/16	MA	1015-1240	74-79	0-0	0-2; 3-5
#7	4/1/16	MA	0945-1150	62-70	65-0	3-5; 1-3
#8	4/5/16	MA	0950-1200	72-82	90-60	2-4; 2-4
#9	4/11/16	MA	1220-1410	70-72	95-85	1-3; 3-5
#10	4/20/16	MA	1100-1300	80-85	0-0	3-5; 1-2
#11	4/27/16	MA	1030-1200	67-70	35-25	3-6; 3-6
#12	5/5/16	MA	1110-1300	66-66	100-100	1-3; 3-8
#13	5/12/16	MA	1115-1245	70-75	0-0	1-3; 2-5

Surveyors: MA = Monica Alfaro; GH = Garrett Huffman

### 3.4. LARVAL HOST PLANTS AND NECTAR SOURCES

Surveyors recorded the locations of QCB host plants using handheld Global Positioning System (GPS) devices. For each occurrence, surveyors noted the larval host plant species, the diameter of the patch, and the density of the patch. Low density is defined as host plant coverage of less than 20% (less than 40 plants per square meter), medium density is defined as host plant coverage 20-50% (40 to 100 plants per square meter), and high density is defined as host plant coverage greater than 50% (greater than 100 plants per square meter). Each surveyor also noted nectar sources present during each surveys on QCB survey forms. Plant nomenclature follows Rebman and Simpson (2014).

## 4. RESULTS

### 4.1. SUITABLE HABITAT AND VEGETATION COMMUNITIES

Dominant vegetation communities within the 19-acre 2016 Quino Survey Area included three primary vegetation communities:

- 1) Chamise chaparral dominated by chamise (*Adenostoma fasciculatum*);
- 2) Coastal sage scrub dominated by California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*) and deerweed (*Acmispon glaber* var. *glaber*); and
- 3) Eucalyptus woodland dominated by *Eucalyptus* spp.

Chamise chaparral and coastal sage scrub habitats within the survey area are open, and consist of stunted, low to mid height shrubs. RBC biologists noted the presence of open patches within these habitats that supported the larval host plant dot-seed plantain and a variety of annual plants

including common goldfields, a potential QCB nectar source. The entire survey area burned during the 2003 Cedar Wild Fire. Redding cobbly loam and Redding gravelly loam soil types have been reported in the study area (USDA Web Soil Survey 2016). These soil types form undulating topography often correlated with open habitats and ponding.

Larval host plants were scattered throughout the Quino Survey Area and tended to be concentrated in openings of shrub-dominated communities (Figure 2). Although there was some overlap in dot-seed plantain and owl's clover presence, the distribution of larval host plants differed throughout the site. Dot-seed plantain was present throughout much of the survey area. In contrast, owl's clover occurred in openings within the central portion of the survey area. Higher densities of taller (1-2 inches) dot-seed plantain individuals were documented within the flatter northern portion of the survey area, and low to medium densities of small dot-seed plantain (0.5-1 inch) were documented in the gently to moderately sloping southern portion. In the southeastern portion of the survey area, dot-seed plantain was almost continuous and consisted of sparsely distributed individuals. In the remaining locations, dot-seed plantain was confined to patches.

#### **4.2. BUTTERFLY SURVEYS**

No QCB were observed during focused surveys. The nine-acre Quino Survey Area supported a moderate diversity of butterfly species in 2016 with a total of 15 butterfly species observed during the 13 surveys (Attachment A). Butterflies observed during focused surveys represent 11% of the documented butterflies in San Diego County (Shiraiwa 2010). The number of butterfly species observed during each survey varied with a high of 7 species (survey five) and low of 3 (survey one and survey six). Commonly observed species include common buckeye (*Junonia coenia*) (10 of 13 surveys), marine blue (*Leptotes marina*) (9 of 13 surveys), Sara orangetip (*Anthocharis sara*) (8 of 13 surveys), and Behr's metalmark (*Apodemia virguliti*) (7 of 13 surveys). A complete list of butterflies observed during each survey is presented in Attachment A and field notes are included in Attachment B.

#### **4.3. LARVAL HOST PLANTS AND NECTAR SOURCES**

Two larval host plants, dot-seed plantain and purple owl's clover were detected in the Quino Survey Area. There were 16 total dot-seed plantain occurrences, 16 with low density and one with medium density. There were 43 total purple owl's clover occurrences, 23 with low density, 10 with medium density, and one with high density. Larval host plants were scattered throughout suitable habitat within the Quino Survey Area and tended to be concentrated in the more open areas of shrub-dominated communities, and in the southern portion of the Quino Survey Area (Figure 2).

Nectar sources for butterflies were present throughout the survey duration, however, they were significantly lower during final surveys. In February and March, QCB larval host plants and nectar sources were abundant and observed throughout the Quino Survey Area. By late April, the numbers of larval host plants declined precipitously due to seasonal senescence brought on by dry, warm conditions. Decreased diversity in available nectar sources was also observed by late April. Documented QCB nectar sources observed during the surveys are detailed in Table 2, below.

Table 2. Quino Checkerspot Butterfly Nectar Sources, February-May, 2016

Scientific Name	Common Name	QCB Larval Host Plant	Documented QCB Nectar Source	General Nectar Source
<i>Acemisson glaber</i> var. <i>glaber</i>	coastal deerweed			X
<i>Allium praecox</i>	early onion		X	
<i>Bahiopsis laciniata</i>	San Diego sunflower			X
<i>Calandrinia breweri</i>	Brewer's calandrinia			X
<i>Calandrinia menziesii</i>	red maids		X	
<i>Castilleja exserta</i> ssp. <i>exserta</i>	purple owl's clover	X		
<i>Ceanothus tomentosus</i>	Ramona-lilac			X
<i>Deinandra fasciculata</i>	fascicled tarweed		X	
<i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>	blue dicks		X	
<i>Eriogonum fasciculatum</i> var. <i>fasciculatum</i>	coast California buckwheat		X	
<i>Eriophyllum confertiflorum</i> var. <i>confertiflorum</i>	long-stemmed golden-yarrow		X	
* <i>Erodium botrys</i>	long-beak filaree			X
* <i>Erodium cicutarium</i>	red-stem filaree			X
* <i>Erodium moschatum</i>	white-stem filaree			X
<i>Gutierrezia californica</i>	California matchweed			X
<i>Lasthenia gracilis</i>	common goldfields		X	
<i>Linanthus dianthiflorus</i>	fairnose ground pink		X	
<i>Plagiobothrys collinus</i> var. <i>gracilis</i>	San Diego popcornflower		X	
<i>Plantago erecta</i>	dot-seed plantain	X		
<i>Sisyrinchium bellum</i>	blue-eyed-grass			X

\* Non-native species

## 5. CERTIFICATION

We certify that the information in this survey report and attached figures fully and accurately represent our work.



Lee Ripma  
TE-221290-3.1



Monica Alfaro  
TE-05124-2

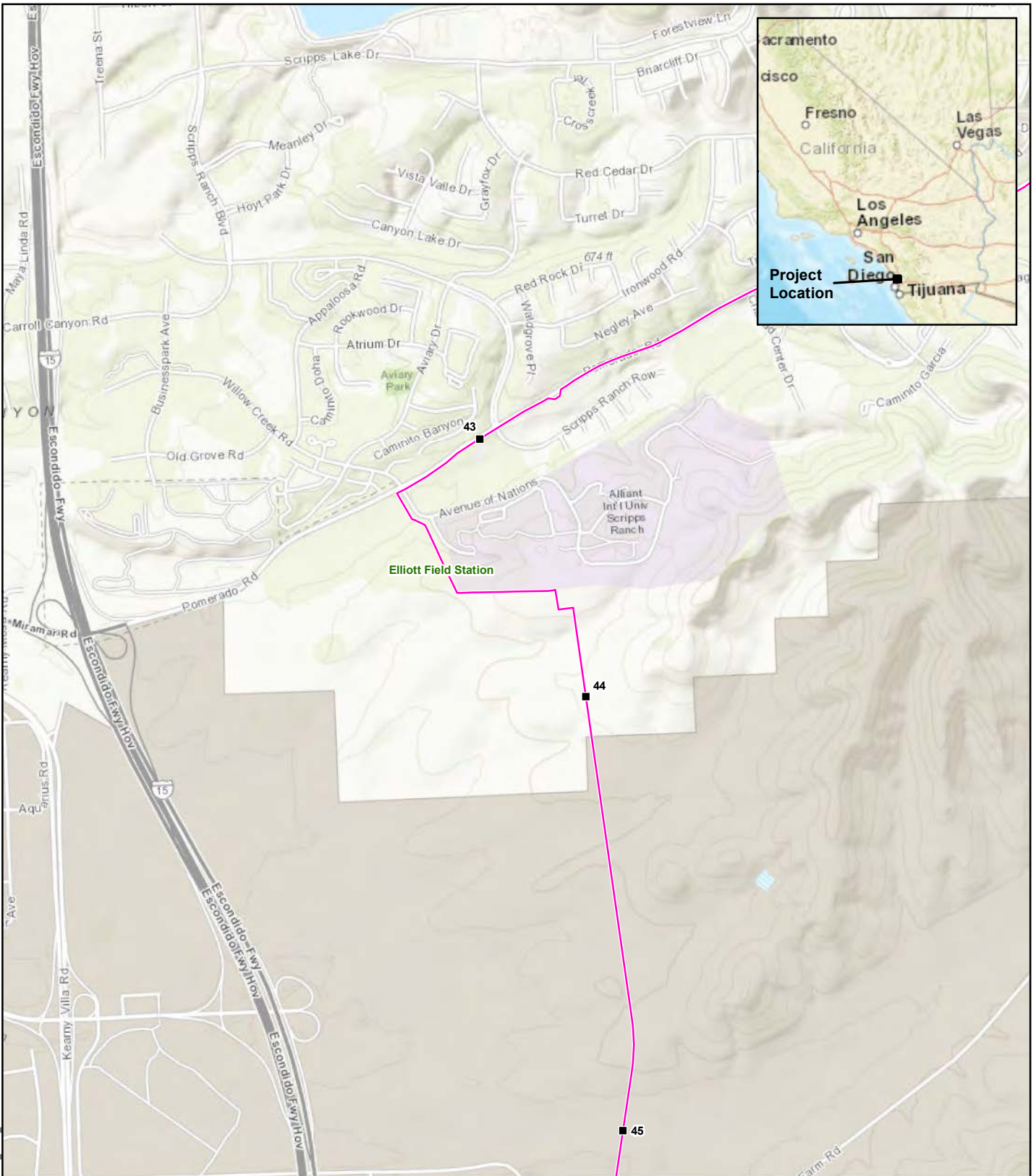


Garrett Huffman  
TE-20168A-0



## 6. REFERENCES

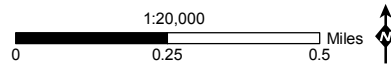
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**Figure 1: Project Overview**

**Line 3602 Natural Gas Transmission Project**

- Milepost
- Proposed Project Route



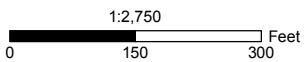


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**Figure 2: Quino Checkerspot Butterfly Suitable Habitat Map**

**Pipeline Safety & Reliability Project**

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li> Project Area (includes a 150-foot buffer from Proposed Project components)</li> <li> 2016 QCB Excluded Survey Areas</li> <li> Low Density dot-seed plantain</li> </ul> | <p><b>QCB larval host plants</b></p> <ul style="list-style-type: none"> <li> owl's clover (<i>Castilleja exserta</i> ssp. <i>exserta</i>) [Low Density]</li> <li> owl's clover (<i>Castilleja exserta</i> ssp. <i>exserta</i>) [Medium Density]</li> <li> dot-seed plantain (<i>Plantago erecta</i>) [Low Density]</li> <li> dot-seed plantain (<i>Plantago erecta</i>) [Medium Density]</li> <li> dot-seed plantain (<i>Plantago erecta</i>) [High Density]</li> </ul> | <ul style="list-style-type: none"> <li> &lt;3m</li> <li> 3 - 10m</li> <li> &gt;10m</li> </ul> |
|--|---|---|



**Attachment A:**  
**Butterflies Observed**

	Survey Number	1	2	3	4	5	6	7	8	9	10	11	12	13
	Date	2/19/16	2/25/16	3/3/16	3/10/16	3/17/16	3/25/16	4/1/16	4/5/16	4/11/16	4/20/16	4/27/16	5/5/16	5/12/16
	Surveyor(s)	GH	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA	MA
Nymphalidae (Brush Footed Butterflies)														
	<i>Junonia coenia</i> (Common Buckeye)		X	X	X	X	X	X	X	X	X		X	
	<i>Vanessa annabella</i> (West Coast Lady)			X					X					
	<i>Vanessa cardui</i> (Painted Lady)	X										X		
	<i>Vanessa virginiensis</i> (American Lady)			X	X	X		X		X			X	
Hesperiidae (Skippers)														
	<i>Erynnis funeralis</i> (Funereal Duskywing)			X		X				X	X		X	X
	<i>Erynnis tristis</i> (Mournful Duskywing)		X						X					
Lycaenidae (Hairstreaks)														
	<i>Brephidium exile</i> (Western Pygmy-Blue)	X												
	<i>Glaucopsyche lygdamus</i> (Silvery Blue)				X	X								
	<i>Leptotes marina</i> (Marine Blue)					X	X	X	X	X	X	X	X	X
	<i>Plebejus acmon</i> (Acmon Blue)				X							X		
	<i>Strymon melinus</i> (Gray Hairstreak)										X	X		X
Riodinidae (Metalmarks)														
	<i>Apodemia virgulti</i> (Behr's Metalmark)		X			X		X	X	X		X	X	
Papilionidae (Swallowtails)														
	<i>Papilio rutulus</i> (Western Tiger Swallowtail)										X			
Pieridae (Whites and Orangetips)														
	<i>Anthocharis sara</i> (Sara's Orangetip)	X	X	X		X	X	X	X	X				
	<i>Phoebis sennae marcellina</i> (Southwest Cloudless Sulphur)												X	X
	Total Butterfly Species Observed	3	4	5	4	7	3	5	6	6	5	5	6	4

**Attachment B:**  
**Surveyor Field Notes**