BioCultural LLC
ENVIRONMENTAL CONSULTANTS

Crotch's Bumblebee Habitat Survey

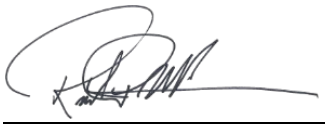
for a 2.75-acre Parcel near Lake Elsinore
Riverside County

(Assessor's Parcel Number 377-372-038)

Prepared by
Biocultural LLC on behalf of
Natural Resources Assessment, Inc.
June 2025

CERTIFICATION

I hereby certify that the statements furnished below and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.



June 12, 2025

Ricardo Montijo
BioCultural LLC

Date

1 INTRODUCTION

A biological resources report was prepared for a 2.75-acre property near Lake Elsinore. Since the completion of the biological documents, the Crotch's bumble bee (CBB) has been designated as a candidate for endangered species status. Commentators have recommended that the CBB be considered and analyzed as part of the project review process. This report evaluates the site conditions of the parcel and assesses the potential habitat for the CBB. It is important to note that this report does not constitute a protocol survey.

1.1 Crotch's Bumblebee (*Bombus crotchii*)

Crotch's bumblebee is native to North America, particularly the western regions of the United States and parts of Canada. This species typically inhabits open grasslands, meadows, and areas with abundant wildflowers, favoring environments that provide ample foraging opportunities. Crotch's bumblebee is often associated with habitats that have a mix of native flora, which supports its role as a pollinator. The species thrives in areas with moderate to high elevations, where it can find suitable nesting sites in the ground, often in abandoned rodent burrows or under dense vegetation (Williams et al., 2014).

The life cycle of CBB follows the typical bumblebee pattern, beginning with the emergence of fertilized queens in early spring. After hibernating through the winter, these queens seek out suitable nesting sites to establish their colonies. Once a nest is established, the queen lays eggs, which develop into workers over several weeks. The workers then take over foraging duties, allowing the queen to focus on reproduction. The colony grows throughout the summer, reaching its peak in late summer when new queens and males are produced. After mating, the new queens enter diapause, while the rest of the colony dies off as temperatures drop in the fall (Goulson, 2010).

Crotch's bumblebee is known to pollinate a variety of flowering plants, with a preference for native species. Key host plants include various members of the Asteraceae (Sunflower) family, such as asters and encelias, as well as plants from the Fabaceae (Pea) family, including clovers and lupines. These plants provide essential nectar and pollen resources that support the

bumblebee's life cycle and contribute to the overall health of the ecosystem. The relationship between CBB and its host plants is crucial for maintaining biodiversity, as effective pollination enhances seed production and plant reproduction, thereby sustaining the habitats in which these bees thrive (Kearns & Inouye, 1997).

1.2 Property Description

The property is situated within the city limits of Lake Elsinore, east of Interstate 15 (Figure 1). Specifically, it is located in Section 30, Township 05 South, Range 04 West, of the Lake Elsinore USGS 7.5-minute Quadrangle (San Bernardino Meridian). The site is positioned southeast of 8th Street, northwest of Highway 74, and east of Conard Avenue (Figure 2).

1.2.1 Geographic Setting

Geology, hydrology, soils, and climate collectively determine the natural botanical composition of a site, which in turn influences the insect assemblage present. Kennedy and Morton (2003) thoroughly describe the geology of the area.

The Elsinore Valley, part of the Elsinore Trough, is a graben situated between the Santa Ana Block to the southwest and the Perris Block to the northeast. This complex graben is divided lengthwise into several smaller sections by transverse faults. It is one of several graben valleys that comprise the Elsinore Trough, formed by the Elsinore Fault Zone. The valley lies between the Wildomar Fault to the east and the Willard Fault to the west, at the base of the Santa Ana Mountains. The natural Lake Elsinore is classified as a sag pond located along the Wildomar Fault.

The parcel is located just east of the Elsinore Trough. A drainage feature, Arroyo del Toro, enters the property at its northeastern corner and flows in a southwesterly direction toward the center of the property (Figure 3). This arroyo ultimately connects to Lake Elsinore. To the west of the parcel, there are rural and sparse industrial and commercial uses, while open fields are found to the east. Highway 74 runs along the southern boundary of the parcel.

The natural slope of the property is oriented to the southwest, mirroring the path of the arroyo. Notably, the northeastern corner of the parcel is higher than the remainder of the property. Elevations range from

Figure 1. Location and Vicinity Map

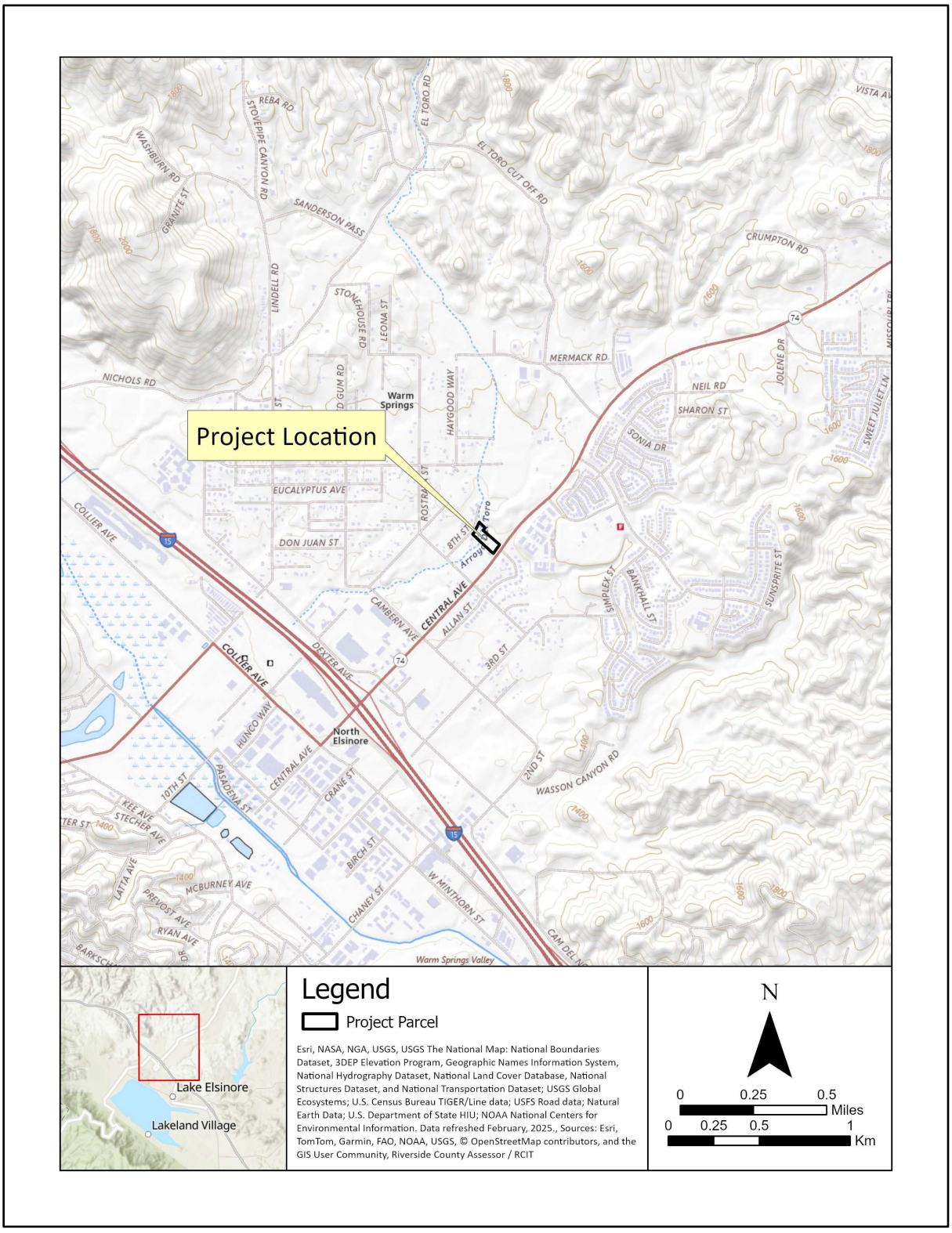
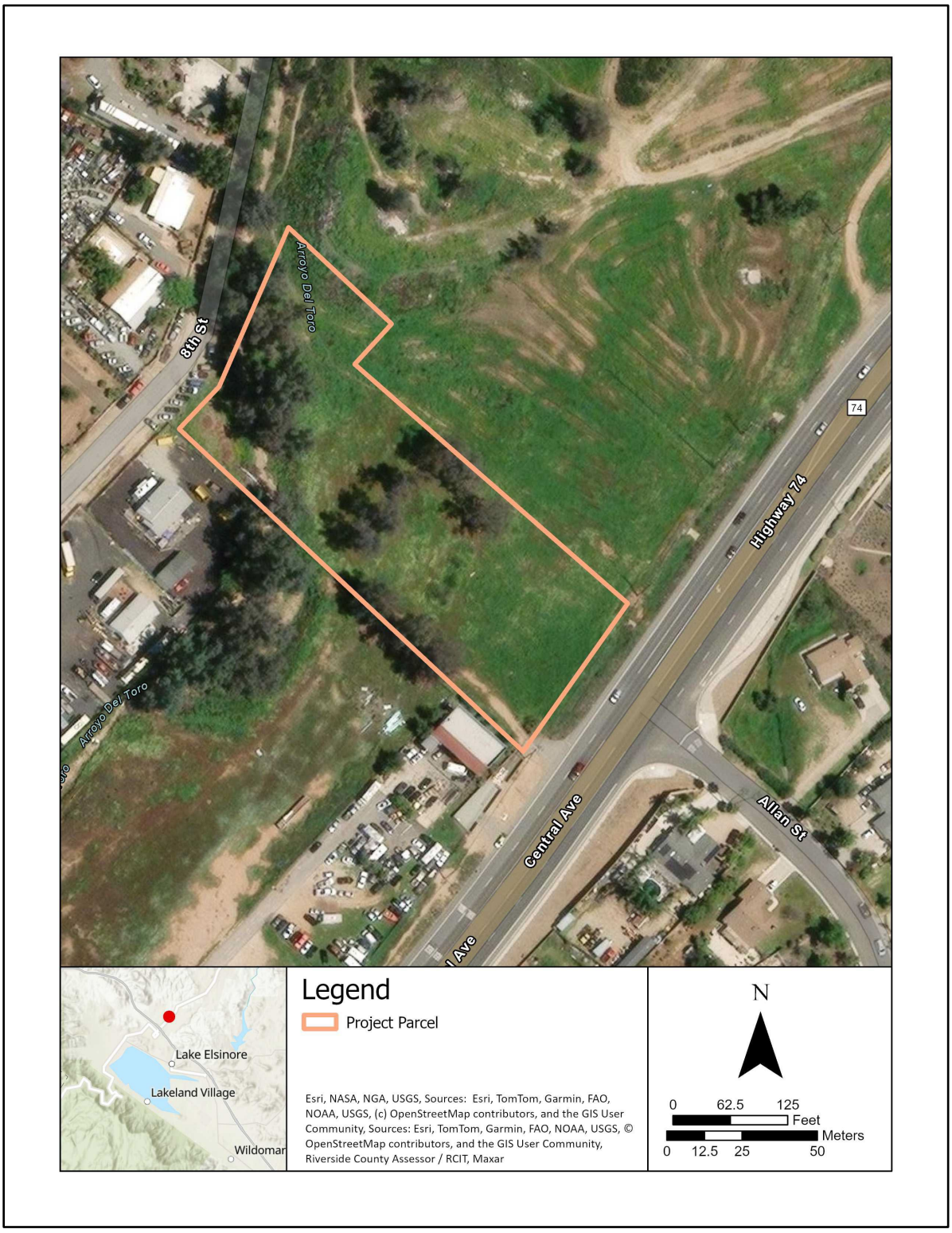


Figure 2. Parcels and Project Site



2 Methods

Prior to the site survey, data was gathered from the California Natural Diversity Database (California Department of Fish and Wildlife, 2025), iNaturalist (2025), and other reference materials provided by the Xerces Society. [1]

On May 1, 2025, biologist Ricardo Montijo from Biocultural LLC, assisted by William Castillo, conducted the site survey. [2] The survey was completed by walking parallel transects across the entire property. Photographs were taken at regular intervals using a field geospatial application and were subsequently processed using ArcGIS Pro 3.5.1. During the survey, the weather reached a peak temperature of 77°F with scattered clouds.

3 Results

3.1 Literature Review

A literature and records review indicates that CBB was found approximately four (4) miles southeast of the project site at Canyon Lake on 23 April 2025 (iNaturalist 2025). The relative proximity to that observation and another observation from 2017 approximately four (4) miles northeast of the site warranted the site's evaluation as potential habitat. Crotch's bumble bee prefers open grassland and scrub but can also persist in semi-natural habitats surrounded by intensely modified landscapes (Love 2010, Williams et al. 2014). Its common foodplants include plants in the genera *Asclepias*, *Chaenactis*, *Lupinus*, *Medicago*, *Phacelia*, and *Salvia* (Williams et al. 2014).

Dispersal occurs primarily in spring by queens while searching for suitable nest sites (Goulson 2010). There is evidence that bumble bees are able to disperse relatively long distances, from at least between 1.6 to over six (6) miles from the colony of origin (Kraus et al. 2008). Dispersing female CBBs could occur on the site, however, no bumblebees were observed during the one day survey.

[1] https://www.bumblebeeatlas.org/pages/california
[2] A biologist with 35 years of experience conducting surveys in California and with bumblebee habitat and species identification training from the Xerces Society.

3.2 Vegetation

The survey revealed that much of the site is covered by non-native annual plants and non-native perennial trees (Figure 3). Non-native grasses and forbs growing on the property included slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), yellow starthistle (*Centaurea melitensis*), red-stemmed filaree (*Erodium cicutarium*), short-pod mustard (*Hirschfeldia incana*), wall barley (*Hordeum murinum*), cheeseweed (*Malva parviflora*), stinknet (*Oncosiphon pilulifer*), and Russian thistle (*Salsola tragus*) (Appendix B. Photograph 1). Native annual plants included fiddleneck (*Amsinckia menziesii*), Jimsonweed (*Datura wrightii*), caterpillar phacelia (*Phacelia cicutarium*), and doveweed (*Croton setiger*).

The site was mapped as Urban Interface by Riverside County but given the prevailing non-natives over most of the site, this species composition conforms to the Wild Oats and Annual Brome Grasslands (*Avena – Bromus* Semi-natural Herbaceous Stands) vegetation type (California Native Plant Society 2025) (Figure 4). The site supports perennial trees including non-native species such as red gum (*Eucalyptus camaldulensis*), Persian lilac (*Melia azederach*) and tamarisk (*Tamarix ramosissima*). Castor bean (*Ricinus communis*) and tree tobacco (*Nicotiana glauca*) are non-native tall shrubs that occur on the parcel. Native shrubs also occur, albeit sparsely and mostly along Arroyo del Toro and on the thinly-covered slopes in the northeastern portion of the property (Figure 4). Native species observed include California buckwheat (*Eriogonum fasciculatum*), sand aster (*Corethrogyne filaginifolia*), western ragweed (*Ambrosia psilostachya*), and western sunflower (*Helianthus annuus*). Areas contiguous with the parcel support fewer than a dozen individual native shrubs.

4 Conclusions and Discussion

Although the Crotch's bumble bee (CBB) can inhabit semi-natural environments surrounded by heavily modified landscapes (Love 2010), ongoing site maintenance and adjacent land uses continue to degrade the on-site habitats (Appendix B, Photograph 5). Historical aerial imagery dating back to 1961 indicates that this area was developed prior to 1978, providing evidence of long-term land use.

Figure 3. Tree and Shrub Distribution on Parcel and 200-foot Buffer

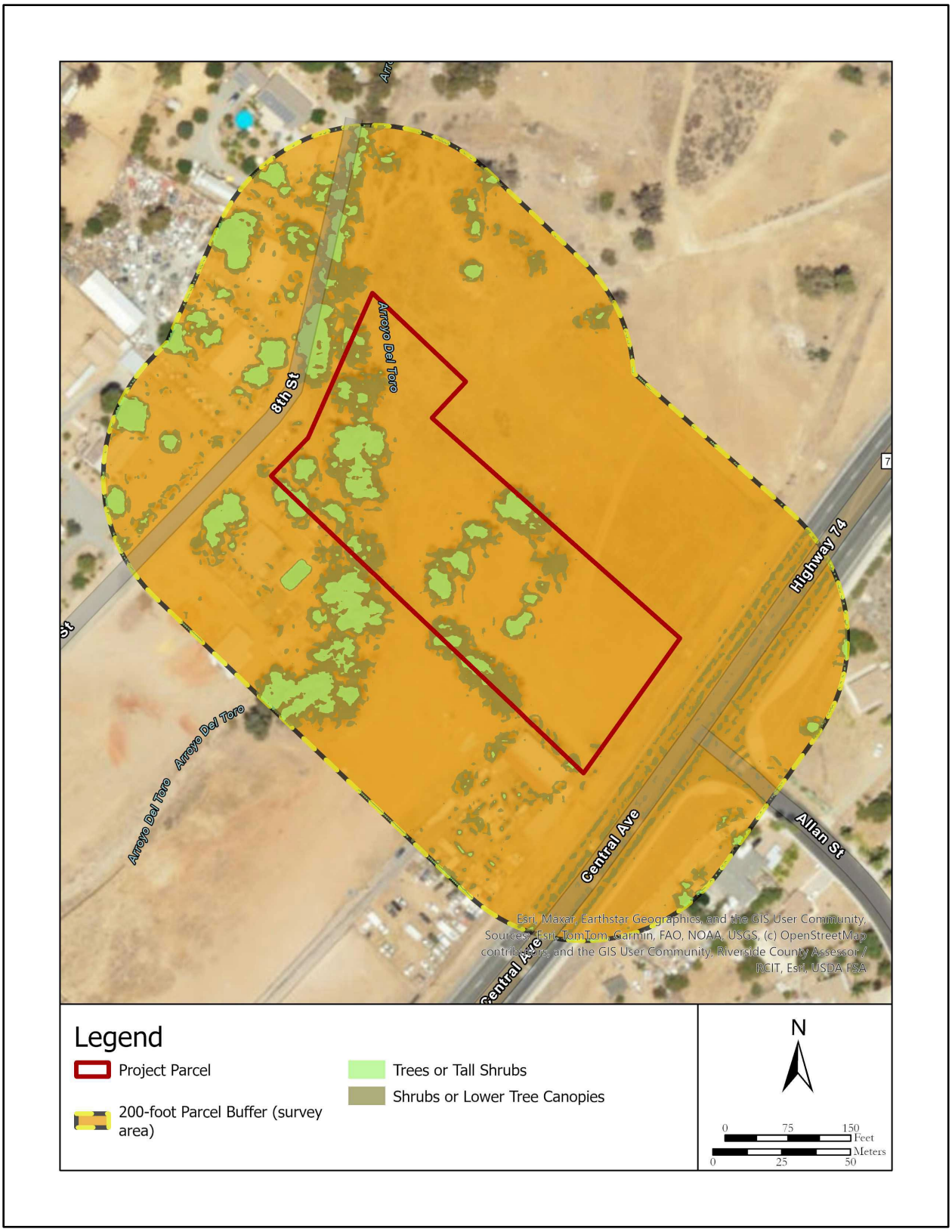


Figure 4. Vegetation

The only known food plants for the CBB on the project site are caterpillar phacelia and California buckwheat. The remainder of the property is maintained for fire safety purposes or is covered by trees that are unlikely to provide suitable habitat for the CBB. Given the limited availability of suitable habitat, it is improbable that the CBB regularly utilizes this site, especially considering the presence of better and more expansive habitats in the surrounding region. Therefore, the project is unlikely to have a detrimental impact on the species.

5 Literature and Sources Cited

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Appendix A

Species Observed

Plants

Latin Name	Common Name
Eudicots	**Flowering Plants**
Anacardiaceae	**Sumac Family**
Schinus molle L.*	Peruvian Pepper
Asteraceae	**Sunflower Family**
Ambrosia psilostachya DC.	Western Ragweed
Baccharis salicifolia (Ruiz & Pav.) Pers.	Mulefat
Centaurea melitensis L.*	Maltese Star Thistle
Corethrogyne filaginifolia (Hook. & Arn.) Nutt. var. *filaginifolia*	Common Sandaster
Helianthus annuus L.	Western Sunflower
Oncosiphon pilulifer (L. f.) Källersjö *	Stinknet
Sonchus oleraceus L.*	Common sow thistle
Boraginaceae	**Borage Family**
Phacelia cicutaria Greene var. *hispida*	Caterpillar Phacelia
Brassicaceae	**Mustard Family**
Hirschfeldia incana (L.) Lagr. -Fossat*	Short-pod Mustard
Chenopodiaceae	**Goosefoot Family**
Salsola tragus L*	Russian Thistle
Convulvulaceae	**Morning Glory Family**
Calystegia macrostegia (Greene) Brummitt *cyclostegia* (House) Brummitt	Coast Morning Glory
Euphorbiaceae	**Euphorb Family**
Croton setiger Hook	Doveweed
Ricinus communis L.	Castor Bean
Geraniaceae	**Geranium Family**
Erodium cicutarium L.*	Red-stemmed Filaree
Lamiaceae	**Mint Family**
Marrubium vulgare L.	Horehound
Meliaceae	**Mahogany Family**
Melia azederach L.	Persian Lilac
Myrtaceae	**Myrtle Family**
Eucalyptus camaldulensis Dehnh. *	Red River Gum
Polygonaceae	**Buckwheat Family**
Eriogonum fasciculatum Benth. var. *foliolosum* (Nutt.) S. Stokes ex Abrams	California Buckwheat
Solanaceae	**Nightshade Family**

Datura wrightii Regel	Jimsonweed
Nicotiana glauca Graham*	Tree Tobacco
Solanum douglasii Dunal.	Douglas' Nightshade
Tamaricaceae	**Salt Cedar Family**
Tamarix ramosissima Ledeb.	Tamarisk
Monocots	**Grasses And Allies**
Poaceae	**Grass Family**
Avena barbata Pott. Ex Link*	Slender Oats
Bromus diandrus Roth*	Ripgut Brome
Bromus madritensis L. ssp. *rubens* (L.) Husn. *	Red Brome
Hordeum murinum L.*	Foxtail Barley

***** Indicates a non-native species.

Wildlife

Insects

Scientific Name	Common Name
Nymphalidae	**Brush-footed Butterflies**
Danaus plexippus	Monarch Butterfly

Reptiles

Scientific Name	Common Name
Phrynosomatidae	**Horned Lizards**
Sceloporus occidentalis	Western Fence Lizard
Uta stansburiana	Common Side-blotched Lizard

Birds

Scientific Name	Common Name
Accipitridae	**Hawks, Eagles, and Kites**
Buteo jamaicensis	Red-tailed Hawk
Aegithalidae	**Long-tailed Tits**
Psaltriparus minimus	Bushtit
Cardinalidae	**Cardinals and Allies**
Passerina amoena	Lazuli Bunting
Cathartidae	**New World Vultures**
Cathartes aura	Turkey Vulture
Charadriidae	**Plovers and Lapwings**
Charadrius vociferus	Killdeer
Fringillidae	**Finches, Euphonias, and Allie**

Haemorhous mexicanus	House Finch
Spinus psaltria	Lesser Goldfinch
Spinus lawrencei	Lawrence's Goldfinch
Spinus tristis	American Goldfinch
Spinus psaltria	Lesser Goldfinch
Hirundinidae	**Swallows**
Petrochelidon pyrrhonota	Cliff Swallow
Icteridae	**Troupials and Allies**
Icterus bullockii	Bullock's Oriole
Parulidae	**New World Warblers**
Setophaga petechia	Yellow Warbler
Setophaga coronata	Yellow-rumped Warbler
Parulidae	**New World Warblers**
Melozone crissalis	California Towhee
Passerellidae	**New World Sparrows**
Dryobates pubescens	Downy Woodpecker
Ptiliogonatidae	**Silky-flycatchers**
Phainopepla nitens	Phainopepla
Trochilidae	**Hummingbirds**
Calypte anna	Anna's Hummingbird
Turdidae	**Thrushes and Allies**
Sialia mexicana	Western Bluebird
Tyrannidae	**Tyrant Flycatchers**
Myiarchus cinerascens	Ash-throated Flycatcher

Mammals

Scientific Name	Common Name
Leporidae	**Rabbits and Hares**
Sylvilagus audubonii	Desert (Audubon's) Cottontail

Appendix B

Photographs

Photograph 1. This east-facing photograph illustrates the dominant Wild Oats and Annual Brome Grasslands Alliance vegetation on the property.

Photograph 2. The spatial dominance of grasslands and weedy fields and presence of non-native trees is highlighted in this photograph .

Photograph 3. This roughly west-facing photograph shows the typical understory beneath the red gum trees.

Photograph 4. A single California buckwheat under the red gum canopy near the primary site access at the southwestern edge of the parcel.

Photograph 5. This aerial image of the site was taken in June 2024. It shows the discing performed for fire safety on the property. Note the furrows over most of the property except for Arroyo del Toro. Source: Google Earth, 2025.