11190 S. RIVERSIDE AVENUE

CITY OF RIALTO, SAN BERNARDINO COUNTY, CALIFORNIA

Delhi Sands Flower-Loving Fly Habitat Suitability Assessment

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The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.

Thomas J. McGill, Ph.D.
Managing Director
ELMT Consulting

January 2023

Executive Summary

This report contains the findings of an updated habitat suitability assessment for the Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*; DSF), a federally endangered species, for the proposed Project Site located at 11190 S. Riverside Avenue within Assessor Parcel Number (APN) 0258-121-23 in the City of Rialto, San Bernardino County, California. The purpose of this assessment was to examine the existing conditions on the proposed Project site and determine if the site supported clean Delhi Sand soils capable of supporting DSF. The habitat suitability assessment fieldwork was conducted by Thomas J. McGill, Ph.D. (ELMT Consulting) on November 7, 2022.

The project site is mapped by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey as supporting Delhi fine sand soils.

The site has been developed for use of the site as a truck depot/storage yard and remained in use for trucking for several decades. This has required that the property be periodically graded and leveled. In addition to grading the site, most of the project site has been either paved or gravel and an oil-based slurry applied. Open soils on the site are limited to narrow bands of soils at the base of boundary fences on the northern, western, eastern, and southern boundaries. Vegetation along the northern, western, and southern boundaries are periodically graded or disked and covered with gravel for dust abatement. Soils along the fence lines have been contaminated by the grading, application of gravel, or the compacted by the long-standing use of the site as a truck depot. Small patches of ruderal and native vegetation exist along the fence lines on the northern, western and southern boundaries. The nearest known Delhi Sands Flower-loving Fly observation was located approximately ½ mile north of the site. The quality of the open Delhi Sand soils found at the base of the fence lines along periphery of the site was considered low or very low in quality and was assigned a suitability rating of 2. Focused surveys for DSF have been conducted on the property in 2018, 2019, 2020 and 2022. All surveys have been negative. Given the negative results from focused surveys and low quality of habitat, it is reasonable to assume the area open areas on the project site do not support DSF.

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Section 1 Introduction

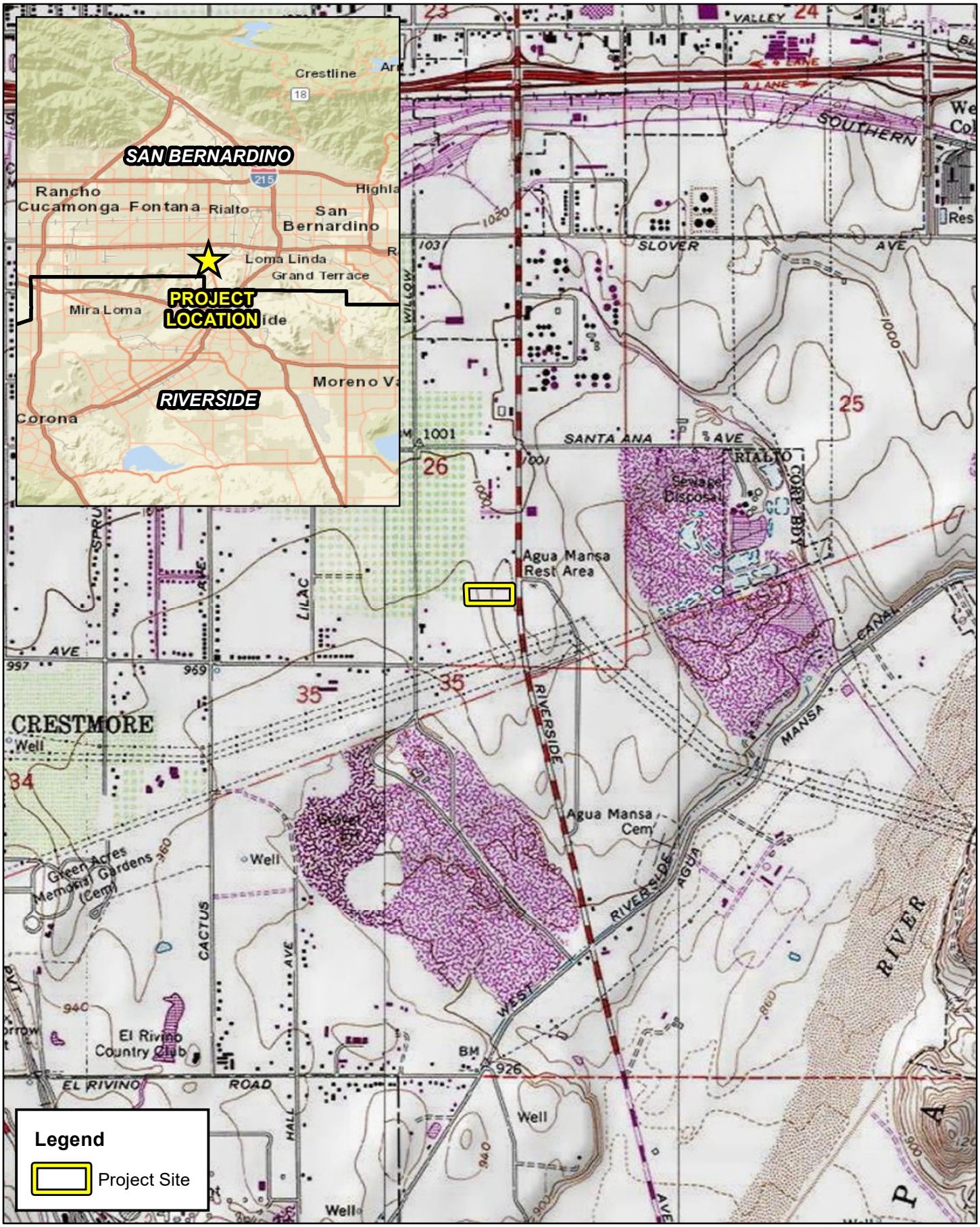
ELMT Consulting (ELMT) conduced a Delhi Sands Flower-loving Fly (DSF) Habitat Suitability Assessment for a proposed project site at TBD Archibald Avenue in the City of Ontario, San Bernardino County, California. Thomas J. McGill, Ph.D., inventoried the project site to determine the suitability ratings of the Delhi Sands habitats on November 7, 2022. This assessment was conducted to determine the extent to which the soils on the project site support clean Delhi fine sand soils capable of providing suitable habitat for DSF, quantify the amount of such habitat, and determine the general location and distribution of such soils within the project site boundaries.

1.1 PROJECT LOCATION

The project site is generally located on the west side of Riverside Drive, north of Santa Ana Avenue, in the City of Rialto, San Bernardino County, California. The site is depicted on San Bernardino South quadrangle of the United States Geological Survey's (USGS) 7.5-minute map series within Section 26 of Township 1 South, Range 5 West (Exhibit 1, *Project Vicinity*). Specifically, the project site is located southwest of the intersection of Riverside Avenue and Industrial Drive within APN 0258-121-23 (Exhibit 2, *Project Site*). The project site is approximately 3.3 acres in size and rectangular in shape.

1.2 PROJECT DESCRIPTION

The project is the conversion of this industrial site and the two adjacent sites (2830 S. Riverside Avenue and 11258 S. Riverside Avenue) to commercial use though the construction of a concrete tilt-up warehouse building with office component totaling approximately 219,000 square feet on the combined 10.11 gross acres of land with secured loading dock area and truck trailer stalls within secured yard. Building allows for a multi-tenant with truck and auto entries located on Riverside Ave.



DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
11190 S. RIVERSIDE AVENUE

Regional Vicinity

ELMT CONSULTING

0 0.25 0.5 1 Miles

Source: USA Topographic Map, San Bernardino County

Exhibit 1

DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
11190 S. RIVERSIDE AVENUE

Project Site

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, San Bernardino County

Exhibit 2

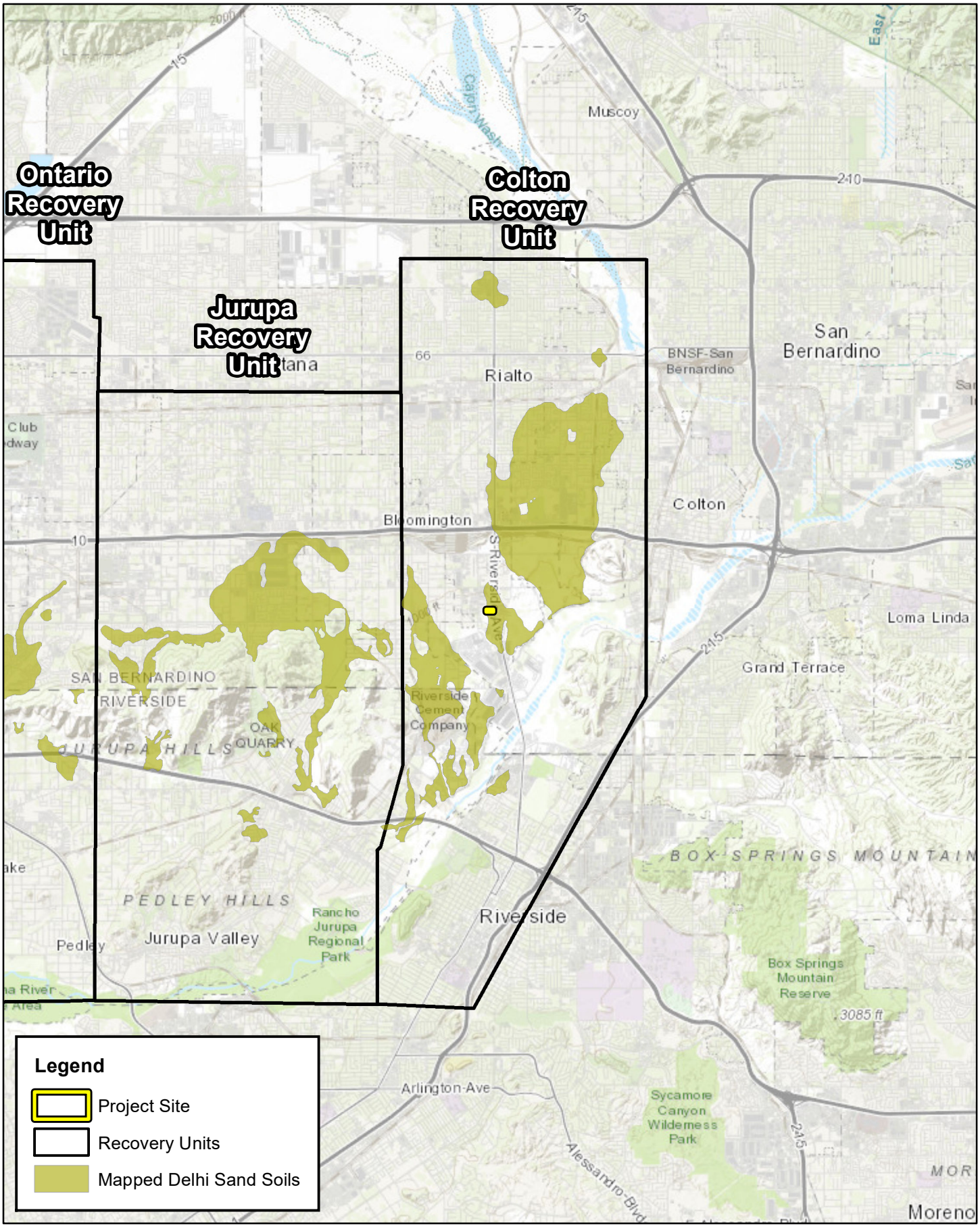
Section 2 Background

It has been generally acknowledged that DSF can be found to occur in Delhi sand soils, particularly clean dune formations composed of Aeolian sands. Conversely, soils and sands deposited by fluvial processes from the surrounding alluvial fans do not support DSF. These alluvial soils are composed of course sands, cobble and gravel (Tujunga soils) or coarse sands, silts and clays (Cieneba soils). In this part of San Bernardino County, the separation of soil types has been lost due to the mixing and cross contamination from years of agricultural activities, development, and other man-made disturbances.

Depending on the extent of mixing and contamination, some areas formally mapped as Delhi sand soils no longer have potential to support DSF populations. Conversely, some areas formally mapped as Cieneba soils may now supported wind deposited Delhi sand soils and have potential to support DSF. Six DSF experts (Ken Osborne, Greg Ballmer, Rudy Matoni, Karin Cleary-Rose, Alison Anderson and Tom McGill) used this criterion, the relative abundance of clean Delhi sand soils versus the amount of Cienba or other alluvial soils, to rate the suitability of the habitat to support DSF (Michael Brandman Associates, 2003). Soils high in gravel and alluvial materials, or high in fine materials such as silts and clays, were rated low, while soils that appear to be high in Aeolian deposited sands were rated high. This qualitative assessment of DSF habitat was further refined by considering the relative degree of soil compaction. Alluvial soils have a tendency to solidify to a hard surface pavement, while Aeolian soils are easier to penetrate and provide good substrate for DSF.

Although it has been common to attribute the presence of four common plant species California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), deer weed (*Acmispon glaber*), and telegraph weed (*Heterotheca grandiflora*) as indicators of habitat suitability, for the assessment, vegetation composition was not given much weight in making this habitat evaluation. These dominant plant species, and plant species composition of habitats, may not be directly relevant to larval development (due to likely predatory or parasitic nature of DSF larvae) (Osborne, et al. 2003). The known immature life histories of the nine asiloid fly families, including that to which the DSF is classified, are primarily predatory and/or parasitic on other invertebrate species (mainly insects) and the presence or absence of plant species appears not to be relevant to the life history of these flies.

Land with suitable DSF habitat includes only those areas with open, clean, and unconsolidated Delhi Series soils that have not been permanently altered by residential, commercial, or industrial development, or other human actions. Areas known to contain Delhi sand soils and/or to be occupied by DSF have been divided by USFWS into three recovery units (Colton, Jurupa, and Ontario Recovery Units (USFWS, 1997)). These recovery units are defined as large geographic areas based on geographic proximity, similarity of habitat, and potential genetic exchange. The project site is in the Colton Recovery Unit.



DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
11190 S. RIVERSIDE AVENUE

DSF Recovery Units

ELMT CONSULTING

0 1 2 4 Miles

Source: World Topographic Map, Riverside County

Exhibit 3

Section 3 Methodology

The criteria discussed in detail below were used to rate the relative abundance of clean Delhi sand soils verses the amount of Cieneba Tujunga, or other alluvial soils, to rate the suitability of the habitat to support DSF. Soils high in gravel and alluvial materials, or high in fine materials such as silts and clays, were rated low, while soils that appear to be high in Aeolian deposited sands were rated high. This qualitative assessment of DSF habitat was further refined by considering the relative degree of soil compaction. Alluvial soils have a tendency to solidify to a hard surface pavement, while Aeolian soils are loose sandy soils that are easier to penetrate and provide good substrate for DSF.

3.1 SOIL

Onsite and adjoining soils were researched prior to the field visit using the United States Department of Agricultural (USDA) Natural Resources Conservation Survey (NRCS) Soil Survey for San Bernardino County, California. In particular, the USDA NRCS was reviewed to determine the location of mapped Delhi fine sand soils on or within the immediate vicinity of the project site.

3.2 VEGETATION

Vegetative resources and surrounding land uses were also assessed as part of determining baseline conditions by walking meander transects and recording all species observed and adjacent land uses. Common plant species observed during the field investigation were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less-familiar plants were photographed in the field and identified in the laboratory using taxonomic guides. Taxonomic nomenclature used in this study follows the 2012 Jepson Manual (Hickman 2012). In this report, scientific names are provided immediately following common names of plant species (first reference only).

3.3 HABITAT SUITABILITY ASSESSMENT

The scope of the updated habitat suitability assessment was to determine the continued presence and distribution of consolidated and unconsolidated soils and to further evaluate the quality of Delhi Sands across the site as it pertains to DSF. ELMT biologist Tom McGill surveyed the project site on November 7, 2022.

The habitat suitability assessment consisted of a visual and tactile inspection of all areas on the project site that contain Delhi sand soils. Areas of open soils within the project site are mapped as Delhi fine sands. The site was evaluated for the quality or purity of Delhi Sands and for its potential to support DSF. Areas were assigned one or more ratings ranging between 1 and 5, with 5 being the best quality and most suitable habitat:

1. Soils dominated by heavy deposits of alluvial material including coarse sands and gravels with little or no Delhi sand soils and evidence of soil compaction. Developed areas, non-Delhi sands

soils with high clay, silt, and/or gravel content. Delhi sands extensively and deeply covered by dumping of exotic soils, rubble, trash or organic debris. *Unsuitable.*

2. Delhi sand soils are present, but the soil characteristics include a predominance of alluvial materials (Tujunga Soils and Hilmar loamy sand), or predominance of other foreign contamination. Sever and frequent disturbance (such as maintenance yard or high use roadbed). *Very Low Quality*.

3. Although not clean, sufficient Delhi sand soils are present to prevent soil compaction. Moderately contaminated Delhi sands. Delhi sands with moderate to high disturbance (such as annual disking). Sufficient Delhi sands are present to prevent soil compaction (related to contamination by foreign soils). Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality*.

4. Abundant clean Delhi sand soils with little or no foreign soils (such as alluvial material, Tujunga soils or Hilmar loamy sand) present. Moderate abundance of exposed sands on the soil surface. Low vegetative cover. Evidence of moderate degree of fossorial animal activity by vertebrates and invertebrates. May represent high quality habitat with mild or superficial disturbance. *Moderate Quality*.

5. Sand dune habitat with clean Delhi sand soils. High abundance of exposed sands on the soil surface. Low vegetative cover. Evidence (soil surface often gives under foot) of high degree of fossorial animal activity by vertebrates and invertebrates. Sand associated plant and arthropod species may be abundant. *High Quality*.

It should be noted that habitat qualities often vary spatially within a site so that conditions on a site fall within a range of qualities. Further, overall habitat quality is affected by the overall habitat value of a site.

DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
11190 S. RIVERSIDE AVENUE

Soils

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, Soil Survey Geographic Databases, San Bernardino County

Exhibit 4

Section 4 Results

4.1 EXISTING CONDITIONS

The proposed project site is a developed property in the City of Rialto, southwest of intersection of Riverside Avenue and Industrial Way. The site is bounded to the north, west, south, and east by existing Industrial Development (See Exhibit 3, *Project Site*). The site is comprised of Delhi Sand soils.

The site has been subjected to maintenance activities associated with the use of the site as a storage yard for large truck. This has required that the property be periodically graded and leveled. In addition to grading the site, gravel and black slurry or asphalt paving has been periodically applied to the site, to stabilize the graded surface soils between grading events. Grading events have mixed the gravel and asphalt into the underlying soils. As a result, the areas of open soils within the project site have been contaminated by the grading and compacted by the long-standing use of the site as a truck depot and is generally devoid of vegetation. Small patches of ruderal and native vegetation exist along the fence lines on the northern, western, and southern and eastern boundaries. Open Delhi soils are found at the base of chain link fences located along the perimeter of the site. The nearest known Delhi Sands Flower-loving Fly observation was located approximately ½ mile north of the site.

4.2 SUITABILITY ASSESSMENT

Dr. McGill examined of the soil quality on the project site on November 7, 2022, using the referenced DSF habitat suitability scale (Ballmer, Osborne, McGill 2003). The 3.3 acres of the project site is mapped by NRCS as supporting Delhi Sand soils. Due to the historic and ongoing use of the site as a truck depot, the areas of open clean Delhi Sand soils are limited to the fence lines on the northern, western, and eastern boundaries. An undisturbed Colton Dunes plant community, needed by DSF, does not exist on the site. The site supports one (1) land cover type, developed.

The Delhi Sand soils along the fence line at the boundaries have been repeatedly disturbed by the storage of truck along the fence, maintenance activities, and stockpiling of soils. The quality of the open Delhi Sand soils found at the base of the fence lines along periphery of the site was considered low quality and very low quality and were assigned suitability ratings of 2. Focused surveys for DSF have been conducted on the property in 2018, 2019, 2020 and 2022. All surveys have been negative. Given the negative results from focused surveys and the low and very low quality of habitat, it is reasonable to assume the area open areas on the project site do not support DSF and would not be expected to support DSF in the future.

DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
11190 S. RIVERSIDE AVENUE

DSF Habitat Suitability

ELMT CONSULTING

0 250 500 1,000 Feet

Source: ESRI Aerial Imagery, San Bernardino County

Exhibit 5

Section 5 Summary and Conclusion

The project site has used as a trucking depot that includes storage of trucks, maintenance and repair. Delhi Sand soils are found only along the perimeter of the site and were assessed on November 7, 2022, using the referenced DSF habitat suitability scale (Ballmer, Osborne, McGill 2003) to determine if any of the areas of open Delhi Sand soils capable of supporting a population of DSF. The interior the project site has been graded and were paved and/or treated with a soil-based slurry for several decades and no longer provides open Delhi Sands with the exception the Delhi Sands found along the base of the fence line along the perimeter of the site has been repeatedly disturbed by the storage of trucks and maintenance of the project site. Although the areas of Delhi Sand along the fence line are open habitat, they are very low or low in quality and were assigned a suitability ratings of 2. These areas are not expected to support DSF. Four focused surveys for DSF have been conducted on the property since 2018 with all surveys being negative. Given the negative results from focused surveys, the ongoing disturbance and the overall very low and low quality of habitat, it is reasonable to assume the area open areas on the project site do not support DSF and that they would not be expected to be occupied in the future, without significant restoration and management of the site.

Section 6 References

Michael Brandman Associates. 2003. Delhi Sands Flower-loving Fly Habitat Assessment for the Fontana Business Center.

Osborne, K.H. 2002a. Focused surveys for the Delhi Sand giant flower-loving fly (*Rhaphiomidas terminatus abdominalis*) on a 125-acre portion of the Fontana Business Center site. Submitted to USFWS October 15, 2002.

U.S. Department of Agriculture, Natural Resources Conservation Service. 2021. *Web Soil Survey.* Online at http://websoilsurvey.nrcs.usda.gov/app/.

U.S. Fish and Wildlife Services. 1996. Habitat Conservation Plan in support of the issuance of a Section 10(a) permit for incidental take of the endangered Delhi Sands Flower-Loving Fly (*Rhaphiomidas terminatus abdominalis*) in connection with the completion of the Cantara residential project in the City of Colton, California.

U.S. Fish and Wildlife Services. 1997. Final Recovery Plan for Delhi Sands Flower-Loving Fly (*Rhaphiomidas terminatus abdominalis*) U.S. Fish and Wildlife Services, Portland, Or. 51 pages.

U.S. Fish and Wildlife Service. 2019. Recovery Plan Amendment for Delhi Sands Flower-Loving Fly (*Rhaphiomidas terminatus abdominalis*).

U.S. Fish and Wildlife Services. 2008. Delhi Sands Flower-Loving Fly (*Rhaphiomidas terminatus abdominalis*) 5-Year Review: Summary and Evaluation. Carlsbad, California. March 2008.

Appendix A Site Photographs

Photograph 1. Looking west from the eastern boundary. The site is paved or covered with gravel. Open Delhi Sands occur at the base of the perimeter fence lines around the site. Sands are moderately to heavily impacted by truck storage, contaminated with industrial waste, and mixed with gravel.

Photograph 2. Looking south from the northern boundary of the site at the southern boundary. Stockpiles of soil and asphalt can be seen in the top left corner of the site.

Photograph 3. Looking west along the northern boundary. Very little open Delhi Sands occur in the northeastern quadrant of the Project Site.

Photograph 4. Looking north from the northeast corner of the site along eastern boundary. Open Delhi Sands are impacted by stockpiling soils and contaminated with industrial waste and gravel. Riverside Avenue is in the top right of the photo.

Photograph 5. Looking east from the northwest corner of the site along the northern boundary. Open Delhi Sands occur along the western portion of the northern fence line but are heavily impacted by truck storage, contaminated with industrial waste, and mixed with gravel.

Photograph 6. Looking west at the western boundary. A narrow band of open Delhi Sands occurs along the fence line but is heavily impacted by truck storage and contaminated with industrial waste.