2830 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 a 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 2830 S. Riverside Avenue within Assessor Parcel Number (APN) 0258-121-33 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 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 project site has been paved with asphalt and used as an industrial storage yard/trucking depot for several decades. There are two buildings onsite, one is a repair building in the western portion of the property and the other is an office building in the eastern portion. Narrow bands of Delhi Sand soils, 1 to 5 feet wide, occurs along the northern, western, and southern boundary at the base of the boundary fence with adjacent properties. There is less than 0.5-acre of exposed Delhi Sands with minimal mixed native and ruderal vegetation. The site supports one (1) land cover type that is classified as developed.

The site has been developed for use as a truck depot/storage yard and has remained in use as trucking depot for several decades. The fence lines along the northern, western, and southern boundaries are periodically graded or disked and covered with gravel for dust abatement. Delhi Sands along the fence lines have been contaminated by the grading, application of gravel, or compacted by the long-standing use of the site as a truck depot. 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 very low to low quality and was assigned a suitability rating of 2. Focused surveys were conducted in 2022 and were negative. Given the negative results from focused surveys and very low and low quality of habitat, it is reasonable to assume the open areas on along the fence lines do not support DSF.

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Section 1 Introduction

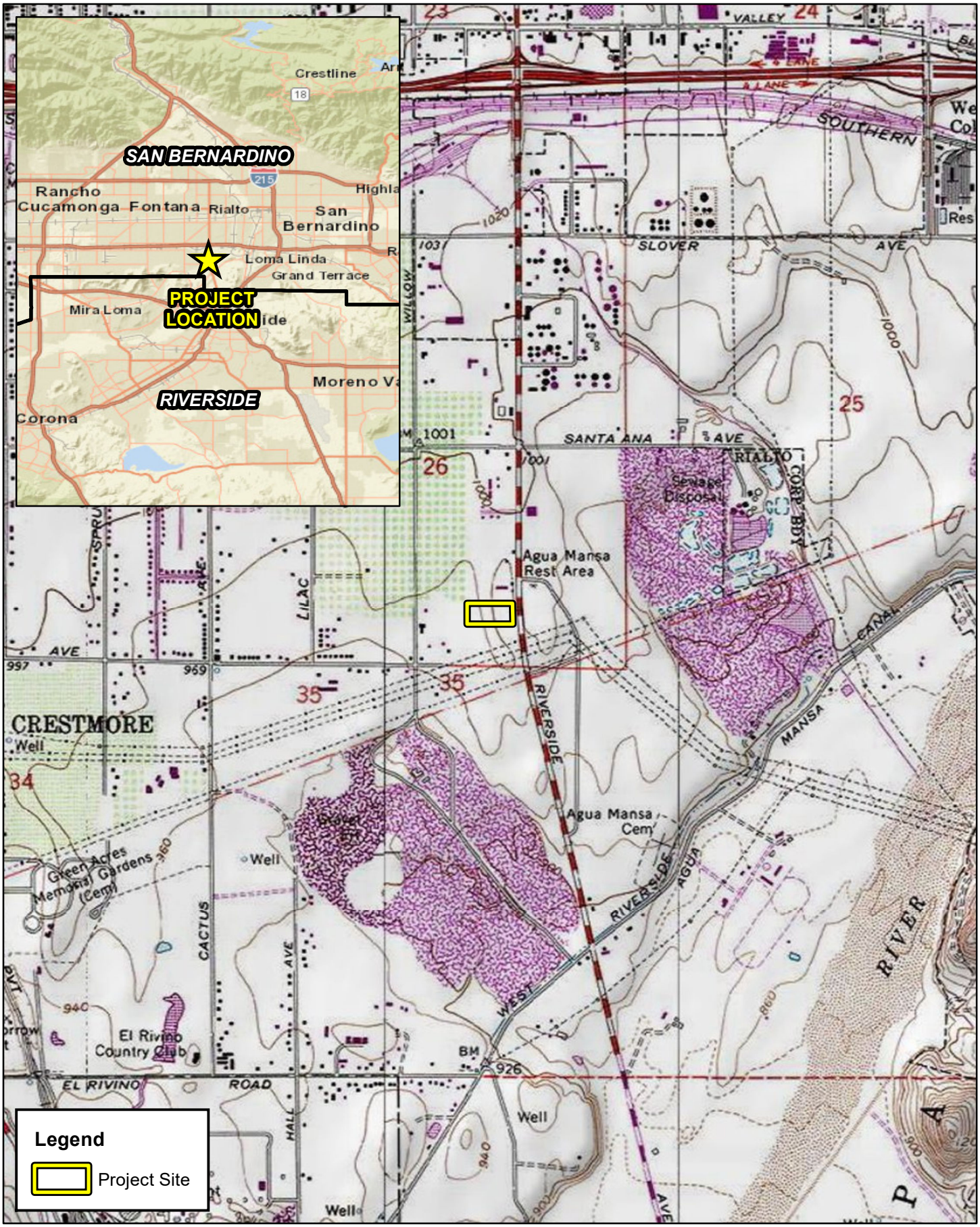
ELMT Consulting (ELMT) conduced a Delhi Sands Flower-loving Fly (DSF) Habitat Suitability Assessment for a proposed project site in the City of Rialto, San Bernardino County, California. Thomas J. McGill, Ph.D., inventoried the project site to determine the suitability ratings of the Delhi Sands habitats 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 and to determine the general location and distribution of such soils within the project site.

1.1 PROJECT LOCATION

The project site is generally located at 2830 S. Riverside Drive, north of Agua Mansa 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, *Site Vicinity*). Specifically, the project site is located southwest of the intersection of Riverside Avenue and Industrial Drive within Assessor Parcel Number (APNs 0258-121-33) (Exhibit 2, *Project Site*). The project site is approximately 3.5 acres in size and is rectangular in shape.

1.2 PROJECT DESCRIPTION

The project is the conversion of this industrial site and the two adjacent sites (11190 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 a secured yard. Building allows for multi-tenants with truck and auto entries located on Riverside Ave.



DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
2830 S. RIVERSIDE AVENUE

Regional Vicinity

ELMT CONSULTING

Source: USA Topographic Map, San Bernardino County

Exhibit 1

DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
2830 S. RIVERSIDE AVENUE

Project Site

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, San Bernardino County

Exhibit 2

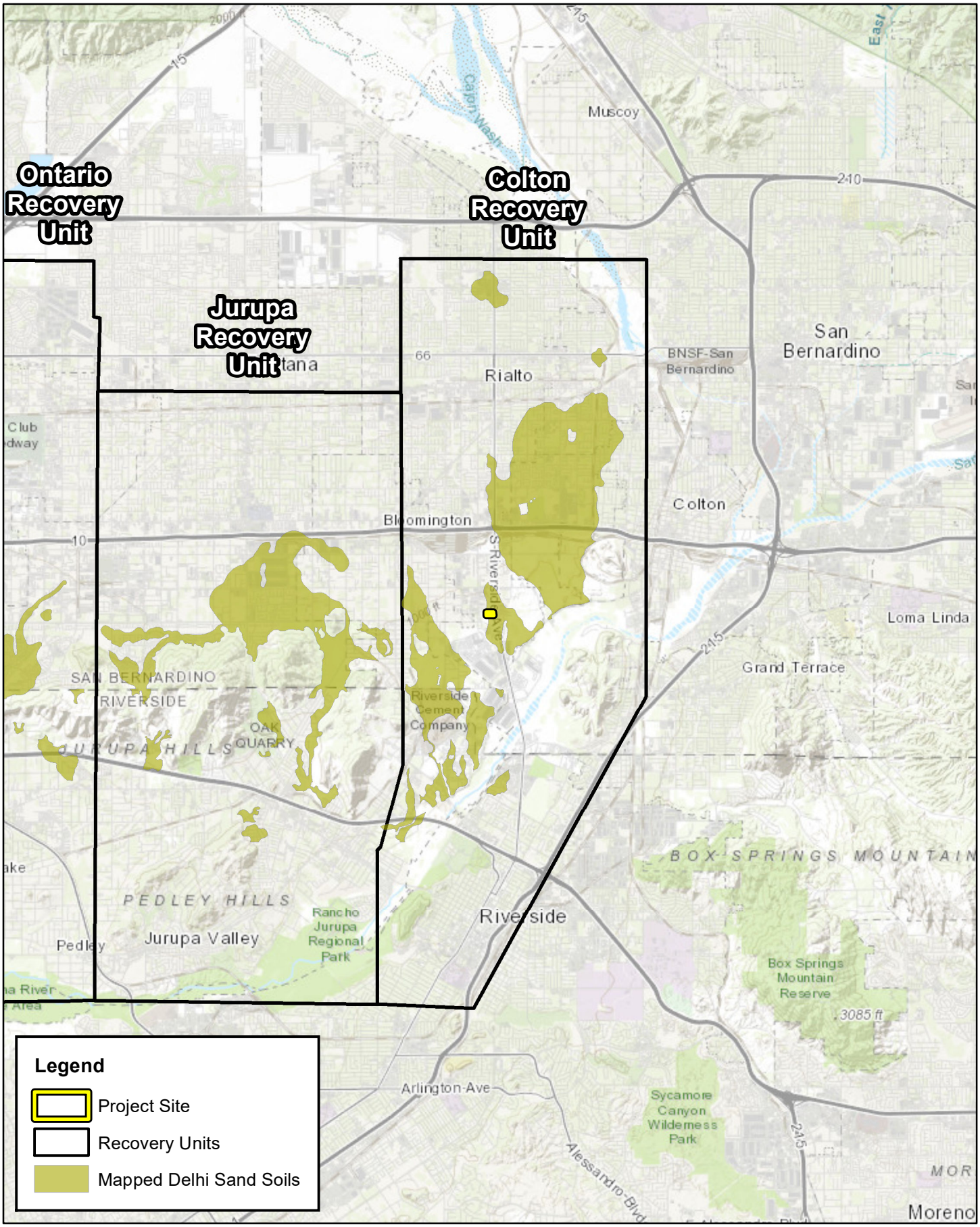
Section 2 Background

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.



DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
2830 S. RIVERSIDE AVENUE

DSF Recovery Units

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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 Thomas J. McGill, Ph.D. 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. Open areas with exposed Delhi Sand soils within the project site are restricted to the base of the boundary fence that surrounds the property on all four sides (Exhibit 3, *Project Site*). 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
2830 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 an undeveloped property in the City of Rialto, southwest of intersection of Riverside Avenue and Industrial Way. The site is bounded on the north, west, south, and east by existing Industrial Development. The site has been in industrial use for several decades, primarily trucking storage, maintenance and repair. The site has been paved with asphalt with open Delhi Sands only occurring in narrow band, 1 to 5 feet in width, at the base of a fence line at the north, west, and south boundary. Mixed native and ruderal vegetation is minimal within the open soil along the three fence lines. The eastern boundary has been developed with curb and gutter and provides access to the property.

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 underlying soil is mapped by NRCS as Delhi Sand soils but has been covered by pavement for several decades. Only a narrow band of open Delhi Sand soils occur along the fence lines at the north, west, and south boundaries. The properties to the north, west, and south are developed for truck storage and as a maintenance and repair facility. Delhi Sands occur at the base of the fence lines along the north, west and east boundaries. The narrow band of Delhi Sand soils along the north, west and south boundary has been repeatedly disturbed by the storage of truck along the fence and maintenance activities, is very low quality and was assigned a suitability rating of 2. Delhi Sand soils does not occur along the east boundary which has been developed with curb and gutters.

DELHI SANDS FLOWER-LOVING FLY SUITABILITY ASSESSMENT
2830 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 been paved for several decades and is used as a trucking depot that includes storage of trucks, maintenance and repair. Open Delhi Sand soils found along the north, west, and south boundaries 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 Sands were capable of supporting DSF. The project site has been paved for several decades and no longer provides open Delhi Sands with the exception of narrow bands of Delhi Sands found along the base of the fence line at the north, west, and south boundaries. Although the areas of Delhi Sand along the fence lines are open habitat, they subjected to grading and stockpiling of soils mixed with gravel, as well s compaction from the storage of trucks along the fence line. Due to this level of disturbance the open Delhi Sands along the fence lines were rated as very low or low quality and were assigned a suitability rating of 2 and 3. These areas are not expected to support DSF. Focused surveys for DSF in 2022 were 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.

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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 north from the northeast corner of the Project Site. The site is paved with gravel along the eastern boundary in the foreground. Riverside Avenue can be seen in the top right corner of the photo.

Photograph 2. Looking west along the southern boundary at the southwest corner of the site. Delhi Sands occur at the base of the fence line and is moderately impacted by truck storage and contaminated with industrial waste and gravel.

Photograph 3. Looking south along the western boundary of the site. Delhi Sands are present but have been heavily impacted by truck storage and contaminated with industrial waste and gravel.

Photograph 4. Looking west from center of the site. Although Delhi Sands are <u>not</u> present in this area, the storage of truck and other industrial projects, as well as the contamination of the underlying soils with industrial waste and gravel that occurs throughout the Project Site are readily apparent.

Photograph 5. Looking north along the eastern boundary of the site. Riverside Avenue can be seen in the right side of the photo.

Photograph 6. Looking west along the northern boundary of the site. Open Delhi Sands occurs along the base of the fence line but have been heavily impacted by storage of truck and mixed with industrial wastes and gravel.