AGUA MANSA DEVELOPMENT PROJECT

Delhi Sands Flower-Loving Fly Habitat Suitability Assessment

Prepared For:

Allard Engineering
16866 Seville Avenue
Fontana, California 92335
Contact: *Bobby Allard*
909.356.1815

Prepared By:

RBF Consulting
A Michael Baker International Company
3210 East Guasti Road, Suite 100
Ontario, California 91761
Contact: *Thomas J. McGill, Ph.D.*
909.974.4907

June 2015

JN: 146722

AGUA MANSA DEVELOPMENT PROJECT

CITY OF BLOOMINGTON, SAN BERNARDINO COUNTY, CALIFORNIA

Delhi Sands Flower-Loving Fly Habitat Suitability Assessment

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.

Travis J. McGill
Biologist
Natural Resources

Thomas J. McGill, Ph.D.
Vice President
Natural Resources

June 2015

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 Agua Mansa Development Project located in the City of Bloomington, San Bernardino County, California (project site or site), just north of the Riverside County boundary. The purpose of this assessment is to characterize existing site conditions and assess the quality of DSF habitat within the boundaries of the project site. The habitat suitability assessment was conducted by RBF biologists Thomas C. Millington and Ashley M. Barton on May 21, 2015.

Portions of the project site have been mapped by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey as being composed of Delhi Sand soils. Since Delhi Sand soils are wind deposited (aeolian) the boundaries established by USDA are not exact and change over time.

Based on the results of the DSF habitat suitability assessment, surface soils present on the project site was determined not to contain clean Delhi Sand soils. As a result, the project site was determined not to have the potential to provide suitable habitat for DSF and it is assumed that DSF is absent from the project site. Further, the project site is surrounded by existing development on three of its sides and no longer has connectivity to areas containing clean Delhi Sands soils or areas subject to Aeolian processes. No further actions or focused surveys are recommended. Development of this property will not impact DSF or impede their recovery as defined by the United States Fish and Wildlife Service (USFWS) DSF Recovery Plan (1997).

Table of Contents

EXHIBITS

APPENDIX

Section 1 Introduction

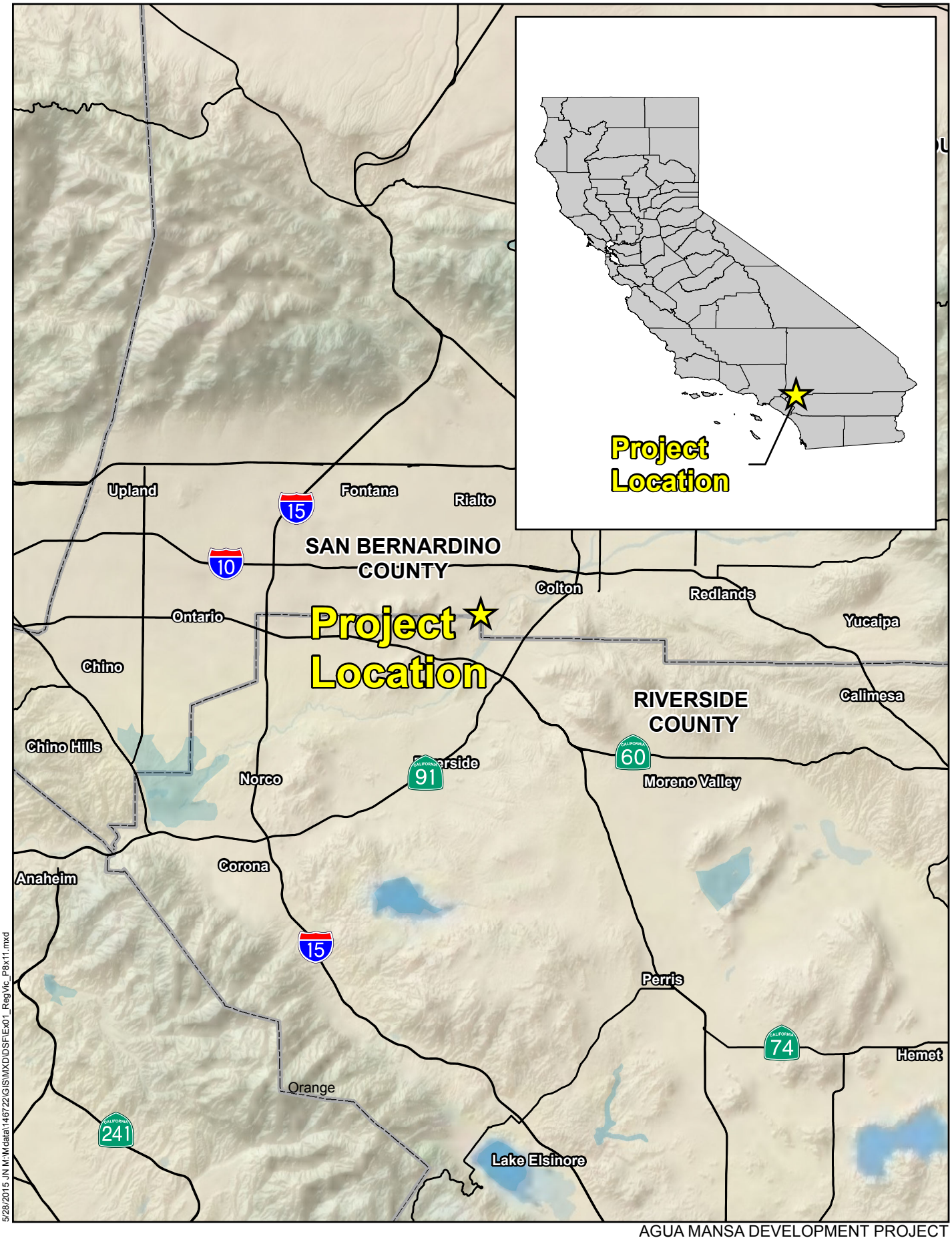
RBF Consulting, a Michael Baker International Company (RBF), prepared this Delhi Sands Flower-Loving Fly (DSF) Habitat Suitability Assessment for the Agua Mansa Development Project located in the City of Bloomington, San Bernardino County, California. RBF biologists Thomas C. Millington and Ashley M. Barton inventoried and evaluated the condition of the habitat on May 21, 2015. This assessment provides an update to a habitat assessment that was prepared in 2007 by Michael Brandman Associates (MBA) and DSF habitat suitability assessment that was prepared by RBF Consulting in 2014. This assessment was conducted to characterize existing site conditions and assess the quality of DSF habitat within the boundaries of the project site, and ensure the conditions of the project site have not changed since the 2007 and 2014 assessment.

1.1 PROJECT LOCATION

The project site is generally located south of Interstate 10 (I-10), west of I-215, east of I-15, and north of State Route 60 in the City of Bloomington, San Bernardino County, California (Exhibit 1, *Regional Vicinity*). The project site is depicted on the Fontana and San Bernardino South quadrangles of the United States Geological Survey's (USGS) 7.5-minute topographic map series in Section 35 of Townships 1 south, Range 3 west (Exhibit 2, *Site Vicinity*). Specifically, the project site is located west of Agua Mansa Road on the northeast corner of the intersection of El Rivino Road with Kiningham Drive (Exhibit 3, *Project Site*).

1.2 PROJECT DESCRIPTION

The proposed project includes a General Plan Amendment (GPA) to change the Agua Mansa Specific Plan Zoning Designation from Single Family Residential to Medium Industrial on 31-acres; a Conditional Use Permit (CUP) to establish a 475,847 square foot warehouse building and a 30,059 square foot warehouse on 31-acres, a Tentative Parcel Map to create 2 parcels on 31 acres within Assessor Parcel Numbers (APNs) 0260-032-11, -12, -13, and -14; 0260-041-01, and -17; 0260-033-01, -02, and -03; 0260-051-06, -07, -08, -09, -10, -11, -12 and -13, within the City of Bloomington, County of San Bernardino, California.



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AGUA MANSA DEVELOPMENT PROJECT
DELHI SANDS FLOWER-LOVING FLY HABITAT SUITABILITY ASSESSMENT

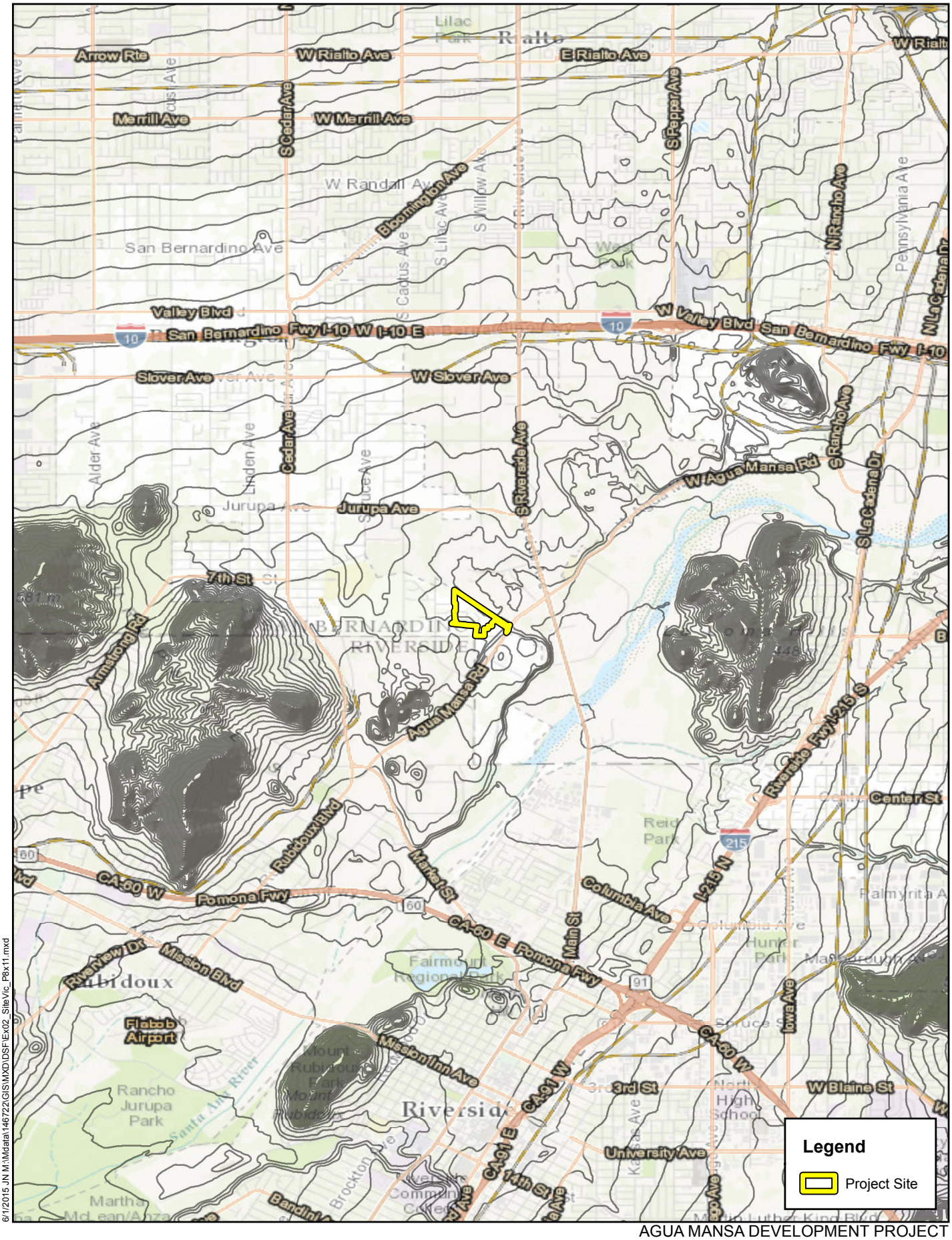
Regional Vicinity

Michael Baker INTERNATIONAL

0 3 6 Miles

Source: ESRI Basemap Imagery, 2014

Exhibit 1



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AGUA MANSA DEVELOPMENT PROJECT
DELHI SANDS FLOWER-LOVING FLY HABITAT SUITABILITY ASSESSMENT

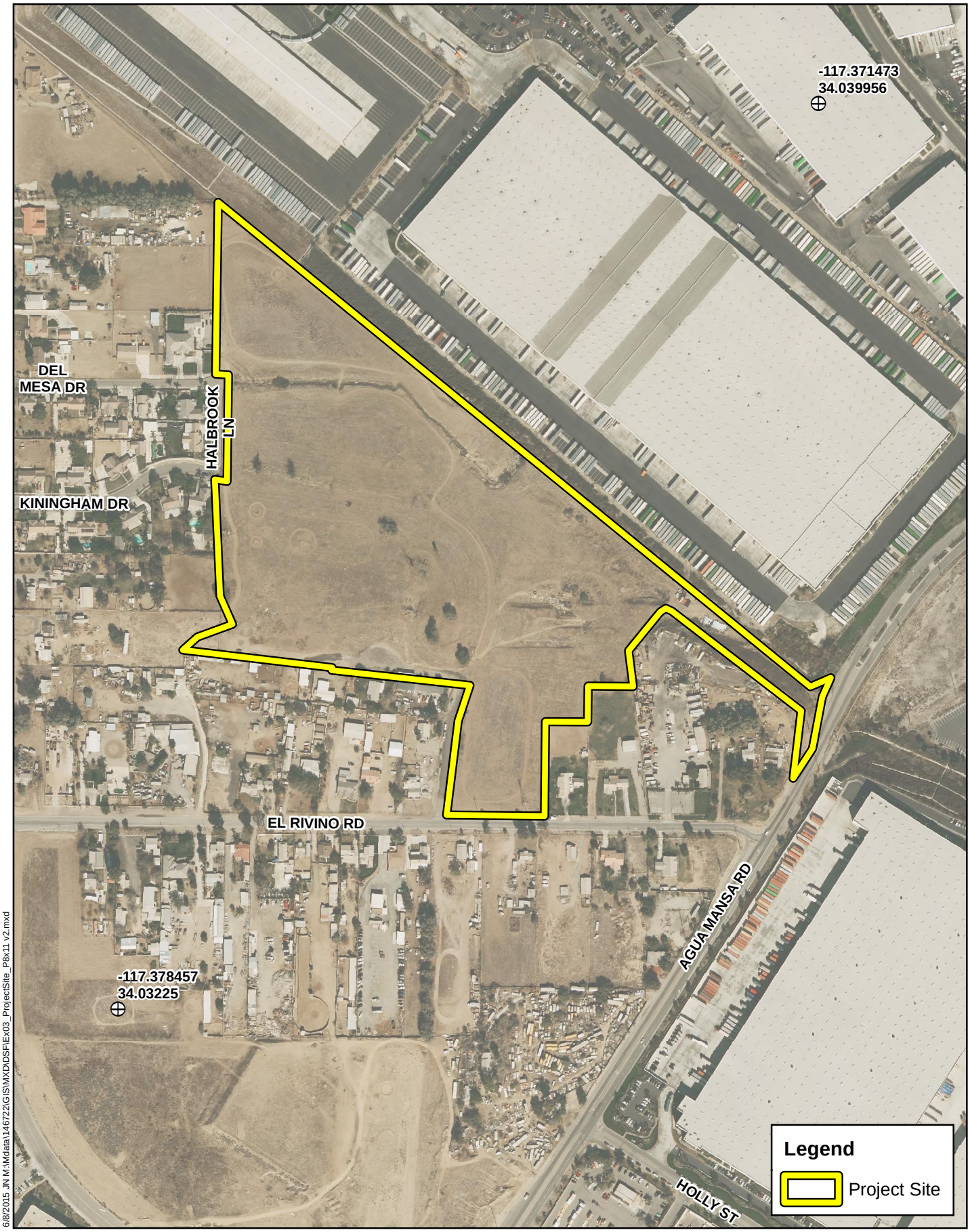
Michael Baker INTERNATIONAL

0 0.5 1 Miles

Source: ESRI USA Topographic Maps

Site Vicinity

Exhibit 2



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AGUA MANSA DEVELOPMENT PROJECT
DELHI SANDS FLOWER-LOVING FLY HABITAT SUITABILITY ASSESSMENT

Michael Baker INTERNATIONAL

0 400 800 Feet

Source: Eagle Aerial 2014

Project Site

Exhibit 3

Section 2 Background

It has been generally acknowledged that DSF occur in Delhi sands, 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 course 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 in 1970 as Delhi Sands no longer have potential to support DSF populations. Conversely, some areas formally mapped as Cieneba soils may now be composed of Delhi Sands and have potential to support DSF. Six DSF experts (Ken Osborne, Greg Ballmen, Rudy Matoni, Karen Cleary-Rose, Alison Anderson and Tom McGill) used this criterion, the relative abundance of clean Delhi Sands verses 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 habitat 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 include only those areas with open, undisturbed Delhi Series soils that have not been permanently altered by residential, commercial, or industrial development, or other human actions. Areas known to contain Delhi Sands and/or to be

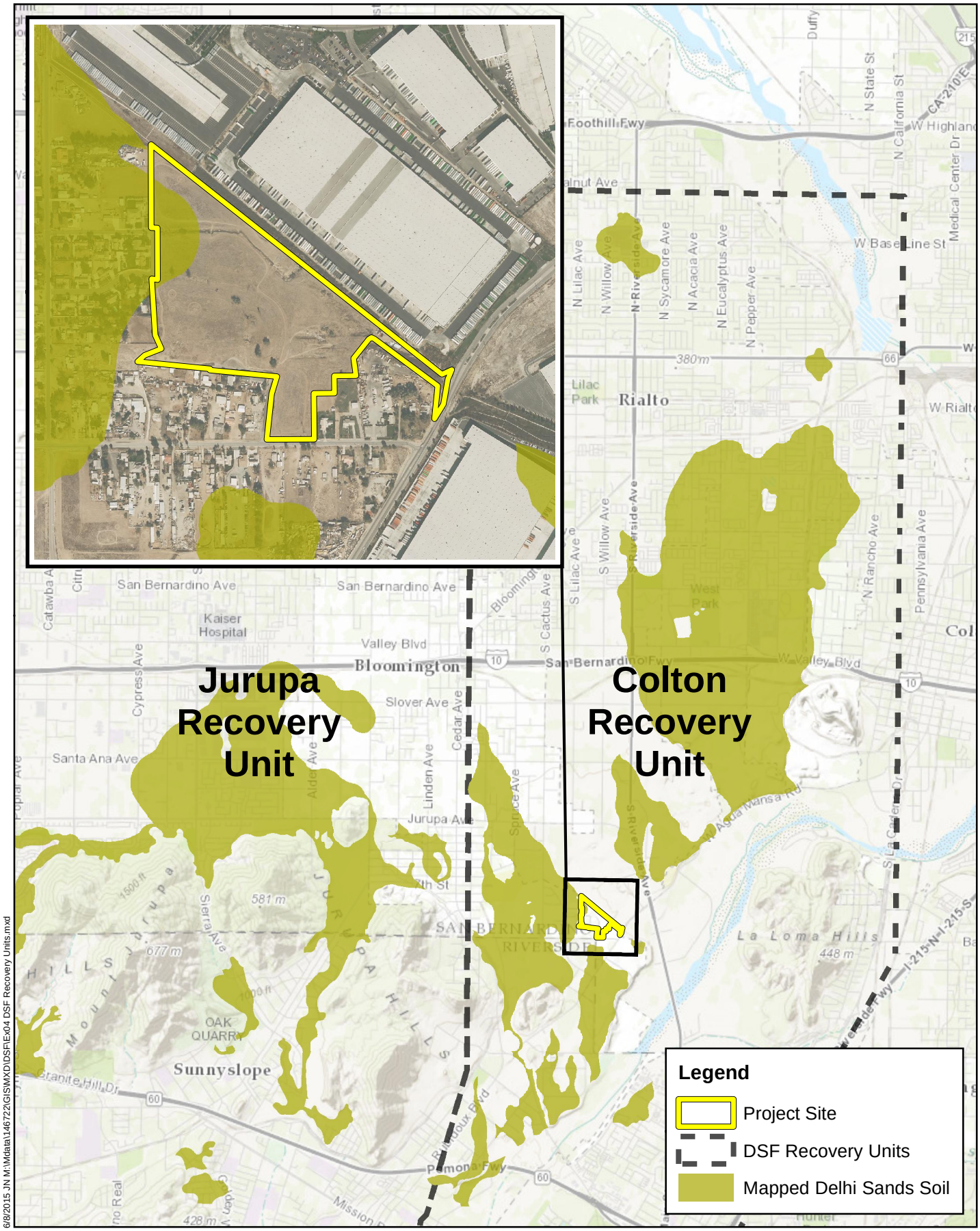
occupied by DSF have been divided by USFWS into three recovery units (Colton, Jurupa, and Ontario Recovery Units (USFWS, 1997)). These recovery units are defined as large geographic areas based on geographic proximity, similarity of habitat, and potential genetic exchange. Within these three recovery units, are areas that have been previously protected by conservation easements:

- Colton: Eight sites have been permanently protected in the Colton recovery unit:

- Jurupa: Approximately 21 ha (52-acres) of DSF habitat have been protected for this population along the Jurupa Hills. Approximately 12 ha (30-aces) are protected under a conservation easement within Riverside County ("I-15/Galena" Biological Opinion; FWS-WRIV-774). An additional 9 ha (22-acres) will be placed under a conservation easement and managed in San Bernardino County as a result of interagency consultation between the USFWS and the U. S. Army Corps of Engineers (Corps) ("Fontana Business Center" Biological Opinion; FWS-SB-1788.9), in accordance with section 7 of the Endangered Species Act.

- Ontario: In 2000, 4 ha (10-acres) of DSF habitat near the intersection of Greystone and Milliken Avenues in the City of Ontario, San Bernardino County, were acquired for conservation and an additional 1.2 ha (3-acres) of contiguous habitat was avoided, but not permanently conserved. At that time, these properties were surrounded by undeveloped land with some characteristics of DSF habitat, and the USFWS anticipated that a larger DSF reserve would be created that could sustain a robust DSF population. However, most of the surrounding property has subsequently been developed for commercial or industrial uses, and it is unlikely that the existing population can be sustained over the long term.

The project site is located within the Colton Recovery Unit, outside the areas protected under the conservation easements (Exhibit 4, *Colton Recovery Unit*). The Colton Recovery Unit includes all areas of the Delhi Sand soils within the cities of Colton and Rialto. In the USFWS five-year review of the DSF Recovery Plan (USFWS, 2008) the USFWS acknowledge that 8 sites had been identified as supporting DSF within the Colton Recovery Unit. These sites have been permanently protected in the Colton Recovery Unit. Within the Colton Recovery unit, the Slover/Pepper population is partially protected through the establishment of a 7.5-acre Colton Transmission Facility Reserve at the eastern terminus of Santa Ana Ave in Colton and 150-acre Conservation Bank. There are about 160-acres of undeveloped DSF habitat contiguous with these conservation areas (USFWS, 2008).



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AGUA MANSA DEVELOPMENT PROJECT
DELHI SANDS FLOWER-LOVING FLY HABITAT SUITABILITY ASSESSMENT

Michael Baker INTERNATIONAL

0 6,000 12,000 Feet

Source: San Bernardino County, Eagle Aerial 2014, ESRI World Topo

DSF Recovery Units

Exhibit 4

Section 3 Methodology

The criteria discussed in detail below were used to rate the relative abundance of clean Delhi Sands verses the amount of Cienba, 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 easier to penetrate and provide good substrate for DSF.

3.1 SOIL

On-site and adjoining soils were researched prior to the field visit using the USDA NRCS Soil Survey for San Bernardino County, California. In addition, a review of the local geological conditions and historical aerial photographs was conducted to assess the ecological changes the project site has undergone. In particular, the USDA NRCS was reviewed to determine the location of mapped Delhi sand soils on or within the immediate vicinity of the project site.

3.2 HABITAT SUITABILITY ASSESSMENT

RBF biologists Thomas C. Millington and Ashley M. Barton surveyed the project site on May 21, 2015. The habitat suitability assessment consisted of a visual and tactile inspection of all areas on the project site that contain Delhi Sand soils. Based on the USDA NRCS Soil Survey, surface soils within the project site are comprised of Delhi fine sand, Greenfield sandy loam, Hanford coarse sandy loam, Ramona sandy loam, Saugus sandy loam, and Tujunga gravelly loam (Exhibit 5, *Soils Map*). Areas identified as containing Delhi Sand soils were evaluated for the quality or purity 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 sands and evidence of soil compaction. *Unsuitable Quality*

2. Delhi Sand soils are present but the soil characteristics include a predominance of alluvial materials (Tujunga Soils and Hilmar loamy sand). *Very Low Quality*

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AGUA MANSA DEVELOPMENT PROJECT
DELHI SANDS FLOWER-LOVING FLY HABITAT SUITABILITY ASSESSMENT

Michael Baker INTERNATIONAL

0 400 800 Feet

Source: Eagle Imagery, 2014. USDA, 2015.

Soils

Exhibit 5

3. Although not clean, sufficient Delhi Sand soils are present to prevent soil compaction. Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality*

4. Abundant clean Delhi Sand soils with little or no 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. *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. *High Quality*

Section 4 Results

4.1 EXISTING CONDITIONS

The project site is located within a heavily developed area in the City of Bloomington, just north of the Riverside County boundary. The project site is relatively flat with no areas of significant topographic relief. On-site surface elevation ranges from approximately 900 to 943 feet above mean sea level and generally slope to the southeast. The project site occurs in an area that has undergone a conversion from natural habitats into residential, industrial, and commercial land uses. The project site is bordered by residential buildings to the west, and east and is bordered by a warehouses to the north.

On-site and surrounding land uses in the immediate vicinity of the project site have heavily disturbed, if not completely eliminated, most of the naturally occurring habitats on and around the project site, reducing the suitability of the habitat to support sensitive plant and wildlife species, in particular DSF. The entire project site consists of undeveloped, vacant land that has been heavily disturbed from previous maintenance activities (i.e., disking, mowing, weed abatement), illegal dumping, and equestrian use. As a result, undisturbed, native plant communities are no longer present within the boundaries of the project site. Site conditions have not changed since the 2007 Habitat Assessment (MBA) and 2014 DSF Suitability Assessment (RBF).

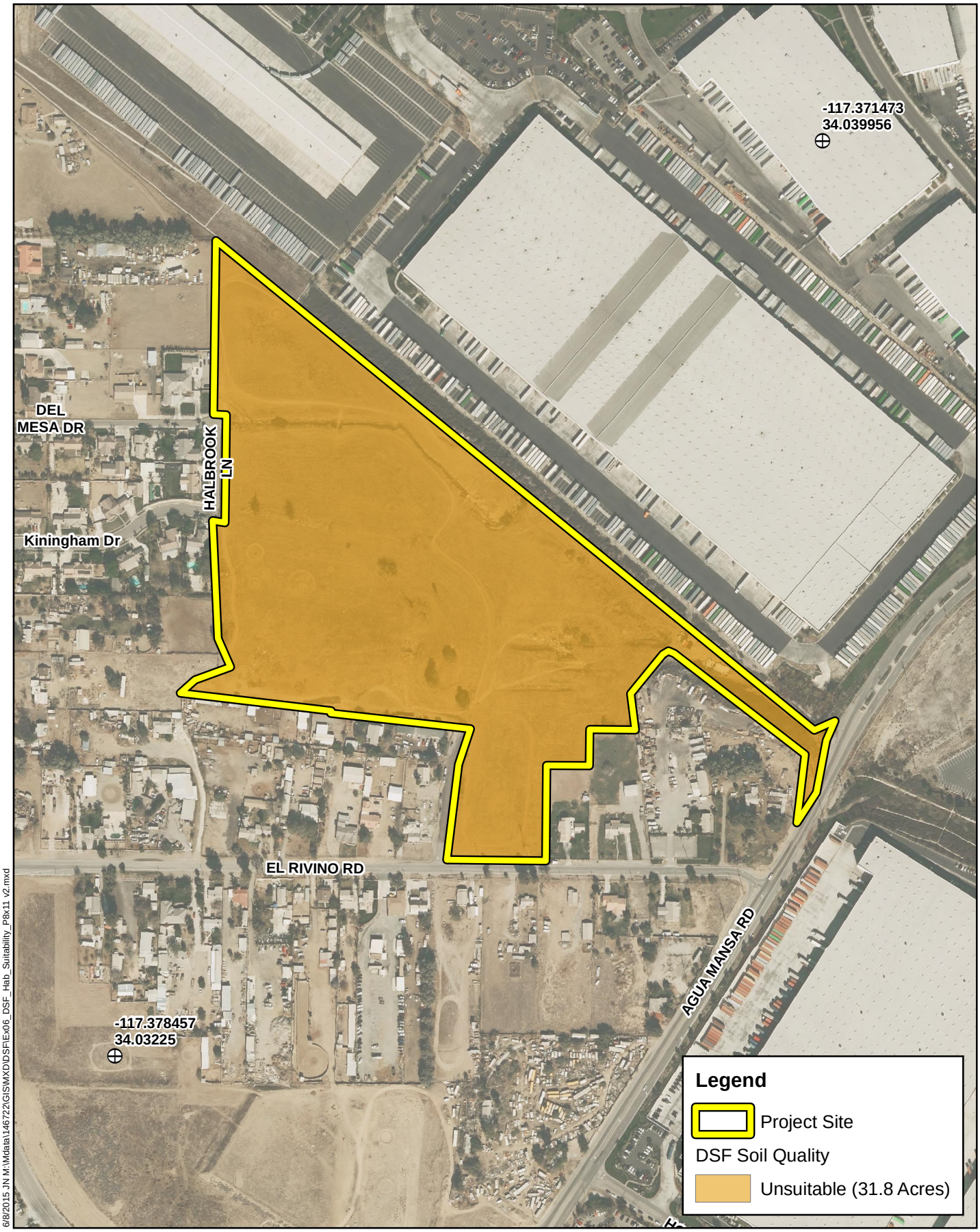
A single disturbed vegetation community was observed on the project site. The vegetation on-site can be characterized as a heavily disturbed non-native grassland plant community that is sparsely vegetated with a variety of non-native and early successional weedy plant species. Plant species observed within the project site include western ragweed (*Ambrosia psilostachya*), fiddleneck (*Amsinckia* sp.), wild oats (*Avena fatua*), red brome (*Bromus madritensis ssp. rubens*), blessed thistle (*Centaurea benedicta*), jimson weed (*Datura wrigtii*), red stemmed filaree (*Erodium cicutarium*), common sunflower (*Helianthus annuus*), short-podded mustard (*Hirschfeldia incana*), horehound (*Marrubium vulgare*), annual yellow sweetclover (*Melilotus indicus*), tree tobacco (*Nicotiana glauca*), and tumbleweed (*Salsola tragus*). Isolated patches of California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*) also occur within the project site. Ornamental vegetation, trailing acacia (*Acacia redolens*), can be found running along the northern border of the project site.

4.2 HABITAT SUITABILITY ASSESSMENT

Per USDA NRCS Soil Survey results, Delhi Sand soils have been mapped on the northwestern portion of the project site (refer to Exhibit 5, *Soils Map*). In addition, the mapped Delhi sand soils extend west of the project site in an area that has consists of residential developments. The soils within the boundaries of the project site have been mechanically disturbed by maintenance activities and surrounding development. These activities have mixed existing surface soils present on the site (e.g., Ramona, Tujunga, Hanford, Saugus, and Grenfied soil series) with Delhi Sand soils that could have provided suitable habitat. As a result, open, undisturbed Delhi sand soils required by DSF do not occur on-site. The undeveloped areas within the project site were rated as unsuitable/very low quality with a habitat quality rating of 1 and 2, respectively, for DSF (Exhibit 6, *DSF Habitat Quality*). There were no areas identified on the project site that provide restorable Delhi Sand soils (a habitat quality rating of 3) or clean Delhi Sand soils (a habitat quality rating of 4/5).

Table 1: Habitat Quality/Suitability Rating

	Suitability Rating		
	Unsuitable (1/2)	Restorable (3)	Suitable (4/5)
Project Site	31.8-acres	-	-
TOTAL	31.8-acres	-	-



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AGUA MANSA DEVELOPMENT PROJECT
DELHI SANDS FLOWER-LOVING FLY HABITAT SUITABILITY ASSESSMENT

Michael Baker INTERNATIONAL

0 400 800 Feet

Source: ESRI Basemap Imgery, 2015

DSF Habitat Suitability

Exhibit 6

Section 5 Conclusion and Recommendations

The undeveloped areas on the project site were determined to contain heavily mixed, compacted soils and the project site was determined not to provide suitable habitat for DSF. The project site does not support the clean Delhi sand soils needed for suitable habitat for DSF and it is assumed that DSF is absent from the project site. No further actions or focused surveys for are recommended. Further, the project site is surrounded by existing development and no longer has connectivity to areas containing clean Delhi Sands soils, areas subject to Aeolian processes, or areas supporting DSF populations.

Section 6 References

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Appendix A Site Photographs

Photograph 1: Facing north across the project site from the southern border along El Rivino Road.

Photograph 2: Looking at the warehouse buildings located on the northern border of the project site.

Photograph 3: Facing west looking at the non-native grassland plant community on the project site.

Photograph 4: Photo of one of the disturbed areas used for equestrian use located on the western border of the site.

Photograph 5: View of the project site facing southeast.

Photograph 6: Example of the illegal dumping that occurs on the project site. Photo was taken in the northeast corner of the site.

Photograph 7: Facing northeast near the eastern border of the site.

Photograph 8: Facing east. Notice the results of the weed abatement activities in the foreground.

Appendix B 2007 Habitat Assessment for a site in Rialto, California

May 18, 2007

Mr. Michael Noriega
Noriega Development, Inc.
12880 Spring Mountain Drive
Rancho Cucamonga, CA 91739

SUBJECT: Habitat Assessment for a site in Rialto, California

Dear Mr. Noriega:

This report contains the findings of Michael Brandman Associates (MBA) habitat assessment for a project site in Rialto, California. The work effort included a site visit to identify any potential sensitive species or habitats that could pose a constraint to development of the parcel. Particular attention was paid to the possible presence of habitat preferred by the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) (DSF). DSF is a federal-listed endangered species- which historically occurred in the region.

Project Site and Vicinity

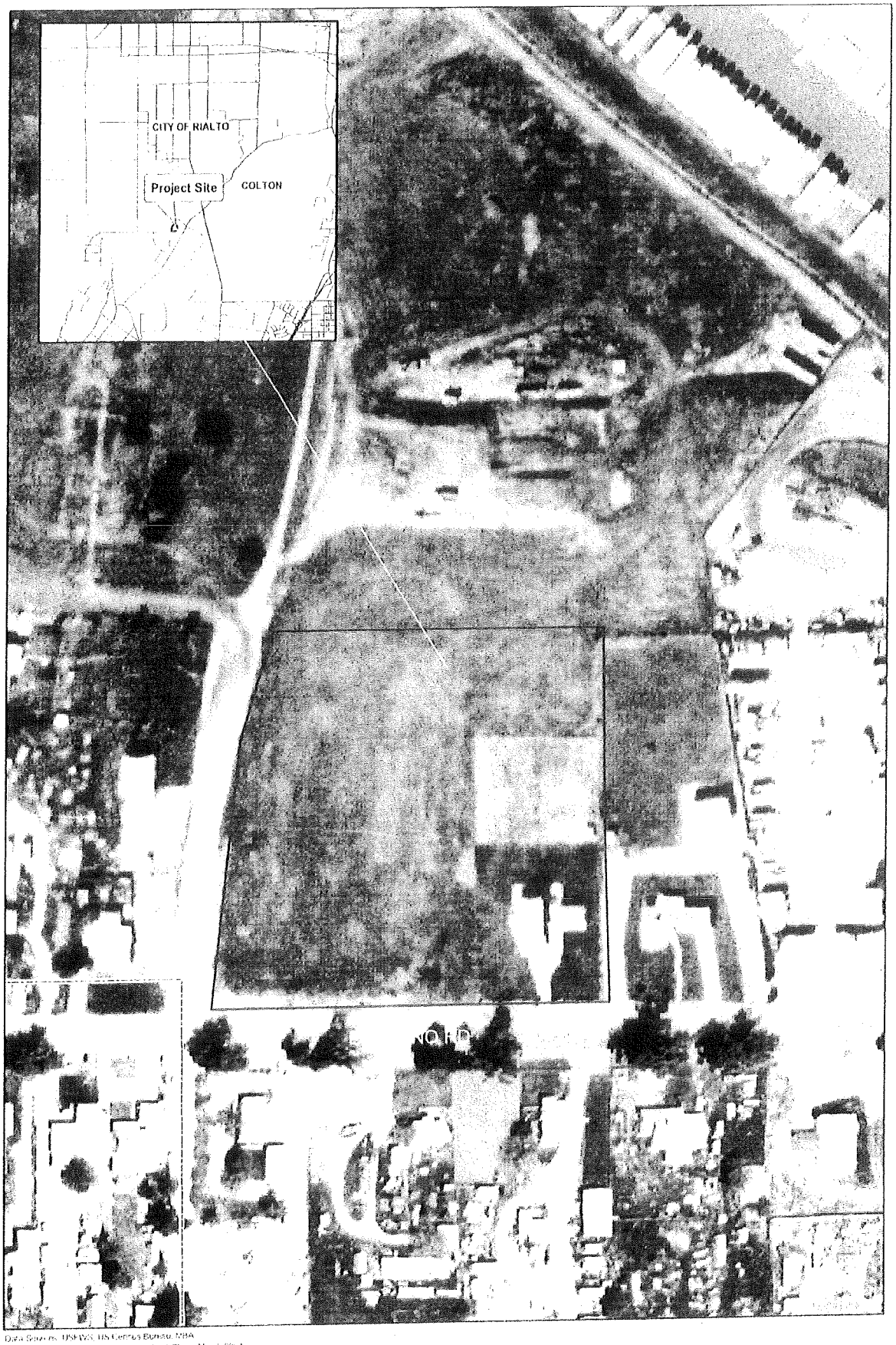
The project site is located in the City of Rialto, and bounded on the west by Agua Mansa Avenue, and development on the east, north and south. Exhibit 1 depicts the project site and vicinity. It is specifically located in Section 23 of Township 1 South, Range 5 West on the San Bernardino South, California U.S. Geological Survey (USGS) Quadrangle Map. Surrounding land uses include commercial and residential development and undeveloped land.

Methodology

The possible presence of DSF onsite was researched through a literature review using the following resources: California Natural Diversity Database (2004), and United States Department of Agriculture Soil Survey of Southwestern San Bernardino County.

Prior to the survey of the project site, Soil Conservation Service soil surveys of the area were reviewed and the USGS San Bernardino South, California topographic quadrangle map was examined to determine where areas of Delhi Sands or other suitable soil types for this species are located.

The site was surveyed on foot by an MBA biologist, Thomas J. McGill, Ph.D., on May 17 at 10 a.m. Weather conditions during the survey included a temperature of 78°Fahrenheit and 25 percent cloud cover.



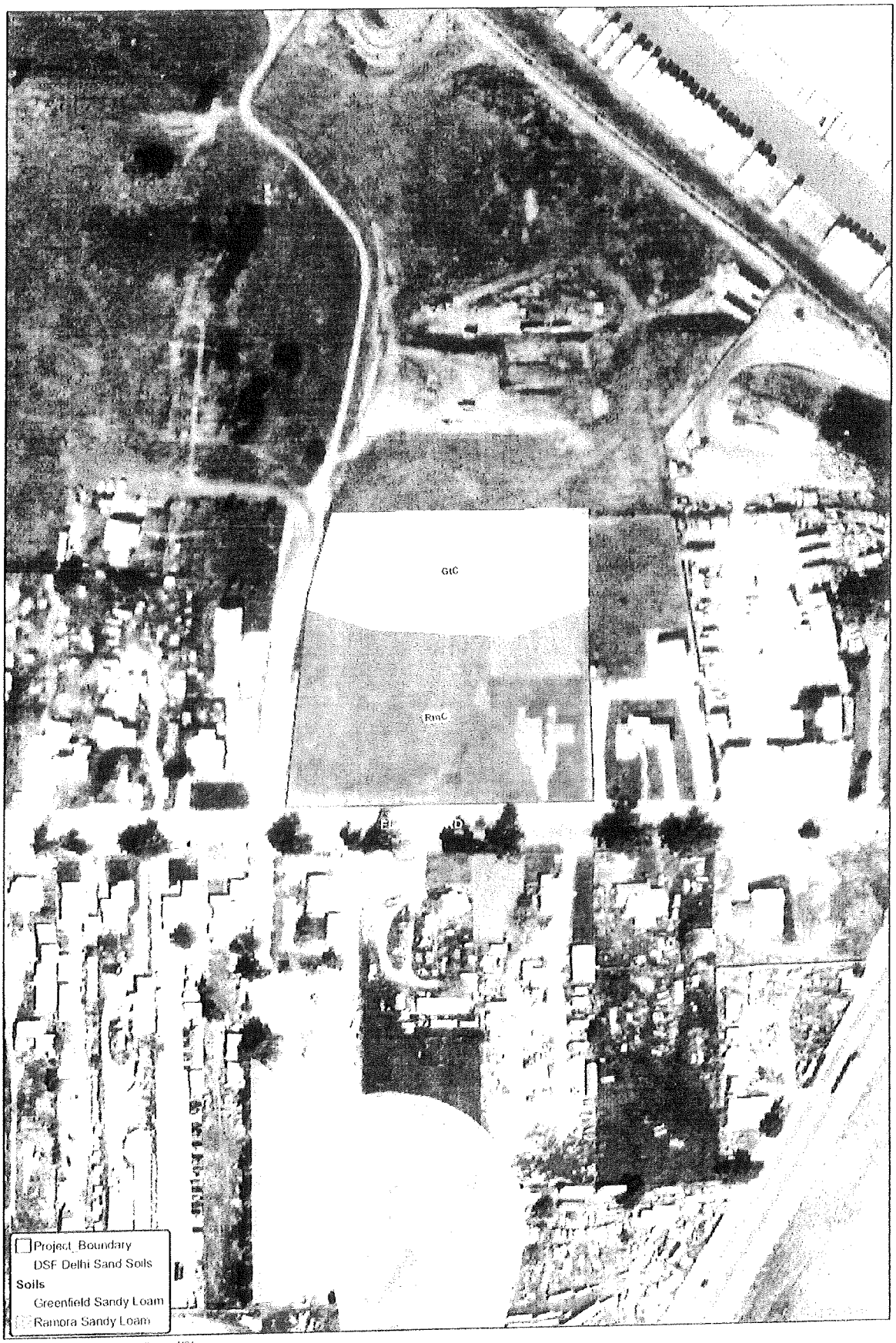
Data Sources: USFWS, US Census Bureau, MBA
Aerial Imagery: Eagle Aerial, 1.5 Foot Pixel, Flown March 2004

Michael Brandman Associates

Project_Boundary

0 50 100 200 Feet

Exhibit-1
SITE MAP
DSF HABITAT ASSESSMENT IN
UNINCORPORATED SAN BERNARDINO COUNTY



Data Sources: USFWS, US Census Bureau, MBA
Aerial Imagery: Eagle Aerial, 1.5 Foot Pixel, Flown March 2004

Michael Brandman Associates

0 62.5 125 250 Feet

Exhibit-2
SOILS MAP

DSF HABITAT ASSESSMENT IN
UNINCORPORATED SAN BERNARDINO COUNTY

Soil conditions at the project site were rated for their potential to support DSF on a scale of 1 to 5, with 5 being the best quality and most suitable habitat in the biologist's judgment.

1. Soils dominated by heavy deposits of alluvial material including coarse sands and gravels with little or no Delhi sands and evidence of soil compaction. *Unsuitable.*

2. Delhi sands are present but the soil characteristics include a predominance of alluvial materials (Tujunga soils). *Very Low Quality.*

3. Although not clean, sufficient Delhi sands are present to prevent soil compaction. Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality.*

4. Abundant clean Delhi sands with little or no alluvial material or Tujunga soils 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. *Moderate Quality*

5. Sand dune habitat with clean Delhi sands. 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. *High Quality*

Biological Setting

The project site consists of a large vacant lot, containing predominately grassy/weedy species[1], including brome (*Bromus* sp.), black mustard (*Brassica nigra*) and western ragweed (*Ambrosia psilostachya*). The site is outside USGS designated distribution of Delhi sands (See Exhibit 2).

The majority of the site is fairly level. Clean Delhi sands soils were not found on the project site. The site was determined to provide unsuitable DSF habitat with a habitat quality rating of 1 (on the scale of 1 to 5 as defined above) of soil characteristics from outside the fence indicated that clear Delhi Sands were present on the property. The site supports native vegetation typically associated with DSF habitat, including telegraph weed and croton.

SUMMARY OF APPLICABLE REGULATIONS

Biological Constraints

Endangered Species

The U.S. Fish and Wildlife Service (USFWS) administers the federal Endangered Species Act (ESA). The ESA was passed in 1973 and has since been amended and re-authorized. The ESA provides a process for listing species as either threatened or endangered, and methods of protecting listed species.

The ESA defines as "endangered" any plant or animal species that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is a species that is likely to become endangered in the foreseeable future.

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[1] In order of abundance.

Section 9 of the ESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. Take can include disturbance to habitats used by a threatened or endangered species during any portion of its life history. The presence of any federally threatened or endangered species in a project area generally imposes severe constraints on development; particularly if development would result in "take" of the species or its habitat.

The project site does not provide suitable habitat for DSF and no further actions are recommended.

Conclusion

MBA's habitat assessment determined that the project site does not contains Delhi sands soils that could provide suitable habitat for the DSF. Some wind deposited Delhi Sands had been found earlier on the surface at the southern edge of the property but it was determined through this habitat assessment that the Delhi Sands did not continue on the site. Development of this property will not impact DSF or impede their recovery as defined by USFWS DSF Recovery Plan (1997).

Please call me at (909) 884-2255 if you have any question concerning this focused habitat assessment report. We look forward to continuing to assist you with work on this or other sites.

Sincerely,

MICHAEL BRANDMAN ASSOCIATES

Thomas J. McGill, Ph.D.
Regional Manager

MSM:nvw:sep
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Attachment: Site Photos

References

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California Department of Fish and Game. 2004. RareFind 2 personal computer program. Data Base Record Search for Information on Threatened, Endangered, Rare, or Otherwise Sensitive Species for the Ontario USGS Topographic Quadrangle. California Department of Fish and Game. State of California Resources Agency. Sacramento, California.

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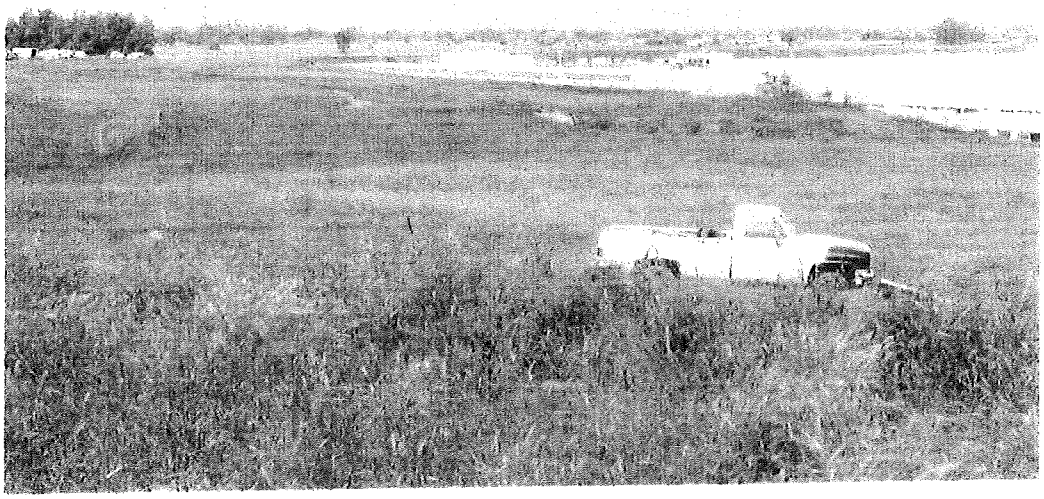
SITE PHOTOS

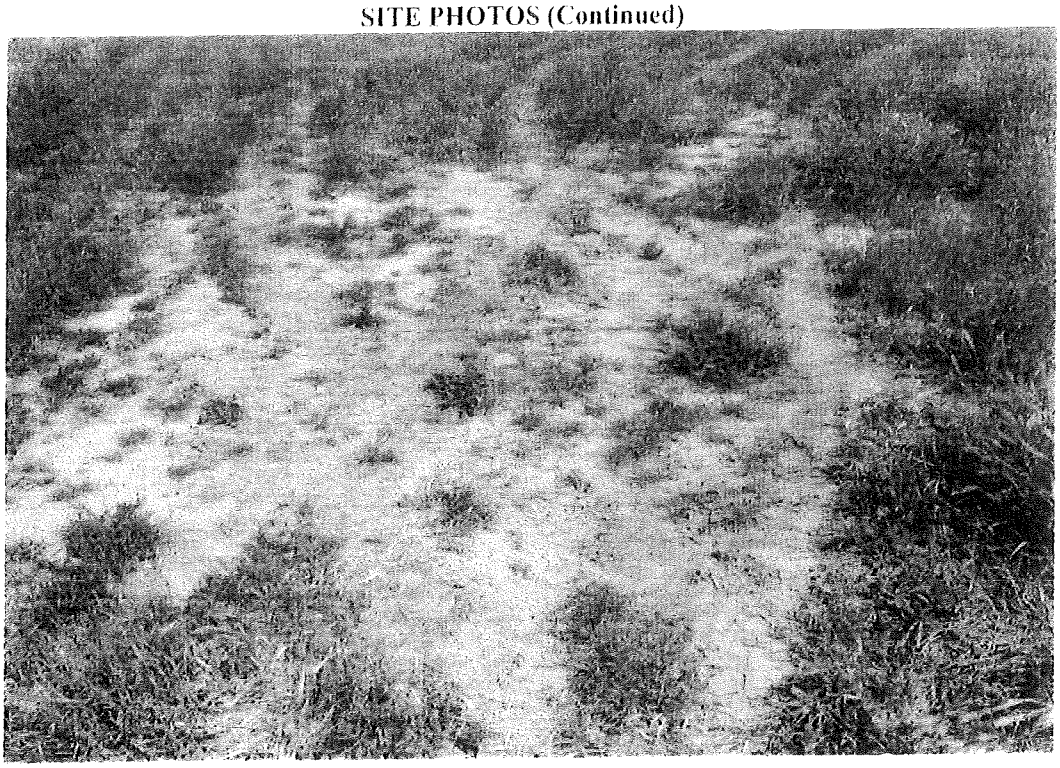
Project Site at the Northeast Corner of El Rivino Rd and Brown Avenue in Rialto, California

Looking South



Looking North

SITE PHOTOS (Continued)



Clay Soils

Clay Soils