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Attn: Mr. Mark Sater  
4300 Edison Avenue,  
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RE: Habitat conditions for Delhi Sands Flower-loving Fly on 2.18 acres (APN 0132-031-03 and -21), Rialto, CA.

To Whom It May Concern:

Mr. Mark Sater (representing Beyond Food Mart) has requested my evaluation of habitat suitability for the federally endangered Delhi Sands Flower-loving Fly (DSF, *Rhaphiomidas terminatus abdominalis*), on two parcels, totaling 2.18 acres, in Rialto, California. This area is indicated on the attached maps, and is located in the southwestern corner of W. Randall Avenue and S. Riverside Avenue. For the purpose of this habitat assessment, I have evaluated site conditions for DSF suitability in terms of site characteristics on the basis of a detailed grading system I have developed in recent years.

**Summary Conclusions:** No portion of the 2.18-acre area (APN 0132-031-03 and -21) is suitable for DSF. Approximately 0.25 acres on the southwestern portion of the area, mapped with Delhi fine sands, are developed to residential use with conditions unsuitable for DSF. The remaining portions of these parcels have Tujunga soils (a soil type unsuitable for DSF) and are furthermore developed to various residential and commercial uses. Lands with such soils and so developed as on the subject area, are not suitable for the DSF.

**Qualifications:** Although I possess USFWS 10(a) permitting to survey for the federally endangered Delhi Sands Flower-loving Fly, such permitting is generally awarded to biologists only on the basis of a biologist's experience with and/or ability to identify adult DSF, such permitting not awarded on the basis of any real understanding of DSF biology, ecology, or habitat requirements. USFWS policy has been to consider any land (within the known range of DSF) to have been mapped with Delhi Sands soils (Woodruff 1980) as subject to formal survey for the DSF. Thus, my additional qualifications in this regard include BS, MS, degrees in entomology, 45 years general entomological experience, over thirty years' experience with, research, and discoveries, in *Rhaphiomidas*, life history, biology, and ecology, such that I am now a leading expert in this narrow field of study.

**Methods:** On **March 21, 2018**, I visited the study area in order to investigate habitat suitability for the DSF. I have reviewed soil maps covering the subject site, prepared by the California Department of Agriculture (Woodruff 1980). Aerial imagery covering the site, dating from 1995 to 2016 (Google Earth, Figure 1) was reviewed in order to gain an understanding of land use regimens in recent years. Photographs were taken of the site along with field notes on vegetation

and soil conditions. I examined the subject site to rate its potential (Osborne et al. 2003) to support DSF, the rating based on the following scale of 1 to 5, with 5 being the best quality and most suitable habitat in my judgment:

1. 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, manure, or organic debris. *Unsuitable*.
2. Delhi sands are present but the soil characteristics include a predominance of exotic soils such as alluvial materials, or predominance of other foreign contamination as gravels, manure, or organic debris. Severe and frequent disturbance (such as a maintenance yard or high use roadbed). *Very Low Quality*.
3. 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 Sands with little or no foreign soils (such as alluvial material) 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 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. Sand associated plant and arthropod species may be abundant and vegetation species composition is often indicative of low disturbance. *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 area on a site, such that very small areas diminish the overall habitat value of a site. Habitat conditions rated from *Very Low Quality* up to *High Quality*, are formally considered as representing *Suitable* conditions for the DSF. Use of this habitat rating system is somewhat subjective and best undertaken by a biologist who has extensive experience with *Rhaphiomidas* species. It must be noted that these ratings do not infer or imply actual occupancy by DSF, only relative potential to harbor the species, and relative conservation value of the land should DSF be found.

**Results:** Department of Agriculture, Soil Conservation Service map (Woodruff 1980) and associated web based resources (<https://casoilresource.lawr.ucdavis.edu/gmap/>) show the site to have Delhi fine sand soils only on the southwestern corner of the study area totaling approximately 0.25 acres (Figure 2). Within the area mapped with Delhi sands, developed residences with surrounding landscaping, door yards, block walls, walkways, driveways and other associated uses (Figures 3 and 4) comprise the entire mapped area of 0.25 acres. The remaining approximately 1.93-acre area is mapped with Tujunga soils (Figure 2) and the gravely, loamy alluvial nature of these soils was confirmed by the field observations in the limited areas (due to developed conditions) where possible. This larger area with Tujunga soils is also developed to residential and

commercial use since at least 1994 (Google Earth). Plant species normally associated with Delhi sands ecosystems do not occur on the site.

**Discussion:** Alluvial soil conditions such as those classified as Tujunga soils, are unsuitable for the DSF, and therefore the majority of the subject site can not support a population of DSF. The small portion of the study area mapped with Delhi sands soils has long ago been developed to residential use with associated constant disturbances and landscaping, and is also therefore not suitable to support DSF. Delhi Sands Flower-loving fly can not be expected to occur on any portion of the 5-acre study area.

**Conclusions and Recommendations:** On the basis of my experience, conditions over the entire subject area are *Unsuitable* for DSF. Lands with undeveloped and undisturbed Delhi sands do not occur within the subject area.

**References:**

Osborne, K. H. 2003. *Delhi Sands Flower-loving fly Habitat Assessment for the Hermosa Cemetery, Colton*. Prepared for Inland Memorial Cremations and Burial. Submitted to the U.S. Fish and Wildlife Service, CA.

Osborne, K. H., G. R. Ballmer, and T. McGill. 2003. *DSF Habitat Assessment for the Proposed Mary Vagle Conservation Area*. Prepared for the City of Fontana. Submitted to the U.S. Fish and Wildlife Service, CA.

University of California, Davis, Agriculture and Natural Resources, California Soil Resource Lab, <https://casoilresource.lawr.ucdavis.edu/gmap/>

U.S. Fish and Wildlife Service. 1996. Delhi Sands Flower-loving Fly Draft Presence/Absence Survey Guidelines. December 30.

Woodruff, G. A. 1980. Soil survey of San Bernardino County, southwestern part, California. U.S. Department of Agriculture, Soil Conservation Service

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Ken H. Osborne', is written over a horizontal line.

Ken H. Osborne



Figure 1. Aerial image showing the subject site (outlined in blue, highlighted yellow).



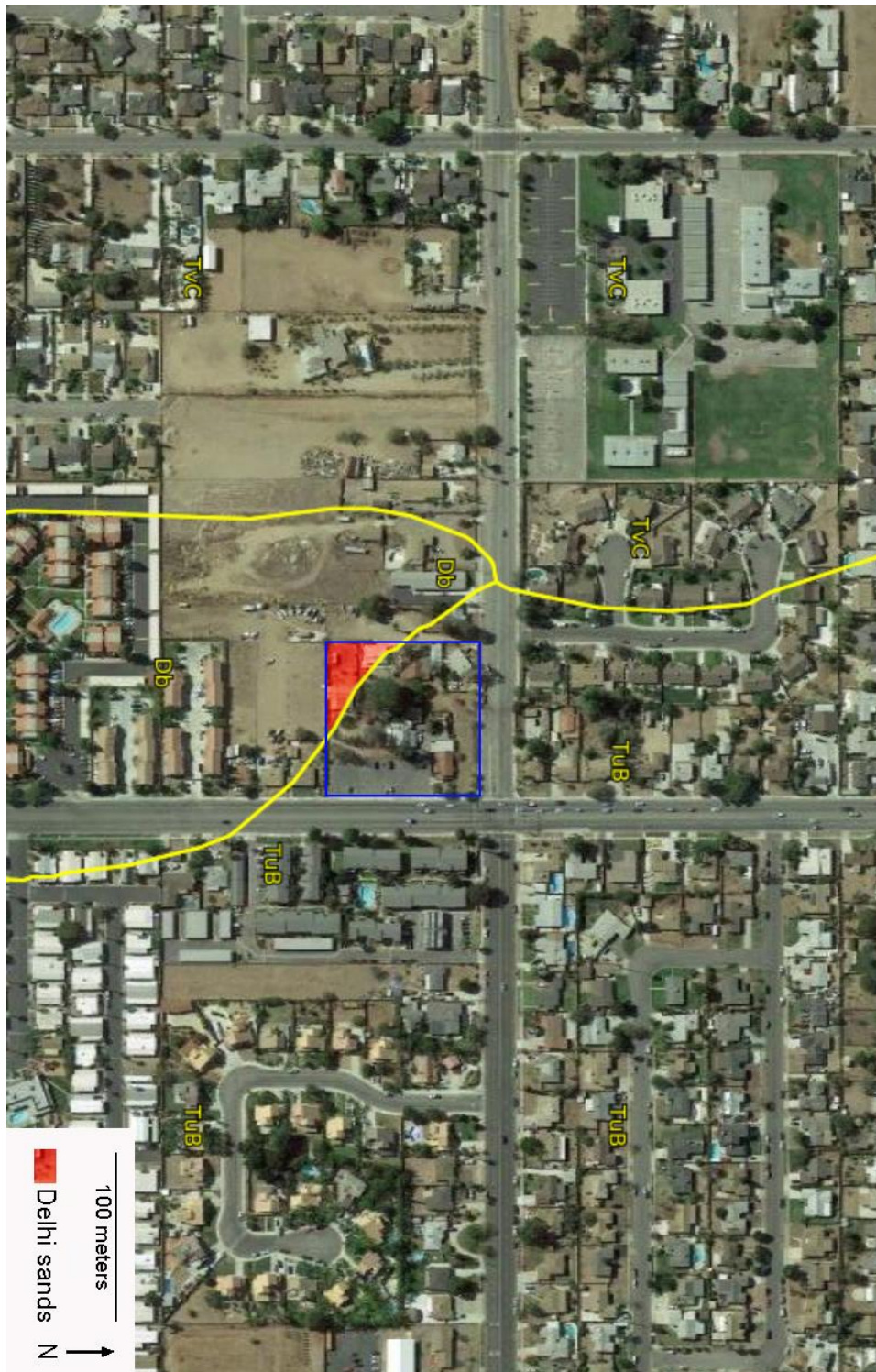


Figure 2. Soil types and habitat conditions on the subject site (outlined in blue): Yellow lines separate soil types: Db = Delhi fine sands; TvC = Tujunga gravely alluvial sands; TuB = Tujunga loamy alluvial soils. Occurrences of mapped Delhi sands on the subject area are shaded red. All habitat on site is *Unsuitable* for DSF due to predominance of Tujunga soils and residential/commercial development.



Figure 3. Photograph of a residential area and associated environment on the northeastern portion of the project area with landscaped residence representing habitat unsuitable for DSF. View looks north off of an on-site parking lot in an area mapped with Tujunga soils.



Figure 4. Photograph of residential development, drive and disturbed habitat on the lots on the southern portion of the project area mapped with Delhi sands. Such landscaped and developed residences represent habitat unsuitable for DSF. View looks west along the site southern boundary.





Figure 5. Photograph of residential development and associated walks and dooryards (view looking southeast from just off site) on the western project site mapped with Delhi sands. Such conditions are unsuitable as DSF habitat.



Figure 6. Photograph of residential development and associated dooryards on the southwestern project (view looking northeast from just off of the site) site mapped with Delhi sands. Such conditions are unsuitable as DSF habitat.



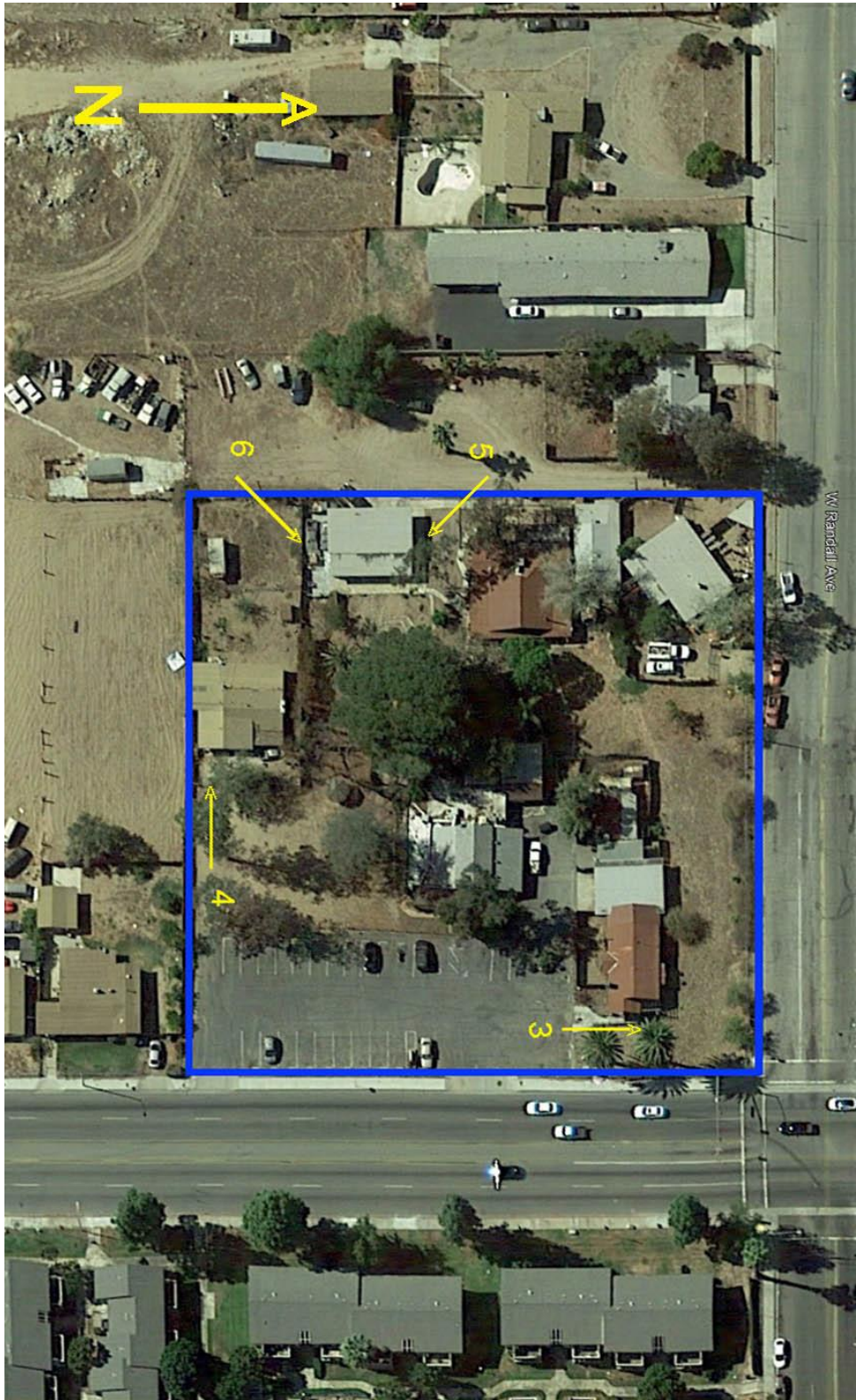


Figure 7. Approximate locations around study site from which photographs were taken (base of arrows). Arrow indicates the direction a photograph was taken. Numbers next to the arrows indicate figure numbers (Figures 3-6).