

**SECOND YEAR FOCUSED SURVEY FOR  
DELHI SANDS  
GIANT FLOWER-LOVING FLY  
(*Rhaphiomidas terminatus abdominalis*)  
ON PORTIONS OF THE RIVERSIDE  
TRANSMISSION RELIABILITY PROJECT,  
RIVERSIDE COUNTY, CALIFORNIA**

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**December 1, 2017**

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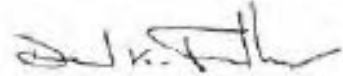
The undersigned certify this report to be a complete and accurate account of the findings and conclusions of a second year, 2017 focused survey for Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) on a series of sites totaling 42.7 acres, for the Riverside Transmission Reliability Project in western Riverside County, California.



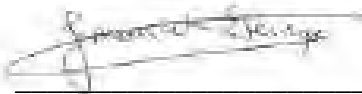
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**December 1, 2017**

## SUMMARY

Kidd Biological, Inc. has requested a focused survey for Delhi Sands Flower-Loving Fly (DSF, *Rhaphiomidas terminatus abdominalis*) to assess the presence or absence of the species on portions of the Riverside Transmission Reliability Project in western Riverside County, California. This report presents the results of a second consecutive year (2017) survey of the project area. Approximately 42.7 acres of the project area (includes buffer area), divided across a series of four discrete survey areas, were identified as having habitat conditions suitable for the DSF. Survey results were negative for DSF in 2016 (Osborne 2016). Year 2017 survey efforts were undertaken on 28 dates, with a total of 25 visits to each survey area, over 82 hours, on approximately 42.7 acres of the project alignment from July 1 through September 18, 2017, with negative results for DSF.

The distribution of Delhi sands soils on undeveloped lands within the project area (including a buffer area) are restricted to a few discontinuous areas extending from just north of the Santa Ana River to immediately north of Cantu-Galleano Ranch Rd. Survey areas were rated ranging from *Low* to *High Quality* for the DSF, and generally consist of agricultural field margins, fallow agricultural fields, and a vacant lot. Habitat conditions through most of the survey areas are rated *Low to Moderate Quality* for DSF. Two other areas mapped with Delhi soils were determined *unsuitable* for DSF (a lot contaminated with stored soils and gravel, and a dairy).

## 1.0 INTRODUCTION

This report presents the methods and results of the second year of a two-year Delhi Sands Flower-Loving Fly (DSF) focused survey and habitat evaluations on Southern California Edison's Riverside Transmission Reliability Project (RTRP) in western Riverside County. This is a new 230-kilovolt transmission line to be constructed in western Riverside County. The study area involves a transect and surrounding buffer area, which extends for approximately 6.5 miles along the Santa Ana River, and an additional 3.5 miles from the Santa Ana River north to Cantu-Galleano Ranch Rd.

The DSF was listed as an endangered species by the U.S. Fish and Wildlife Service (USFWS) on September 23, 1993 (USFWS 1993). Results of the field surveys will provide additional baseline data required to evaluate potential impacts to DSF or supporting suitable habitat for the species as a result of any future development on this project.

All survey areas are displayed in Figures 1 through 8. The distribution of Delhi sands soils on undeveloped lands within the project area (including a buffer area of 500 feet) is restricted to a few discontinuous areas extending from the Santa Ana River, north through Limonite Avenue, and continuing to immediately north of Cantu-Galleano Ranch Rd. (Figures 1 through 8). One small area (0.7 acre) of mapped Delhi sands on the northwestern corner of an undeveloped 2-acre lot, located on the northwestern corner of Lucretia Avenue and 68<sup>th</sup> Street (just north of the Santa Ana River, Figures 1, 8, and 9) has been excluded from focused survey due to unsuitable habitat conditions for DSF. In addition, mapped Delhi sands in agricultural use (Figure 5) and long active dairy operations (Figure 6) have been determined unsuitable for DSF and excluded from survey. The discontinuous, discrete survey areas, which include the proposed project footprint as

well as the buffer area, have been identified as representing suitable habitat for DSF. For reference, each survey area is numbered 1 through 4 (with subparts of area 2) as follows with their approximate acreages: area 1 of 0.9 acre on the north side of Limonite Avenue; area 2a of 9.04 acres on the south side of Landon Dr. and area 2b of 1.5 acres at the southwestern intersection of Landon Dr. and Wineville Ave.; area 3 of 25.84 acres on the northwestern intersection of Wineville Ave., and Cantu-Galleano Ranch Rd.; and survey area 4 of 5.42 acres located northwest of the intersection of Cantu-Galleano Ranch Rd. with Etiwanda Ave. The total acreage of these survey areas is 42.7 acres. The survey areas are located on the Guasti, and Corona North, California USGS 7.5-minute quadrangle maps, Township 2 South, Range 6 West, with survey area 1 in the southeastern corner of Section 19; survey area 2 in eastern Section 18; survey area 3 in southeastern Section 7 and northeastern Section 18; and survey area 4 in eastern Section 8. Figures 1 and 5 show the general vicinity of the survey areas at 50% scale on the Guasti, and Corona North, California USGS 7.5-minute quadrangle maps. Figures 2 and 6 display area 1, and Figures 3 and 7 display survey area 2 (2a and 2b) on the Corona North, California USGS 7.5" quadrangle at 200%. Figures 3 and 7 display survey area 3, and Figures 4 and 8 display survey area 4 on the Guasti, California USGS 7.5" quadrangle at 200%.

## **2.0 NATURAL HISTORY OF THE DELHI SANDS FLOWER-LOVING FLY**

DSF belongs to a genus of flies (*Rhaphiomidas*) commonly known as flower-loving flies (Cazier 1985). There are more than 30 species of these flies, distributed across the southwestern United States and northern Mexico. These flies are huge by the standards set by most flies, with size among the species ranging from approximately 1.5 centimeters up to 3 and even 4 centimeters, and are usually gray, tan, rust, or yellow in color. All species of *Rhaphiomidas* are associated with rather arid, sandy habitats, with most species living on dune systems of inland desert valleys, rivers, deltas, and beach strands. A few species are found in sandy washes, alluvial benches, and remnant glacial moraines. Many species of these flies often hover before flowers in the manner of hummingbirds, using a long, thin, tubular proboscis (mouth-part), with which the flies probe for nectar—hence a traditional name “giant flower-loving flies.” Smaller flies of the family Apioceridae, once considered very closely related to *Rhaphiomidas* were formerly called “flower-loving flies.”

The DSF is only known to occur in association with Delhi sand deposits and presumably occupied the once extensive dune system of the upper Santa Ana River Valley, including portions of what is now the City of Colton, west through portions of the City of Mira Loma, and south to the Santa Ana River. Today, DSF exists on only a few disjunct sites (USFWS 1997) within a radius of about eight miles in southwestern San Bernardino and northwestern Riverside Counties (Colton, Rialto, Fontana, and Mira Loma). More than 95% of known DSF habitat was considered eliminated by development, agriculture, and other land management practices by 1993 (USFWS 1993; USFWS 1996 in Kingsley 1996), however, this proportion is now nearer 98 to 99% due to these ongoing processes. Many of the last remaining fragments of DSF habitat are currently under pressure by land management efforts such as heavy disking, irrigation, manure dumping, and gravel dumping. There is presently an estimated 1,200 acres of habitat that can support this species (USFWS 1997), but this estimate likely includes lands needing extensive habitat restoration.

The adult DSF flight period is typically August and September, when individual adults emerge, reproduce, and die. The adult life span of an individual DSF lasts for a few days and adults do not live beyond the flight period (Kiyani 1995). Adult DSF are highly mobile, agile fliers. Male DSF are frequently seen flying low through habitat, using apparently random, circuitous paths around and between shrubs in search of females. Such “cruising” behavior often covers areas on the scale of 1000 square meters in the time span of a minute. Alternatively, male DSF are often seen flying about an open patch of ground (ca 100 square meters) such as along a dirt path or dune blow-out area. Here, males may repetitively land and rest on an object (such as small dried plants) in the area, and such rests are interrupted by periods of patrolling flight (apparently territorial) about the spot. When alarmed, these insects tend to fly rapidly in more or less a straight line—often covering distances of 100 meters in less than 6 seconds. Adult DSF are known to nectar at flowers of California buckwheat (*Eriogonum fasciculatum*) and California croton (*Croton californica*).

The DSF, like other *Rhaphiomidas* species, appears to have, at minimum, an annual life cycle (because of the annual flight). However, it has been widely believed that the underground larval/pupal stage may persist for additional years, depending upon various environmental factors such as annual rainfall, food availability, and weather conditions during the flight season (many desert *Rhaphiomidas* species do not appear after a drought year and, often, substantial flights occur only sporadically over the years). Though it has long been known that *Rhaphiomidas* larvae develop underground, until recently the specific biology (larval biology, habits, and food requirements) were not known for any *Rhaphiomidas* species. In 2003, an extensive excavation in known habitat of the San Joaquin Valley giant flower-loving fly (*Rhaphiomidas trochilus*) (Osborne and Ballmer 2014) recovered very large and strange looking fly larvae, inferred as *Rhaphiomidas* and later confirmed to be those of *Rhaphiomidas trochilus* based on DNA analysis. The biology of *R. trochilus* is likely informative of *Rhaphiomidas* species in general and DSF in particular. Based on observations of captive *R. trochilus* larvae (Osborne and Ballmer 2014) it is reasonable to conclude that they are mobile opportunistic predators of soft-bodied, sand-inhabiting insects. Larvae from Sand Ridge, Kern County, CA, were maintained in captivity for several months, during which they burrowed actively through sand maintained with slight moisture content (similar to the damp sand where they were found). They fed on larvae of a scarab beetle (Scarabaeidae) and an unidentified bee fly (Diptera: Bombyliidae), which were also recovered from Sand Ridge, and larvae of paper wasps (*Polistes* sp.), which were removed from their nests and buried in the sand. Captive larvae grew and molted after feeding; but, when not fed for extended periods of time, they molted again, losing weight and size in the process. Some larvae were observed to repeat the growth and “shrinkage” cycle multiple times. One larva survived about 17 months in captivity it was captured nine months after the most recent flight season and was at least two years old at time of death. This larva molted four times while undergoing five cycles of growth and shrinkage driven by variable food availability. Its final dry weight was slightly smaller than the typical dry weight of an adult male *R. trochilus*. The ability of *R. trochilus* larvae to molt down during times of scarce food resources could allow an extended and indeterminate larval growth period, but with maturation and appearance of adults always during summer months. This may also explain the common observations that populations of various *Rhaphiomidas* species apparently exhibit little or no adult emergence in some years (especially years of below normal precipitation).

The brief adult life span and active, random search mate-locating behavior of DSF males (typical of all *Rhaphiomidas* species) indicates that relatively high population density and/or nearly synchronous adult emergence are likely crucial to survival of populations. Protracted *Rhaphiomidas* larval biology and staggered (across years) adult emergence must enhance population momentum and cross generational gene flow, and the requirement of abundant and diverse insect prey on which larvae develop—all explain why DSF populations appear as long-term entities (persisting for decades) associated with ecologically intact dune habitats. This also explains why some populations, even though small numbers of adults emerge during flight seasons, eventually fail. These doomed “ghost populations” dwindle down to extinction after overall ecological health of habitat is compromised by various forms of ecological diminishment—ever increasing portions of habitat developed, agricultural use, incessant recreational vehicle use, annual disking of the vegetation community and upper soil column, encroachment of exotic plants, etc.

## 2.1 DSF Habitat Characteristics

DSF is typically found in areas of unconsolidated sandy soils (Delhi series) supporting an open community of native and exotic plant species. Dominant plants are typically California buckwheat, California croton, telegraph weed (*Heterotheca grandiflora*), and deerweed (*Acmespon glaber*), but many exotic species often dominate on DSF habitat as well. DSF have been found in habitats that do not support these dominant plant species, and plant species composition may not be directly relevant to larval development (due to likely predatory or parasitic habit of DSF larvae). Adult DSF are anecdotally believed to nectar at flowers of California buckwheat and California croton, though such a habitat is rare at best and not yet documented. Many other plant species are common, including Thurber’s eriogonum (*Eriogonum thurberi*), autumn vinegar weed (*Lessingia glandulifera*), and sapphire eriastrum (*Eriastrum sapphirinum*). Non-native plant species also occur in DSF habitat (and incidentally, virtually everywhere). DSF habitat also supports other associated insects such as flies and wasps considered as indicator species—*Apiocera convergens*, *Apiocera chrysolasia*, *Ligyra gozophylax*, *Campsomeris tolteca*, *Trielis alcione*, and *Nemomydas pantherinus*. Over 350 insect species have been found on one DSF site, and DSF habitat is typically marked by high abundance and diversity of predatory and parasitic insect groups, including many highly specialized families of flies, wasps, bees, beetles, and antlions. The Delhi Sands community is one of California's unique natural communities containing an array of native plants and animals, some of which are found nowhere else. One plant species, Pringle's monardella, (*Monardella pringlei*), is already presumed extinct, as no living individuals have been observed in many years. Several species of insects and some vertebrates, which inhabit the Delhi Sands dunes system, are as endangered as the DSF, but no one has yet petitioned to have them officially declared Endangered. These include the convergent flower-loving fly *Apiocera convergens*, a newly discovered species of Jerusalem cricket (*Stenopelmatus* sp.), a new species of camel cricket (*Ceuthophilus* sp.) and an endemic subspecies of butterfly *Apodemia mormo nigrescens* (Emmel and Emmel 1998). The other apiocerid fly (*Apiocera chrysolasia*), although known from approximately six general localities, is only common within the Delhi sands.



## 3.0 METHODS

### 3.1 DSF Survey Guidelines

Interim General Survey Guidelines for the DSF have been suggested by the USFWS (1996). By following these guidelines, DSF presence or absence survey results may be deemed acceptable to the USFWS (rejection of survey results may result where the guidelines are not followed). The guidelines indicate that focused DSF surveys should be conducted wherever Delhi sands are present within the presumed range of DSF, twice weekly (two days per week) during the annual flight period (usually from July 1 through September 20). Recent early season DSF discoveries led the USFWS to recommend a survey season from July 15 through September 20 for 2003 and a survey season from July 1 through September 20 for 2004. Weather conditions must be suitable for DSF activity at the times survey work is pursued. The DSF is generally active when daytime temperatures exceed 80 degrees Fahrenheit ( $^{\circ}F$ ), but may fly with slightly cooler temperatures in bright sunlight.

### 3.2 Habitat Assessment Methods

Evaluation of habitat potential for the DSF involves a two-step or two-tiered process: Since DSF is restricted to aeolian Delhi Sands soils, characterized as Delhi Sands (Ballmer 1989; USFWS 1996), soil survey maps (Knecht 1971) are first consulted (for areas within Riverside County) in order to determine those undeveloped portions of a project area that fall within these mapped Delhi sands. The soils of particular interest are Delhi fine sand (DaD2 of Knecht 1971) and Delhi loamy fine sand (DbA of Knecht 1971). Areas clearly outside of Delhi sands soils are unsuitable for DSF. Secondly, those portions of project areas that do fall within mapped Delhi sands and areas immediately adjacent to these mapped soils (boundaries between soil types are sometimes blended or blurred on lands that have long been subject to disking) and are ground proofed and investigated for site conditions and suitability for DSF. Habitat evaluations for northern portions of this project were undertaken previously (2010), and reports on DSF surveys for portions of this project (Osborne 2010, 2011) were reviewed as part of this evaluation. On June 8, 2016, Osborne examined those portions of the project mapped with Delhi sands in order to re-evaluate and rate potential to support DSF. Photographs were taken of the survey areas. Habitat suitability for DSF was evaluated using indicators of potential DSF habitat, including presence and abundance of loose, unconsolidated Delhi sands with low organic contamination; presence of sand-associated insects; degree of habitat disturbance indicated by plant species composition and disposition of soil surface; and presence and abundance of native sand-associated plant species often associated with Delhi sands and indicative of relative disturbance regimens (conditions with lesser disturbance being of higher quality for DSF) such as *Croton californicus*, *Heterotheca grandiflora*, *Eriogonum thurberi*, *Eriogonum fasciculatum*, and *Verbesina encelioides*.

In the course of previous work (Osborne 2003; Osborne et al. 2003), Osborne developed a means of rating habitat on-site for potential to support DSF, rating areas within any survey area based on a scale of 1 to 5, with 5 being the best quality and most suitable habitat based on the following scheme:

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. *High Quality*

It should be noted that habitat qualities often vary spatially within a given site so that conditions 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. Use of this habitat rating system is somewhat subjective and best undertaken by a biologist who has extensive experience with *Rhaphiomidas* species. While investigating the subject site, Osborne analyzed overall habitat conditions relevant to DSF potential. This rating scheme was originally developed to contribute an objective means of determining mitigation rates for sites found to support DSF; however, these ratings are helpful toward informing generally habitat conditions.

### **3.3 Survey Methods**

Multiple survey areas across the project, comprising a total of 42.7 acres, were identified as having habitat conditions suitable for the DSF (Table 1). Each survey area was surveyed a total of 25 times, with the study area being visited on a total of 28 days throughout the season. Survey effort at each area was determined by acreage (Table 1) in keeping with recommended USFWS Interim General Survey Guidelines (USFWS 1996).

**Table 1. Survey areas, their acreages, and calculated minimal survey time (effort) on a per visit (two visits per week) basis and for the season total.**

Survey area	Acres	Hours/day	Season hours
<b>1</b>	0.9	0.07	1.58
<b>2a</b>	9.04	0.72	15.91
<b>2b</b>	1.5	0.12	2.64
<b>3</b>	25.84	2.07	45.48
<b>4</b>	5.42	0.43	9.54
<b>Totals</b>	<b>42.7</b>	<b>3.42</b>	<b>75.15</b>

Survey efforts were undertaken from July 1 through September 18, 2017, with the overall minimal survey effort totaling at least 75.15 hours (not including one off-schedule survey effort). On August 4, at the end of the fifth week of the survey season, Osborne undertook the survey a day earlier than the required protocol; therefore, an additional survey was conducted resulting in a survey effort that was somewhat more rigorous than required. The actual times of survey efforts applied to each survey area on a daily basis are recorded on the field data sheets presented in Appendix C.

Some undeveloped portions of the project mapped (Knecht 1971) with Delhi sands were not surveyed due to habitat unsuitability for the DSF (vacant lot with contaminated soils, active agricultural areas and dairies).

Focused DSF surveys were conducted under Federal U. S. Fish and Wildlife Permits by Kendall H. Osborne, Permit # TE-837760-10, Dr. Jeremiah George (an authorized investigator under Osborne's permit), Rick Rogers # TE-844465-1, David K. Faulkner # TE-838743-6, and Eric S. Renfro # TE-142436-2, a team with a combined 243 years of entomological experience. Following the USFWS Interim General Survey Guidelines, all portions of the survey area with suitable habitat were surveyed at least twice a week, generally between the hours of 1000 and 1400 (Table 2). The survey protocol, as set forth in the Interim General Guidelines for the Delhi Sands flower-loving fly survey, is designed to maximize the validity of a presence/absence determination.

Osborne photographed the study areas from several perspectives to document existing conditions. Notes were taken on vegetative cover and plant species composition, abundance and diversity and species composition of insects and other animals, soil types, degree and nature of disturbance, surface cover, organic content, compaction, current land management practices, existing development and the condition of surrounding vicinity and proximity of other DSF populations.

**Table 2. Dates, biologist, times and conditions for 2017 DSF survey work.  
Location indicates distinct survey areas.**

<b>Date</b>	<b>Biologist</b>	<b>Survey areas</b>	<b>Time</b>	<b>Weather conditions</b>
7/1/2017	J. George	1, 2A, 2B, 3, 4	1000-1400	0-95% clouds, patchy, overcast, clear, winds 0-3 mph, 67-84°F.
7/5/2017	D. Faulkner	1, 2A, 2B, 3, 4	1000-1400	0-70% haze, clear/patchy, 1-5 mph, 84-99°F.
7/9/2017	E. Renfro	1, 2A, 2B, 3, 4	1000-1400	5-50% clouds, overcast/patchy, 1-2 mph, 91-101°F.
7/12/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	clear, winds 1-6 mph, 88-98°F.
7/17/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	clear, winds 1-8 mph, 87-99°F.
7/21/2017	J. George	1, 2A, 2B, 3, 4	1000-1400	clear, winds 2-8 mph, 81-95°F.
7/24/2017	D. Faulkner	1, 2A, 2B, 3, 4	1000-1400	95-99% patchy clouds to overcast/drizzle/shower, winds 0-2 mph, 77-79°F.
7/25/2017	E. Renfro	2B, 4	1000-1037	10-15% clouds, patchy, winds 1-2 mph, 83-85°F.
7/28/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	clear, winds 1-5 mph, 88-95°F.
7/30/2017	D. Faulkner	1, 2A, 2B, 3, 4	1000-1400	haze/clear, winds 0-4 mph, 80-92°F.
8/2/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	90% clouds, patchy, winds 0-2 mph, 86-95°F.
*8/4/2017	K. Osborne	1, 2A, 2B, 3, 4	1000-1400	clear, winds 1-8 mph, 89-96°F.
8/5/2017	K. Osborne	1, 2A, 2B, 3, 4	1135-1340	clear, winds 0-5 mph, 91-96°F.
8/6/2017	K. Osborne	3	1125-1315	clear, winds 0-5 mph, 83-90°F.
8/9/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	clear, winds 1-3 mph, 89-95°F.
8/13/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1250	clear, winds 0-4 mph, 90-94°F.
8/17/2017	J. George	1, 2A, 2B, 3, 4	1015-1400	0-40% clouds, overcast, clear, winds 2-7 mph, 75-90°F.
8/20/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	clear, winds 0-3 mph, 85-95°F.
8/23/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	0-10% clouds, patchy, clear, winds 1-6 mph, 80-89°F.
8/27/2017	D. Faulkner	1, 2A, 2B, 3, 4	1000-1400	0-10% clouds, haze, patchy, clear, winds 0-6 mph, 80-102°F.
8/30/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	clear, winds 0-5 mph, 91-106°F.
9/2/2017	K. Osborne	1, 2A, 2B, 3, (4 part)	1005-1400	1-10% clouds, clear, winds 0-7 mph, 99-109°F.
9/3/2017	K. Osborne	4 part	1245-1250	0-50% clouds, clear, patchy, winds 2-5 mph, 100°F.
9/5/2017	R. Rogers	1, 2A, 2B, 3, 4	1000-1356	5 to 40% patchy clouds, winds 0-10 mph, 93-98°F.
9/9/2017	J. George	1, 2A, 2B, 3, 4	1000-1400	50-65% patchy clouds to overcast, winds 4-12 mph, 73-90°F.
9/11/2017	D. Faulkner	1, 2A, 2B, 3, 4	1000-1400	50-80% patchy clouds, winds 0-4 mph, 80-91°F.
9/16/2017	D. Faulkner	1, 2A, 2B, 3, 4	1000-1400	40-100% patchy clouds to overcast, winds 0-4 mph, 72-79°F.
9/18/2017	K. Osborne	1, 2A, 2B, 3, 4	1000-1400	0-1% clouds, clear, winds 0-4 mph, 74-81°F.

\* Additional survey effort due to mistake in scheduling

## 4.0 RESULTS

### 4.1 Habitat Assessment Results

The distribution of Delhi sands soils on undeveloped lands within the project area (including a buffer area) is restricted to a few discontinuous areas extending from the north side of the Santa Ana River to immediately north of Cantu-Galleano Ranch Rd. (Figures 1 through 3). Much of the project extends through extensive areas of undeveloped lands along the Santa Ana River. Though these riverine soils are often sandy, they are alluvial sands, often flooded and with an associated high water table supporting riparian vegetation and representing conditions unsuitable for DSF.

Survey area 1 is located north of and adjacent to Limonite Avenue, just east of Interstate 15 (Figures 2 and 6). The majority of this undeveloped site (northerly portions) is situated in an active agricultural field, in previous use for decades (at least since 1994; Google Earth). These agricultural portions of the site are unsuitable for DSF. A small southern edge of this site exhibits abundant Delhi sands, sand-associated insects (*Bembix* are abundant) and plants (*Verbesina*) and is sufficiently undisturbed so as to constitute suitable DSF habitat of moderate to low quality. Most western portions of this survey area are mapped with soils other than Delhi sands. However, due to a history of excavations (an underground pipeline) and agricultural tilling, the soils have been mixed with the Delhi sands present on eastern portions of the survey area, and so these western portions of the area are liberally included as potential habitat for DSF.

Survey area 2 consists of two discontinuous patches of sand deposits, fallow in recent years after a long history in agricultural use, located along the south side of Landon Dr. (Figures 3 and 7). Small patches of soils mapped as with Delhi sands (Knecht 1971) constitute the portions representing DSF habitat (2a and 2b) mapped by Knecht. Current conditions through these areas range from low to high quality DSF habitat.

Survey area 3 on the northwestern intersection of Wineville Ave. and Cantu-Galleano Ranch Rd. also represents a site fallow in recent years after a long history in agricultural use (Figures 3 and 7). Though portions appear to be disked on an annual basis, a small fragment of remnant dune along the roadside remains essentially unchanged since the previous DSF surveys undertaken in 2010 and 2011 (Osborne 2011). Conditions on the survey area rate as moderate quality DSF habitat.

Survey area 4 on the west side of Etiwanda Avenue is an open field without any recent agricultural use, mapped (Knecht 1971) with Tujunga soils (Figures 4 and 8). However, this area is part of a larger field with Delhi sands on its southern portions, and due to a history of disking on the area, soils are mixed. Some sand associated plant species are present on the area. The area is rated as low to moderate quality DSF habitat, and included for focused survey in spite of its being mapped as alluvial Tujunga soils.

Although habitat quality for DSF ranges from low to high quality on these sites, generally habitat conditions are of low quality, and where the sites are surrounded by similar low quality habitats or developed conditions, the probability of DSF occurrence on the survey areas is very low. A

number of surveys for DSF have been conducted on lands nearby the survey areas over recent years – all with negative results for DSF (Osborne 2017, 2017a, 2017b, 2017c, 2017d). To our knowledge, DSF has not been observed at any location within five kilometers of the subject survey areas for more than a decade.

Table 3 provides the rating of habitats for potential to support DSF, along with brief explanation of conditions driving the rating.

**Table 3: Rating of DSF habitat quality on Project areas**

<b>Survey Area</b>	<b>Habitat for DSF</b>	<b>Explanation</b>
1	Low Quality	A small area with relatively undisturbed Delhi sands with ruderal vegetation dominated by annual grasses, <i>Verbesina</i> , <i>Helianthus</i> , and <i>Amaranthus</i> . Very small area in extent and long surrounded by unsuitable agricultural conditions, which renders the area as low quality habitat. This area includes other soils mixed with Delhi sands.
2a	Low to High Quality	History of disking, vegetation of exotic annual grasslands. Sands appear overly fine and semi alkaline.
2b	Low to Moderate Quality	History of disking, vegetation of exotic annual grasslands and forblands with <i>Verbesina</i> in some areas.
3	Moderate Quality	History of disking, vegetation of exotic annual forbs ( <i>Salsola</i> , <i>Kochia</i> ) with <i>Verbesina</i> prominent on a limited sandy portion. Portions of relictual dune.
4	Low to Moderate Quality	Large field with extensive sandy soils mapped with Tujunga soils, but disking has mixed soils with Delhi sands. Sand associated plants.
Dairy	Unsuitable	Heavily disturbed, wet, irrigated pastures, cattle pens, developed, and landscaping.
Cornfield	Unsuitable	North of and adjacent to Area 1, in active agriculture (currently corn) commonly sorghum for at several years.
68 <sup>th</sup> St. lot	Unsuitable	Northwest corner of Lucretia Ave. and 68 <sup>th</sup> St. Northwest half of lot mapped with sands, but contaminated by storage of exotic soils, mulches, gravel.
<b>Santa Ana River</b>	<b>Unsuitable</b>	Alluvial sands supporting riparian woodlands, high water table, often flooded.

## 4.2 Survey Results

Habitat conditions on the survey areas remained essentially unchanged between 2016 and 2017. DSF was not observed on the any survey area during the 2017 survey season. Lists of plants and insects observed during the course of the surveys in 2016 and 2017 are given in Appendix B. Appendix A3 presents representative views of the survey areas as found in 2016 and 2017.

## 4.3 Existing Environment and Community

### 4.3.1 Adjacent Lands

Lands to the north of survey area 1 were highly disturbed, agricultural fields. Other surrounding areas are developed to roads.

Survey area 2 has commercial-industrial development to its north (across Landon Dr.) and residential development and the operational dairy to the northeast. Disturbed agricultural and annual grasslands extend to the south and west from the survey area on mostly non-Delhi sand soils.

Survey area 3 has extensive adjacent north and west lands similar to the survey area (outside of the buffer limit) supporting exotic grasslands and dense stands of *Kochia*, *Salsola*, and *Amaranthus*. To the south, across Cantu-Galleano Ranch Rd. and east across Wineville Ave., are commercial-industrial developments; southeast across the Cantu-Galleano Ranch/Wineville intersection is an operational dairy with conditions unsuitable for DSF.

Survey area 4 has similar open fields adjacent to surveyed portions of this vacant lot to the south and west. Beyond these, all surrounding lands are developed to roads or commercial buildings.

### 4.3.2 Topography

Survey area 1, with an elevation ranging from 648 to 666 feet above mean sea level (AMSL), has rolling topography with a prominent sandy ridge (overlying a high-pressure natural gas line). Area 2 has gently rolling topography with an elevation ranging from 703 to 717 feet AMSL. Area 3 has gently rolling topography with an elevation ranging from 738 to 757 feet AMSL. Area 4 is essentially flat with an elevation of 743 to 753 feet AMSL.

### 4.3.3 Soils

Soil surveys of the area indicated Delhi fine sands (Knecht 1971). During the focused surveys, the sandy soils within the survey areas were observed to also have a high silt content.

### 4.3.4 Vegetation

Vegetation on survey area 1 consists of partially irrigated ruderal vegetation adjacent to an agricultural field. Dominant species include *Verbesina encelioides*, *Helianthus annua*, *Amaranthus albus*, *Amaranthus palmeri*, *Salsola tragus*, and *Sisymbrium irio*. Area 2 has exotic grassland and forbland dominated with *Sisymbrium* and *Verbesina*. Area 3 has vegetation dominated by very dense coverage of *Salsola*, *Chenopodium album*, *Kochia scoparia*, and *Sisymbrium* with small areas of abundant *Verbesina*. Area 4 has vegetation

dominated by *Salsola* and *Chenopodium album*. Table B1 (Appendix B) provides a list of plant species encountered on the survey areas.

#### **4.3.5 Insect Community**

During combined site visits for 2016 and 2017, at least 125 insect species (counting only large and conspicuous insects) were observed. A comprehensive list of insect species observed during the course of survey work over the two-year period is presented in Table B2 of Appendix B). The insect community encountered on the survey areas appears typical of those encountered on disturbed, fallow fields. It is noted that other insects commonly associated with DSF habitat and DSF population sites; the DSF, two species of Apioceridae, and a number of important Crabronid, Scoliid, and Bombyliid species, were not observed on any of the survey areas.

### **5.0 DISCUSSION AND CONCLUSIONS**

After finding negative results for two consecutive years of survey for the DSF, it is concluded that none of the survey areas for the RTRP support any population of DSF and thus DSF is considered absent from the project area.

It is important for the project proponent to understand that, if the survey area is not developed (or project not undertaken) before July 1, 2018, USFWS policy is to consider the current results (DSF absent the area) void, and thus their recommendation of continued consecutive years of survey until the area is developed. Should the project proponent fail to have the area surveyed for DSF in a subsequent summer season, then USFWS policy is to require a full repeat of two consecutive years of DSF survey before negative results are again acceptable to them.



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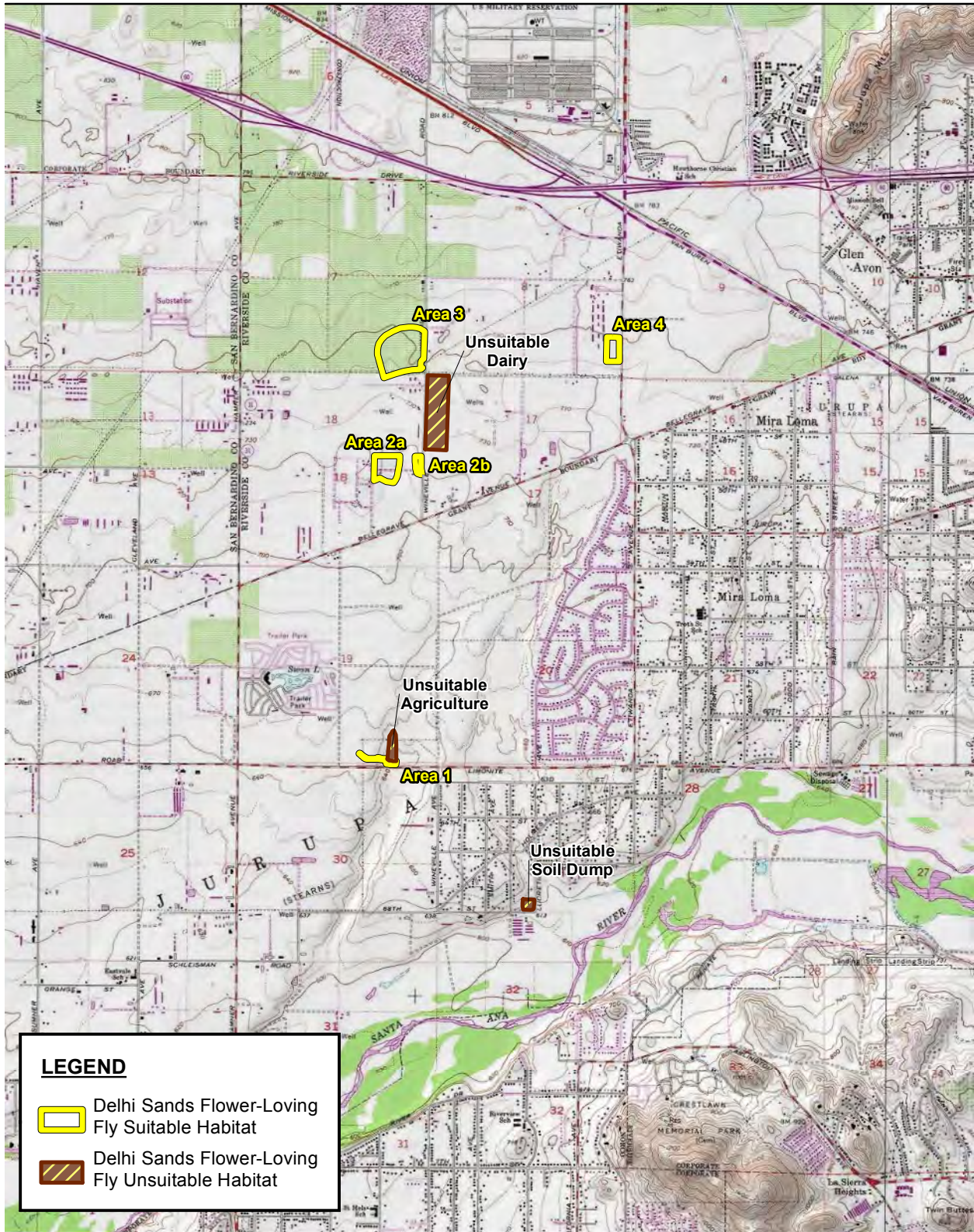
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## **APPENDICES**

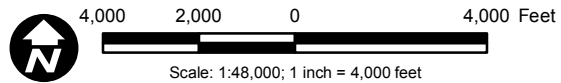
## **APPENDIX A**

### **Figures**

## **A1. Topography-based Figures**



Source: USGS 7.5" Quadrangles Guasti, California 1982, Corona North, California 1979; Osborne 2017

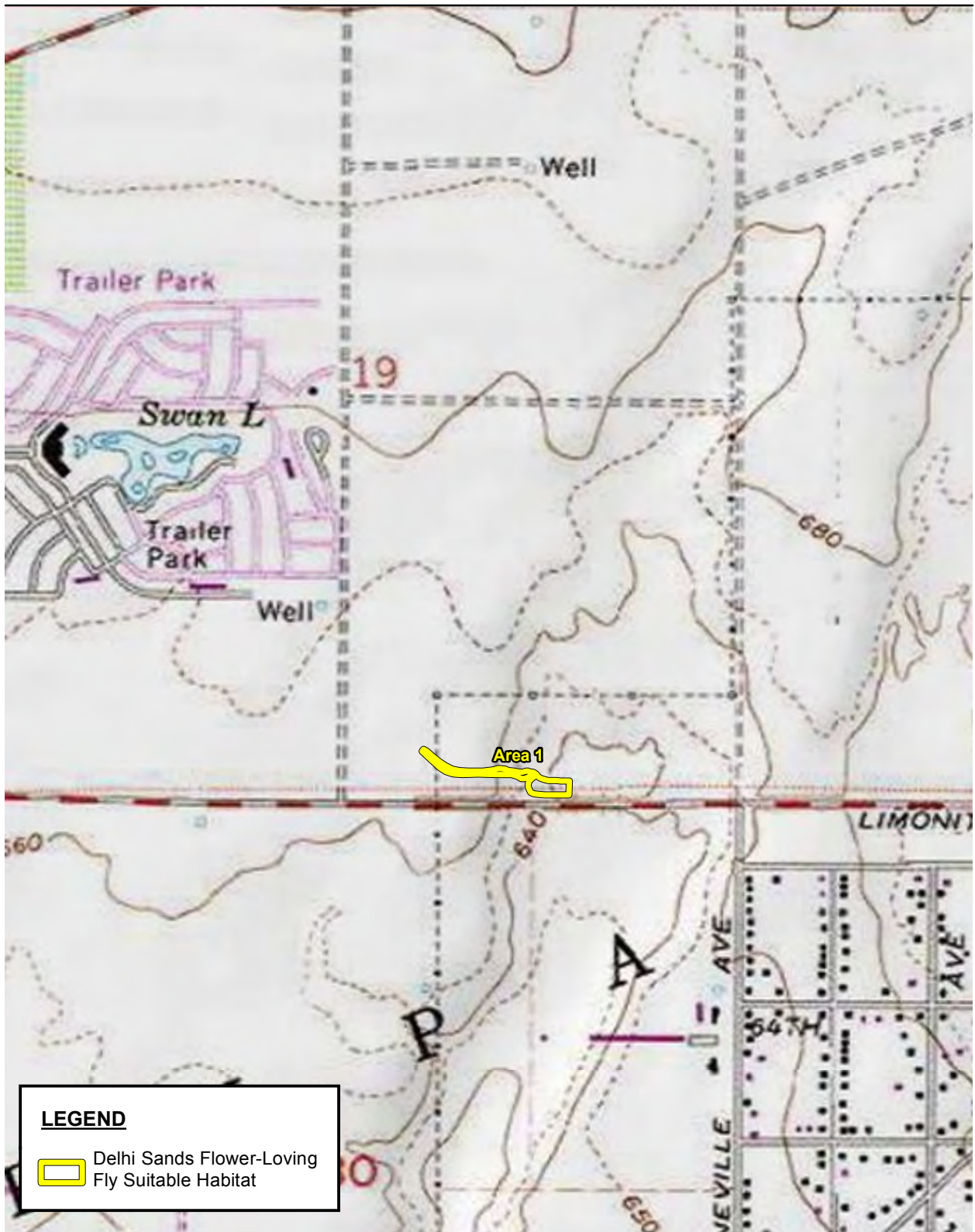


**Figure 1**  
**General Vicinity**  
**of Survey Areas**

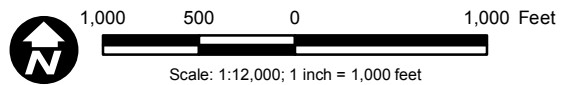
Riverside Transmission Reliability Project DSFLF Year 2 Survey

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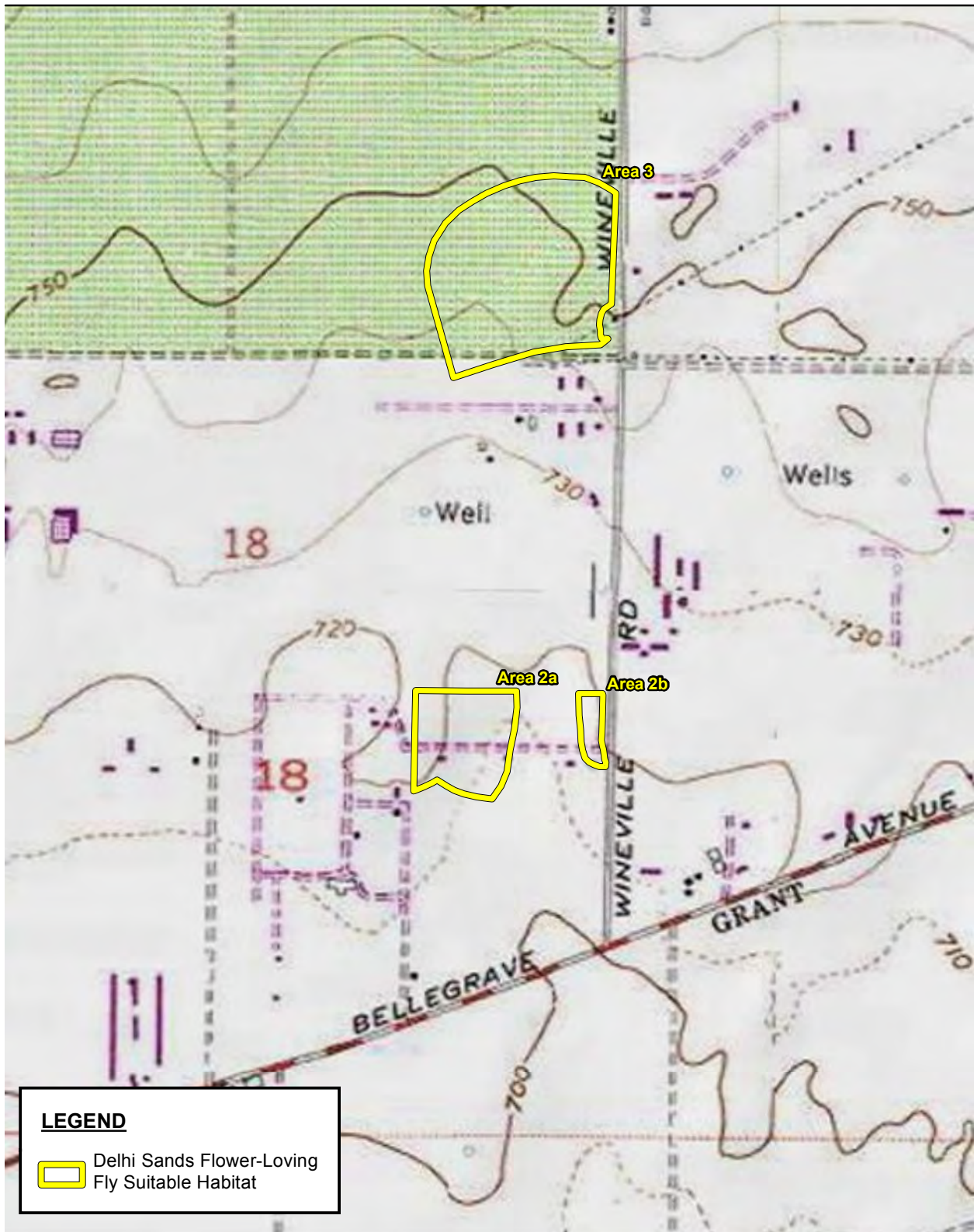




Source: USGS 7.5" Quadrangle Corona North, California 1979; Osborne 2017

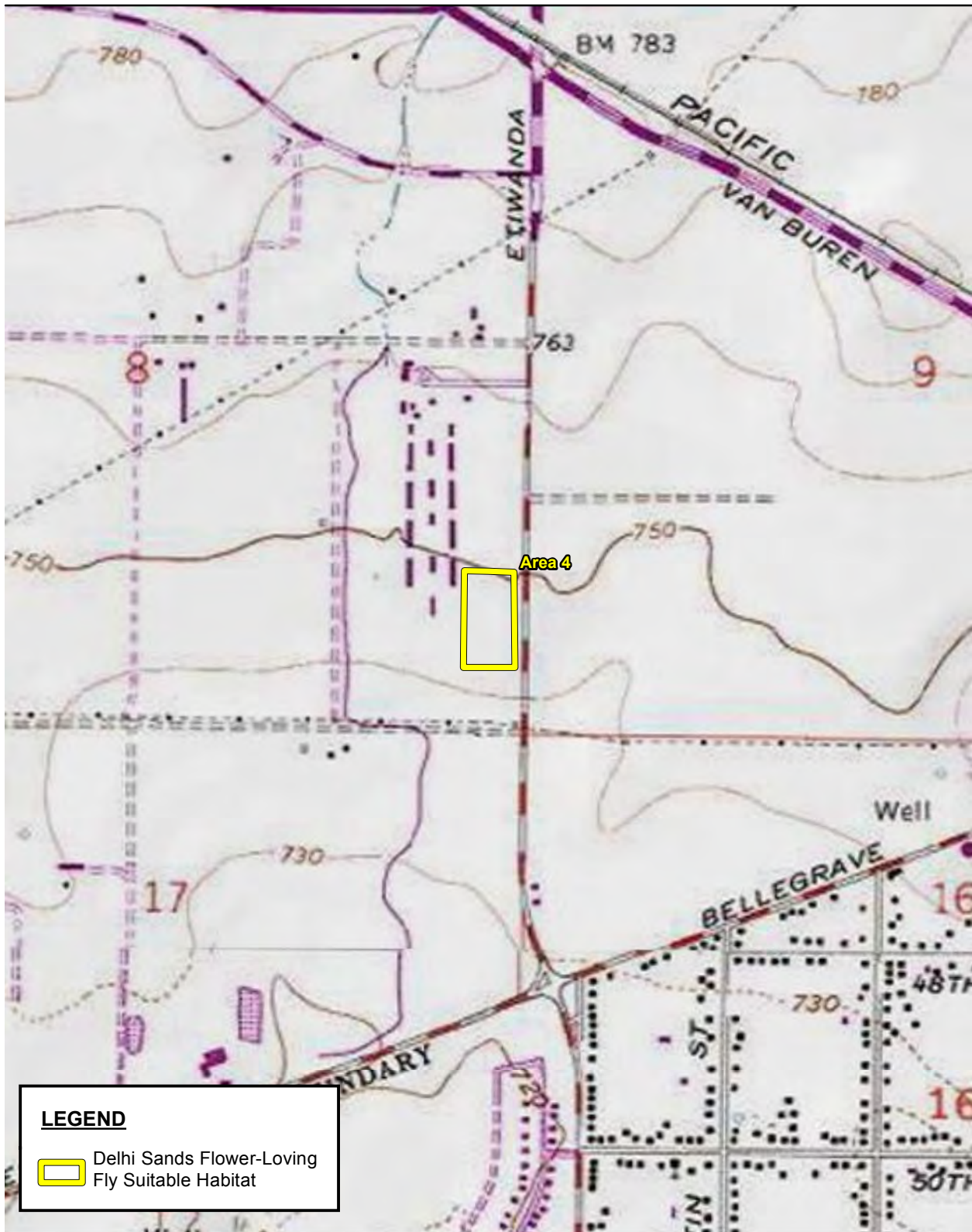


**Figure 2**  
**General Vicinity**  
**of Survey Area 1**

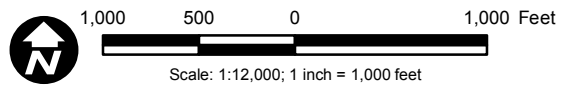


**Figure 3**  
**General Vicinity of**  
**Survey Areas 2a, 2b and 3**





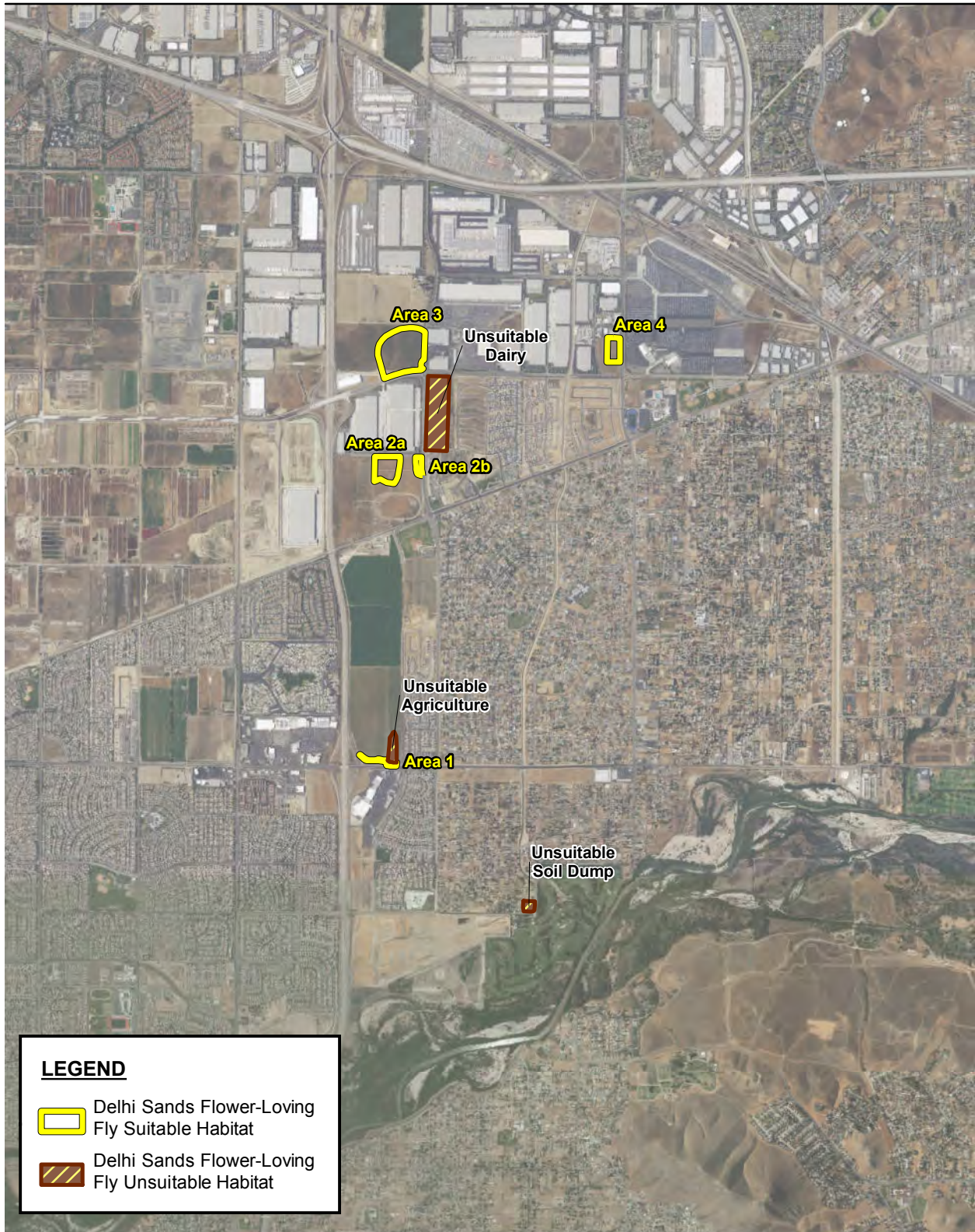
Source: USGS 7.5" Quadrangles Guasti, California 1982, Corona North, California 1979; Osborne 2017



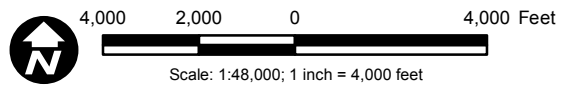
**Figure 4**  
**General Vicinity of**  
**Survey Area 4**

## **A2. Aerial-based Figures**





Source: NAIP 2016; Essex 2010; Esri 2009; Osborne 2017

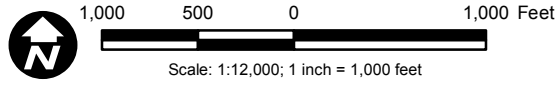


**Figure 5**  
**Aerial View**  
**of Survey Areas**





Source: NAIP 2016; Essex 2010; Esri 2009; Osborne 2017

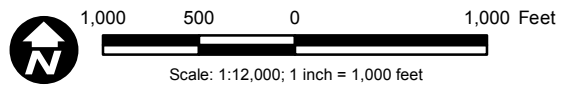


**Figure 6**  
**Aerial View**  
**of Survey Area 1**





Source: NAIP 2016; Essex 2010; Esri 2009; Osborne 2017

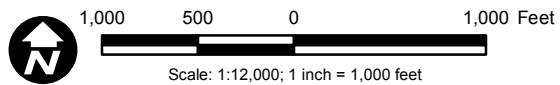


**Figure 7**  
**Aerial View of**  
**Survey Areas 2a, 2b and 3**





Source: NAIP 2016; Essex 2010; Esri 2009; Osborne 2017



**Figure 8**  
**Aerial View**  
**of Survey Area 4**

Riverside Transmission Reliability Project DSFLF Year 2 Survey

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### **A3. Representative Photos**





Figure 9. Photograph of vacant lot at the northwestern corner of Lucretia Avenue and 68th Street, (just north of the Santa Ana River). Although the northwestern corner of this lot is mapped with Delhi sands, the extensive dumping, storage, and contamination with foreign soils, mulch, and gravel, renders this site unsuitable for DSF. Photo from habitat assessment completed in 2016.



Figure 10. Photograph (June 2016) of agricultural fields (corn) immediately north of our Survey Area 1, just north of Limonite Avenue. View looks to the north. This habitat was determined to be unsuitable for the DSF.





Figure 11. Photograph (2010) of irrigated pasturelands and cattle pens as seen from the eastern edge of Wineville Ave. View looks northeast from a location approximately 700 feet north of the Wineville Ave. / Landon Dr. intersection. The dairy remains essentially unchanged to 2017.



Figure 12. Photograph (August 2017) of view through narrow Survey Area 1, just north of Limonite Avenue. This view is looking west from a central portion of the survey area site. Note extensive ruderal vegetation on this margin of an irrigated corn field (far right).





Figure 13. Photograph (August 2017) of Survey Area 2, looking west at central portion of site.



Figure 14. Photograph (August 2017) of Survey Area 3 with relictual dune on the southeastern portion of the site.



Figure 15. Photograph (August 2017) of Survey Area 4 looking northeast across site from southwest corner.

## **APPENDIX B**

### **Plant and Insect Species Encountered**

**Table B1. Plant species encountered on the survey site (2016 and 2017).**

<b>FAMILY and COMMON NAME</b>	<b>Species</b>	<b>area 1</b>	<b>area 2a</b>	<b>area 2b</b>	<b>area 3</b>	<b>area 4</b>
<b>ADOXACEAE</b>				x		
Mexican elderberry	<i>Sambucus mexicana</i>					
<b>AMERANTHACEAE</b>						
white tumbleweed	<i>Amaranthus album</i>	x				x
Palmer's amaranth	<i>Amaranthus palmeri</i>	x				
<b>ARECACEAE</b>						
fan palm	<i>Washingtonia</i>					x
<b>ASTERACEAE</b>						
sand-bur	<i>Ambrosia acanthicarpa</i>					x
mule fat	<i>Baccharis salicifolia</i>					x
flax-leaved horseweed	<i>Conyza bonariensis</i>	x				
Horseweed	<i>Conyza canadensis</i>	x				
Sunflower	<i>Helianthus annua</i>	x				
telegraphweed	<i>Heterotheca grandiflora</i>		x		x	X
golden crownbeard	<i>Verbesinia encelioides</i>	x	x	x	x	x
<b>BORAGINACEAE</b>						
ranchers fiddleneck	<i>Amsinkia intermedia</i>	x		x	x	x
<b>BRASSICACEAE</b>						
shortpod mustard	<i>Hirschfeldia incana</i>					x
London rocket	<i>Sisymbrium irio</i>	x	x	x	x	x
wild radish	<i>Raphanus sativus</i>					x
<b>CHENOPODIACEAE</b>						
red saltbush	<i>Atriplex rosea</i>					x
lamb's quarters	<i>Chenopodium album</i>	x			x	x
Kochia	<i>Kochia scoparia</i>	x			x	
russion thistle	<i>Salsola tragus</i>	x	x	x	x	x
<b>EUPHORBIACEAE</b>						
castor-bean	<i>Ricinus communis</i>	x				
<b>GERANIACEAE</b>						
red-stem filaree	<i>Erodium cicutarium</i>		x			x
<b>MYRTACEAE</b>						
Eucalyptus	<i>Eucalyptus</i>				x	x

<b>FAMILY and COMMON NAME</b>	<b>Species</b>	<b>area 1</b>	<b>area 2a</b>	<b>area 2b</b>	<b>area 3</b>	<b>area 4</b>
<b>MALVACEAE</b>						
cheeseweed	<i>Malva parviflora</i>					x
<b>PORTULACACEAE</b>						
fleshy spurg	<i>Portulaca oleracea</i>	x				
<b>SOLANACEAE</b>						
small flrs Jimson	<i>Datura stramonium</i>	x				
Jimson weed	<i>Datura wrightii</i>	x				
white nightshade	<i>Solanum americanum</i>	x				
<b>ZYGOPHYLLACEAE</b>						
Puncture vine	<i>Tribulus terrestris</i>				x	x
<b>POACEAE</b>						
slender oat	<i>Avena barbata</i>					x
wild oats	<i>Avena fatua</i>					x
Ripgut	<i>Bromus diandrus</i>					x
Foxtail chess/red brome	<i>Bromus madritensis</i>		x	x	x	x
Bermuda grass	<i>Cynodon dactylon</i>	x				
goose grass	<i>Eleusine indica</i>	x				
Mediterranean barley	<i>Hordeum murinum</i>	x	x		x	x
Sorghum	<i>Sorghum bicolor</i>	x				
Corn	<i>Zea mays</i>	x				

**Table B2. Insects encountered on the survey sites (areas 1 through 4), (2016 and 2017).**

Order	Family	Genus / species	area 1	area 2	area 3	area 4
Diptera	Mydidae	<i>Nemomydas pantherinus</i>			X	
	Asilidae	<i>Andrenosoma fulvicauda</i>	X	X	X	
		<i>Efferia albibarbis</i>	X	X	X	X
		<i>Mallophora fautrix</i>	X	X	X	X
		<i>Stenopogon brevisculus</i>	X	X	X	X
		<i>Ceratitis capitata</i>			X	
	Tephritidae	<i>Ozodiceromyia</i> sp.	X			
		Bombyliidae	<i>Aphoebantus</i> sp.			X
	<i>Exoprosopa butleri</i>				X	
	<i>Geron</i> sp.				X	
	<i>Neodiplocampta mira</i>				X	
	<i>Poecilognathus</i>				X	
	<i>Thyridanthrax atrata</i>		X	X	X	
	<i>Villa lateralis</i>		X		X	
	<i>Villa molitor</i>		X	X	X	X
	Calophoridae		<i>Lucilia sericata</i>	X		
	Muscidae	<i>Musca domestica</i>	X	X	X	X
	Sarcophagidae	<i>Sarcophaga</i> sp.	X		X	
	Scenopinidae	<i>Pseudotrichia</i> sp.			X	
	Tachinidae	<i>Exorista mella</i>			X	
<i>Leschenaultia grossa</i>				X	X	
					X	
Diptera	Stratiomyidae	<i>Stratiomys maculosa</i>				X
	Syrphidae	<i>Copostylum marginatum</i>	X			
		<i>Copostylum mexicana</i>	X	X		
		<i>Copostylum quadratus</i>	X			
		<i>Eristalis aenea</i>	X	X	X	
		<i>Eristalis stipator</i>		X	X	
		<i>Eristalis tenax</i>	X	X		
		<i>Paragus tibialis</i>	X			
	Dolichopodidae	<i>Condylostylus pilicornis</i>	X			
	Ulidiidae	<i>Chaetopsis</i> sp.		X		
<i>Euxesta</i> sp.				X		
Hymenoptera	Apidae	<i>Apis mellifera</i>	X	X	X	X
		<i>Diadasia</i> sp.	X			
		<i>Nomada</i> sp.	X	X	X	
		<i>Svastra texana</i>	X			
	Halictidae	<i>Agapostemon</i>	X	X	X	
		<i>Lasioglossum</i> sp.			X	
	Megachilidae	<i>Chalicodoma</i> sp.				X
	Formicidae	<i>Iridomyrmex humilis</i>		X		
		<i>Pogonomyrmex californicus</i>	X	X	X	X

Order	Family	Genus / species	area 1	area 2	area 3	area 4
	Chrysididae	<i>Parnopes edwardsii</i>	x	x		
		<i>Hedychyrum</i> sp.			x	
	Mutillidae	<i>Dasymutilla californica</i>		x		
		<i>Dasymutilla coccineohirta</i>			x	
	Pompilidae	<i>Ageniella</i> sp.		x		
		<i>Episyron</i> sp.			x	
	Crabionidae	<i>Cerceris sextoides</i>			x	
		<i>Gastrosericina</i> sp.		x	x	
		<i>Tachysphex</i> sp.	x	x		
		<i>Bembix comata</i>	x	x	x	x
		<i>Dryudella picta</i>			x	
		<i>Oxybellus pitanta</i>			x	
	Sphecidae	<i>Ammophila aberti</i>	x	x	x	
		<i>Ammophila azteca</i>	x	x	x	
		<i>Cerceris femurrubrum</i>		x	x	
		<i>Chlorion aerarium</i>	x	x	x	
		<i>Haplomelinus albitomentosus</i>			x	
		<i>Hoplisoides semipunctatus</i>	x			
		<i>Philanthus multimaculatus</i>		x	x	
		<i>Prionyx foxi</i>			x	
		<i>Prionyx parkeri</i>	x	x	x	x
		<i>Sceliphron caementarium</i>	x	x	x	x
	Vespidae	<i>Euodynerus annulatum</i>	x	x	x	
		<i>Polistes apachus</i>	x	x	x	x
		<i>Polistes exclamans</i>	x			
		<i>Polistes dominula</i>	x			
Coleoptera	Chrysomelidae	<i>Diabrotica balteata</i>	x			
	Coccinellidae	<i>Coccinella septempunctata</i>			x	
	Scarabaeidae	<i>Cotinus mutabilis</i>	x	x	x	x
	Tenebrionidae	<i>Elodes gracilis</i>		x	x	
Neuroptera	Chrysopidae	<i>Chrysopa</i> sp.	x		x	x
	Chrysopidae	<i>Chrysoperla</i>			x	
	Mymerliontidae	<i>Brachynemurus (small grey)</i>			x	
		<i>Brachynemurus ferox</i>	x	x	x	x
		<i>Myrmeleon californicus</i>			x	
Lepidoptera	Pyalidae	<i>Hellula rogatalis</i>			x	
	Crambidae	<i>Spoladea recurvalis</i>	x			
	Arctiidae	<i>Estigmene acrea</i>			x	
	Noctuidae	<i>Spodoptera exigua</i>			x	
	Danaidae	<i>Danaus plexippus</i>		x		
	Nymphalidae	<i>Agraulis vanillae</i>	x		x	
		<i>Junonia coenia</i>	x	x	x	
		<i>Vanessa Annabella</i>	x			



Order	Family	Genus / species	area 1	area 2	area 3	area 4
		<i>Vanessa cardui</i>	x	x	x	x
	Pieridae	<i>Colias eurytheme</i>	x	x	x	x
		<i>Eurema nicippe</i>			x	
		<i>Phoebis agarithe</i>	x			
		<i>Pieris rapae</i>	x			
		<i>Pontia protodice</i>	x	x	x	x
	Lycaenidae	<i>Brephidium exilis</i>	x	x	x	x
		<i>Strymon melinus</i>	x	x	x	x
	Hesperiidae	<i>Heliopetes erictorum</i>	x			
		<i>Hylephila phyleus</i>	x	x	x	x
		<i>Lerodia eufala</i>	x		x	
		<i>Pyrgus albescens</i>	x		x	
Hemiptera	Lygaeidae	<i>Lygaeus kalmii</i>	x			
	Miridae	<i>Lygus</i> sp.	x	x	x	x
	Pentatomidae	<i>Bagrada hiliaris</i>	x	x	x	x
		<i>Chlorochroa sayi</i>	x		x	
	Reduviidae	<i>Sinea diadema</i>			x	
		<i>Zelus tetracanthus</i>	x		x	
		<i>Zelus renardii</i>	x	x	x	
	Cicadellidae	<i>Homalodisca lacerta</i>	x	x	x	x
	Membracidae	<i>unidentified</i>		x		
Orthoptera	Acrididae	<i>Derotmemma saussuraenum</i>		x	x	x
		<i>Melanoplus</i>	x	x	x	x
		<i>Psoloessa thamnogaea</i>		x	x	
		<i>Schistocerca nitens</i>	x	x	x	
		<i>Trimerotropis californica</i>		x	x	
		<i>Trimerotropis pallidipennis</i>	x	x	x	x
		<i>Trimerotropis fontana</i>		x		
	Gryllidae	<i>Gryllus</i> sp.		x		
Mantodea	Mantidae	<i>Iris oratoria</i>	x	x	x	x
		<i>Stagmomantis</i>				x
Odonata	Coenagrionidae	<i>Argia</i>	x	x	x	x
	Aeshnidae	<i>Aeshna multicolor</i>	x	x	x	x
		<i>Anax junius</i>	x	x	x	x
	Libellulidae	<i>Libellula saturata</i>	x	x		
		<i>Pantala flavescens</i>	x	x	x	x
		<i>Pantala hymenaea</i>	x	x	x	x
Odonata	Libellulidae	<i>Perithemis intensa</i>	x			
		<i>Sympetrum corruptum</i>	x	x	x	x
		<i>Tramea onusta</i>	x	x	x	
		<i>Tramea lacerata</i>		x	x	

## **APPENDIX C**

### **Correspondence with USFWS and Field Notes**

Ken H. Osborne (permit #TE837760-10)  
6675 Avenue Juan Diaz,  
Riverside, CA 92509  
(951) 360-6461  
[Euproserpinus@msn.com](mailto:Euproserpinus@msn.com)

June 21, 2017

Attn: Ms. Stacey Love,  
USFWS Carlsbad Field Office  
2177 Salk Avenue, Suite 250  
Carlsbad, CA 92008

To Whom It May Concern:

I write to notify you of intent to conduct a second year of survey for Delhi Sands Giant Flower-loving fly (DSF, *Rhaphiomidas terminatus abdominalis*) on a series of sites totaling approximately 42.7-acres in Jurupa Valley. These areas are portions of the Riverside Transmission Reliability Project, western Riverside County.

For reference, each of the discontinuous, discrete survey areas identified as representing suitable habitat for DSF are numbered 1 through 4 (with sub parts of area 2) as follows with their approximate acreages: Area 1 of 0.9 acres on the north side of Limonite Avenue; Area 2a of 9.04 acres on the south side of Landon Dr and Area 2b of 1.5 acres at the southwestern intersection of Landon Dr. and Wineville Ave.; Area 3 of 25.84 acres on the northwestern intersection of Wineville Ave., and Cantu-Galleano Ranch Rd.; and Area 4 of 5.42 acres is located northwest of the intersection of Cantu-Galleano Ranch Rd. with Etiwanda Avenue. The total acreage of these survey areas is 42.7 acres. The study areas are located on the Guasti, and Corona North, California USGS 7.5-minute quadrangle maps, Township 2 South, Range 6 West, with site 1 in the southeastern corner of Section 19; site 2 in eastern Section 18; site 3 in southeastern Section 7 and northeastern Section 18; and site 4 in eastern Section 8. Figure 1 shows the general vicinity of the survey sites at 50% scale on the Guasti, and Corona North, California USGS 7.5-minute quadrangle maps. Figure 2 displays survey areas 1 and 2 (2a and 2b) on the Corona North, California USGS 7.5" quadrangle at 200%. Figure 3 displays survey areas 3 and 4 on the Guasti, California USGS 7.5" quadrangle at 200%.

If you have any questions or comments regarding this survey, please feel free to contact me.

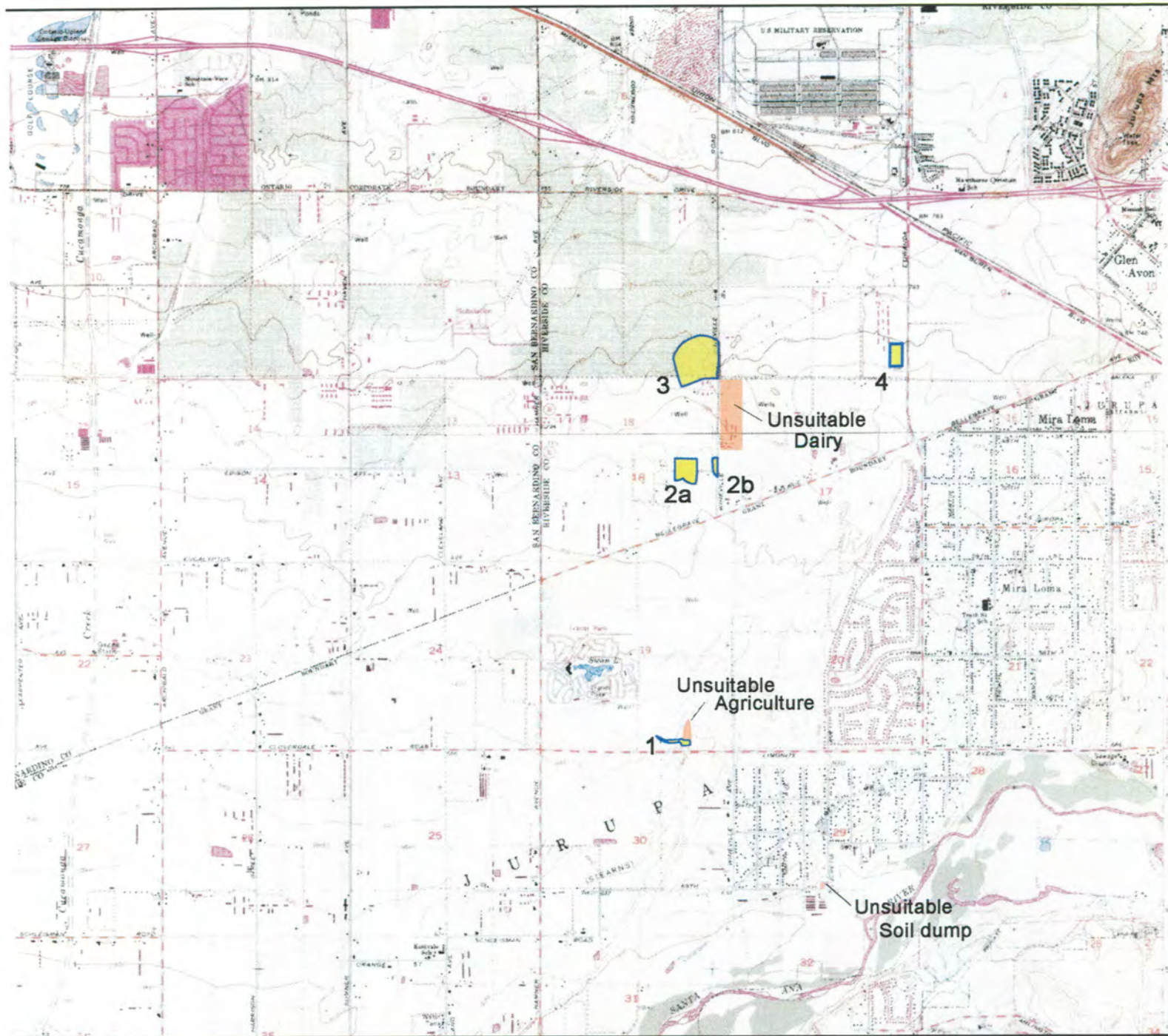
Respectfully submitted,



Ken H. Osborne

cc: Nina Kidd (Kidd Biological)

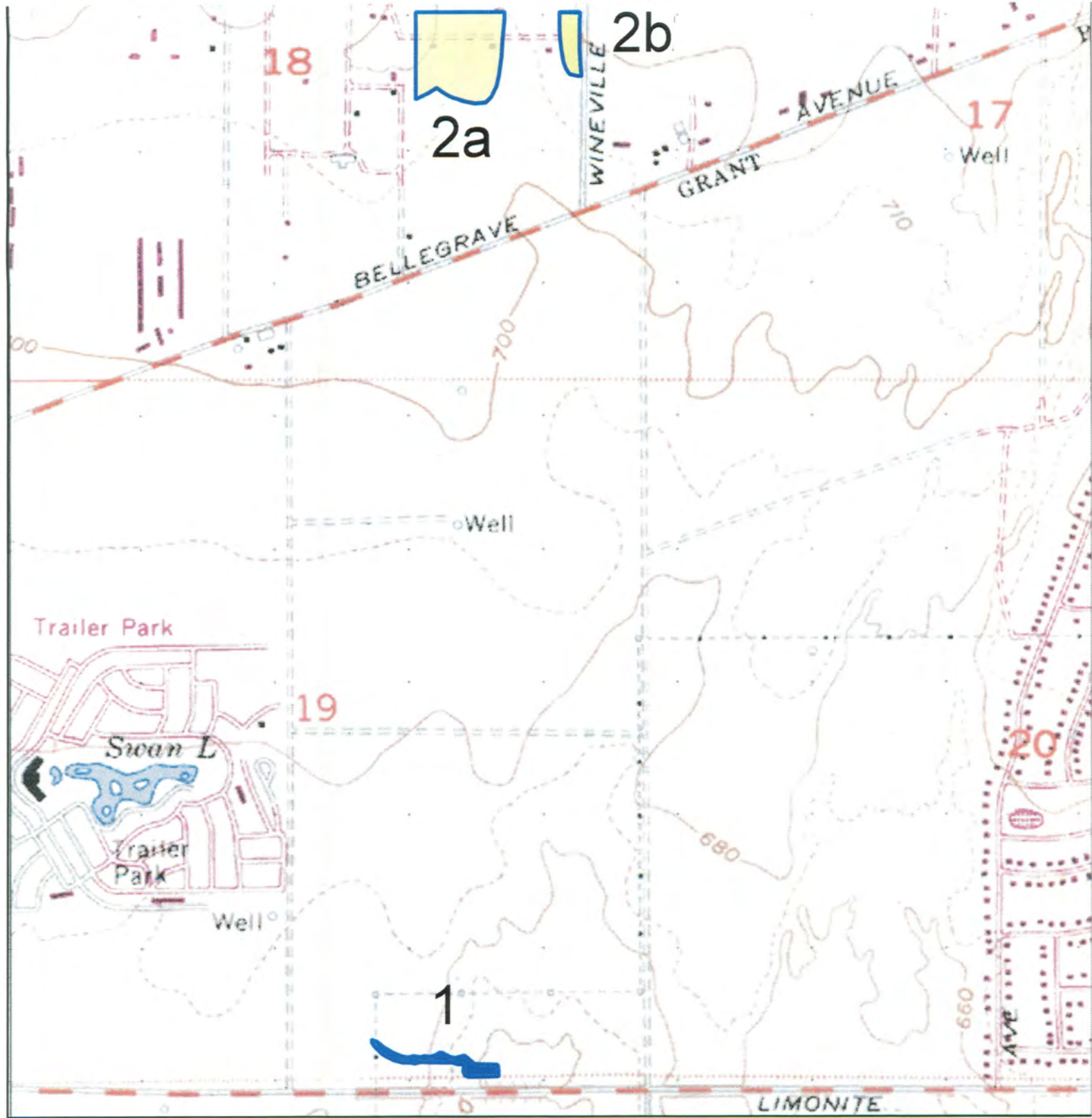




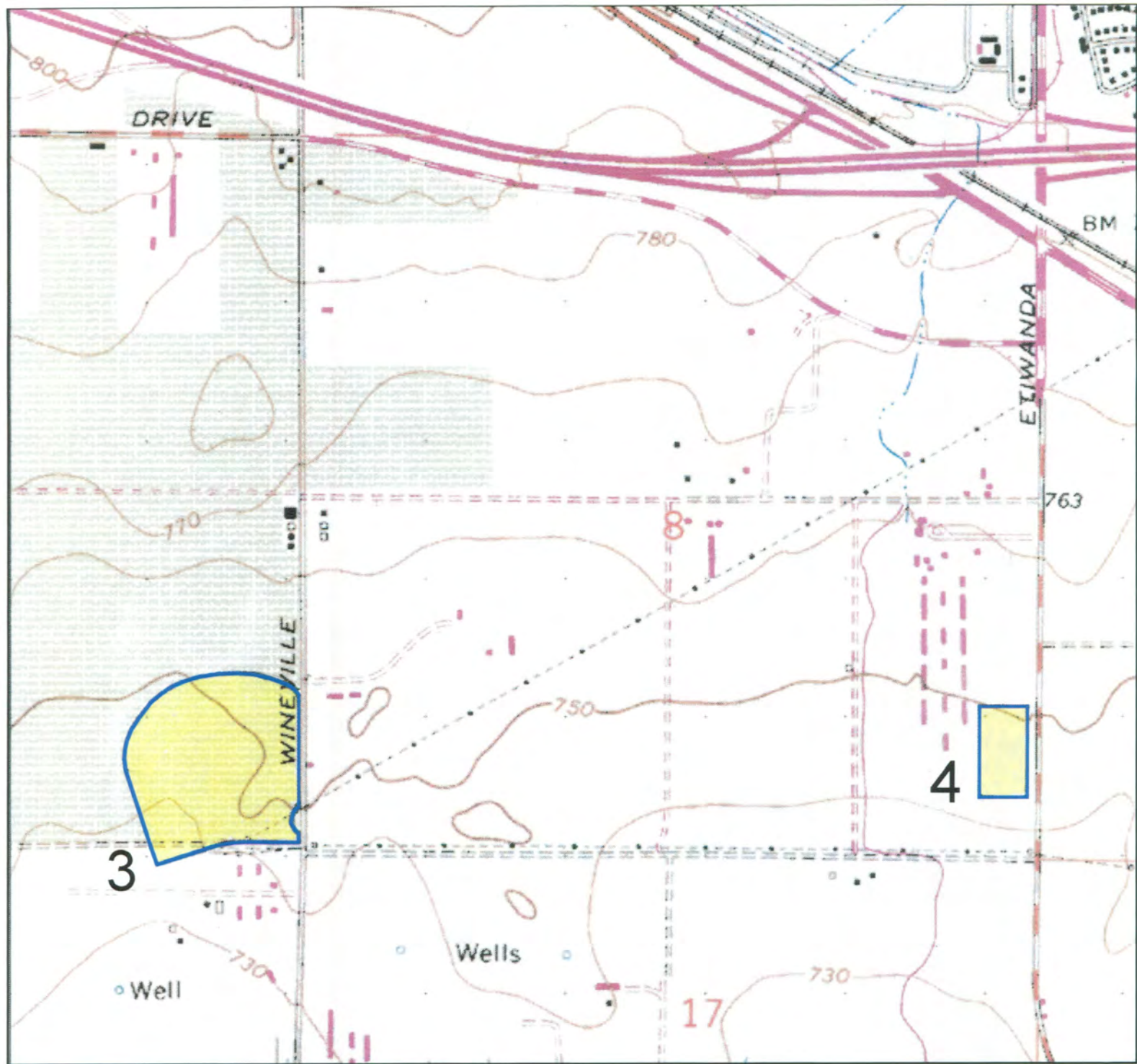
**Figure 1.** General vicinity of survey areas, Guasti, and Corona North, California USGS 7.5'' quadrangles at 50%. Project areas (numbered) are outlined in blue and highlighted in yellow. Mapped Delhi sands unsuitable for DSF are shaded orange.







**Figure 2.** General vicinity of survey areas 1 and 2 (2a and 2b), Corona North, California USGS 7.5" quadrangle at 200%. Survey areas (numbered) are outlined in blue and highlighted in yellow





July 1, 2017

**Delhi sands flower-loving fly - General Form**

Date July 1, 2017 Overall Time 4+ Jobs Edison

Surveyor Jeremiah U. George Survey Partner(s) None

Overall Mileage \_\_\_\_\_

**Weather:**

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 10:00	95%	clear patchy <u>overcast</u> drizzle shower	0-1 mph W	67°F
11:10	40%	clear <u>patchy</u> <u>overcast</u> drizzle shower	0-1 mph W	74°F
12:30	15%	clear patchy <u>overcast</u> drizzle shower	2-3 mph	79°F
Stop 1400	0	<u>clear</u> patchy overcast drizzle shower	2-3 mph	81°F

Site #	Time	Mileage on site
<u>1</u>	<u>945-10:00</u> to <u>1015</u>	_____
<u>3</u>	<u>1020</u> to <u>12:35</u>	_____
<u>2A</u>	<u>1240</u> to <u>13:24</u>	_____
<u>2B</u>	<u>13:24</u> to <u>1332</u>	_____
<u>4</u>	<u>1335</u> to <u>1440</u>	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____

**Biological elements:**

*Rhaphiomidas terminatus* ? NO time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_


Other arthropods (general) Bombyliids  Asilids   
 Mydids \_\_\_\_\_ Apiocerids \_\_\_\_\_ Sphecids   
 Pompillids \_\_\_\_\_ Scoliids \_\_\_\_\_ Chrysidids  (very small green wasp)

Other insects of note peganomyia sp. (collet?), Cataglyphis, Apis, Anthophora sp.  
Dactylis, catidus, Bombyx, rhabdomyia, Acridid sp.  
Diapriid wasps on scrub, western swallowtail, Asilid (black body)  
Microgaster wasp - / Ammophila sp., Brevichneumonid, Bombyx son, Arctia sp.

Comments:  
Floca: Anisakia (site 3), Heterotheca (site 3),  
single Artemesia collet at 2A

Vertebrates:  
cotton-tail, GSO, birds, western fence, TV, RTH,

*3-5 mm*  
*Red*  
*with*  
*black abdomen*



Delhi sands flower-loving fly - General Form

Date 5 July 2017 Overall Time 1000-1400 Jobs EDISON  
 Surveyor David K. Faulkner Survey Partner(s) Ø  
 Overall Mileage Redondo Beach → Oceanside → R.B.

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1000	Ø HAZE	clear patchy overcast drizzle shower	1-2	84°
1100	Ø HAZE	clear patchy overcast drizzle shower	2-3	85°
1200	Ø HAZE	clear patchy overcast drizzle shower	2-3	95°
Stop 1400	70% high obs	clear patchy overcast drizzle shower	7-5	99°

Site #	Time	Mileage on site
EDISON 1	1000 to 1005	192143
EDISON 2A	1017 to 1004	192145
EDISON 2B	1005 to 1103	192145
EDISON 3	1105 to 1330	192146
EDISON 4	1334 to 1400	192148
	to	
	to	
	to	
	to	
	to	
	to	
	to	

Biological elements:  
*Rhaphiomidas terminatus*? \_\_\_ time \_\_\_ sex \_\_\_ numbers \_\_\_

Other arthropods (general) Bombyliids  Asilids   
 Mydids \_\_\_ Apiocerids \_\_\_ Sphecids   
 Pompilids  Scoliids \_\_\_ Chrysidids \_\_\_

Other insects of note  
 EDISON 1: Bombyliids, *Bombix*, *C. eumytila*, *Picrosphenites*, *Conopid*, *Syrphids*, *Anthomyid*, *Cestria*  
 EDISON 2A/2B: Bombyliids, Asilids, *Bombix*, *Sphid* spider wasps, Fairy skipper, *P. rufipes*, *Popillia*, *Argentine* Ants.  
 EDISON 3: *Pepsis*, *Membracid*, Bombyliids, *Pentatomids*, *M. domestica*, *Pedunculids*, *Alabids*, *Bombix*  
 EDISON 4: *A. mellifera*; *Andrenid* bees, Bombyliids, *Grasshoppers*, *conopid*, *A. mellifera*, *Pogonomyza*

Comments:  
 E2A/B: 35+ *C. Monticola*, lizards, Turkey vulture, ground squirrel Habitat closed in with mustard (dead)  
 E3: Very overgrown since last year.

Vertebrates: \_\_\_\_\_



Delhi sands flower-loving fly - General Form

Date 7/9/2017 Overall Time 10:00-14:00 Jobs Edison  
 Surveyor E Renfro Survey Partner(s) N/A

Overall Mileage \_\_\_\_\_

Weather: 5-10

Time (24 hr)	% Cloud	Sky					Winds (mph)	Temp (F)
Start <u>10:00</u>	<u>15</u>	clear	<u>patchy</u>	overcast	drizzle	shower	<u>1</u>	<u>91</u>
<u>11:00</u>	<u>5</u>	clear	<u>patchy</u>	overcast	drizzle	shower	<u>1</u>	<u>96</u>
<u>12:00</u>	<u>10-15</u>	clear	<u>patchy</u>	overcast	drizzle	shower	<u>2-2</u>	<u>98</u>
Stop <u>2:00</u>	<del>60-70</del>	clear	<u>patchy</u>	overcast	drizzle	shower	<u>2</u>	<u>101</u>

Site #	Time	Mileage on site
<u>1</u>	<u>10:00 to 10:15</u>	_____
<u>3</u>	<u>10:20 to 12:35</u>	_____
<u>4</u>	<u>12:38 to 1:04 (13:04)</u>	_____
<u>2a</u>	<u>1:08 to 1:52 (13:52)</u>	_____
<u>2b</u>	<u>1:52 to 2:06 (14:00)</u>	_____
_____	to _____	_____
_____	to _____	_____
_____	to _____	_____
_____	to _____	_____
_____	to _____	_____
_____	to _____	_____

Biological elements:  
*Rhaphiomidas terminatus*? N/A time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_

Other arthropods (general) Bombyliids  Asilids   
 Mydids \_\_\_\_\_ Apiocerids \_\_\_\_\_ Sphecids   
 Pompillids  Scoliids \_\_\_\_\_ Chrysidids   
 Other insects of note Efferia albibarbis, Hemipenthes sinuosa,  
Villa melifera, Acetia (A. curaga), Opisthomyia mexicana,  
Dasyneura coccineohirta, Diogmites pulcher, Microbembix  
californica, Pamopis edwardsii

Comments: Diogmites at both #3 + 2a  
1 Sky conditions were variable 2 sites 4 + 2 [collective]  
dead veg. dust bowls.

Vertebrates: Red Tail Hawk

Date July 12, 2017 Overall Time 3 hrs. 52 min.

Jobs Edison

Surveyor Zick Rogers Survey Partner(s) 0

Overall Mileage 215720 - 215725

Weather:

Time (24 hr)	% Cloud	Skv	Winds (mph)	Temp (F)
Start 10:00	0	clear patchy overcast drizzle shower	1-3	88
11:30	0	clear patchy overcast drizzle shower	1-4	92
1:00	0	clear patchy overcast drizzle shower	2-6	96
Stop 1:56	0	clear patchy overcast drizzle shower	2-4	98

Site #	Time	Mileage on site
<u>1</u>	<u>10:00 to 10:15</u>	<u>215720</u>
<u>3</u>	<u>10:25 to 12:29</u>	<u>215722</u>
<u>2a</u>	<u>12:32 to 1:17</u>	<u>215723</u>
<u>2b</u>	<u>1:17 to 1:25</u>	<u>215723</u>
<u>4</u>	<u>1:30 to 1:56</u>	<u>215725</u>
	to _____	
	to _____	
	to _____	
	to _____	
	to _____	
	to _____	
	to _____	
	to _____	
	to _____	
	to _____	

Biological elements:

*Rhaphiomidas terminatus*? \_\_\_\_\_ time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_ *Amphiphila azteca*

*Sarcophaga luteus*

*Noodiplocampa mird*

*Eristalinus aeneus*

Other arthropods (general)  Bombyliids  Asilids

Mydids  Apioicerids \_\_\_\_\_ Sphecids

Pompillids \_\_\_\_\_ Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note *Villa molitor*, *Trimenotropis californicus*, *Nomia nevadensis* sp. (fg.)

*Bembix comata*, *Svastra texana*, *Sceliphron*, *Coffinids*, *Stenomacrus*

*Colias eurytheme*, *Pieris protodice*, *Megachile perihirta*, *Prionyx parkeri*, *Stenomacrus hirticornis*, *Stenomacrus brevisculus*, *Nemomydas*, *Geron* sp., *Bexilis*,

*Eleis*  
*trianta*  
*Plebejus*  
*demmon*  
*Aphyllus*  
*amea*  
*ovata*  
*Sinea* sp.  
*Nomada* sp.  
*hilantus*  
*ventilabris*



Date July 17, 2017

Overall Time 3 hrs. 56 min.

Jobs Edison

Surveyor Rick Rogers

Survey Partner(s) 0

Overall Mileage 216332 - 216337

Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 10:00	0	clear patchy overcast drizzle shower	2-3	87
11:00	0	clear patchy overcast drizzle shower	1-4	94
12:00	0	clear patchy overcast drizzle shower	3-5	97
Stop 1:56	0	clear patchy overcast drizzle shower	5-8	99

Site #

Time

Mileage on site

<u>1</u>	<u>10:00</u> to <u>10:15</u>	<u>216332</u>
<u>3</u>	<u>10:35</u> to <u>12:29</u>	<u>216334</u>
<u>2a</u>	<u>12:32</u> to <u>1:17</u>	<u>216335</u>
<u>2b</u>	<u>1:17</u> to <u>1:25</u>	<u>216335</u>
<u>4</u>	<u>1:30</u> to <u>1:56</u>	<u>216337</u>
	to	
	to	
	to	
	to	
	to	
	to	
	to	
	to	

Biological elements:

*Rhaphiomidas terminatus*? time sex numbers

*Gastrosericina* sp. observed a flycatcher eating an *E. acrea* moth  
*Ammophila aberti*, *Prionyx parvulus*  
*Stenopogon brevicaudus*, *Livid* sp. (19), *Haplomelanus albitomatus*, *Pantala*, *Strymon melinus*, *Nomada*  
 Other arthropods (general) Bombyliids  Asilids  *Flaveolus*, *Cofinus*, *Chlorochroa* sp.  
*Plebeius acron* Mydids  Apiocerids  Sphecids  *Dryobella picta*, *Melessodes* sp.  
*Sinea* sp. Pompillids  Scoliids  Chrysidids *Megachile* sp. (max size)  
*Philanthus pacificus* Other insects of note *Megachile perihirta* ♀!  
*Sceloporus*, *Ectopis albibarbis*, *Ammophila azteca*, *Agapostemon texanus*, *B. exilis*, *Bombix conata*  
*Crematogaster*, *H. phytocis*, *Cerieris femurbrunni*, *Villa molitor*, *Nesodiplocampa mira*,  
*Pyrus albescens*, *Shistocerca nitens*, *Philanthus multifacata*, *Brachymeria* sp., *Trimerotropis californica*

## Delhi sands flower-loving fly – General Field Form

Date 7/21/2017 Overall Time \_\_\_\_\_Job EDISONSurveyor Jeremiah U. George Survey Partner(s) None

Mileage \_\_\_\_\_

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 10 AM	0	(clear) patchy overcast drizzle shower	3-4	81°F
11 AM	0	(clear) patchy overcast drizzle shower	2-3 mph	85°F
12	0	(clear) patchy overcast drizzle shower	4 mph	89°F
Stop 13		(clear) patchy overcast drizzle shower	6 mph w/sw	93°F
1400	0	clear	8 mph w/sw	95°F

## Biological elements:

*Rhaphiomidus terminatus*? NO time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_Other arthropods (general) Bombyliids  Asilids Mydids \_\_\_\_\_ Apiocerids \_\_\_\_\_ Sphecids Pompilids \_\_\_\_\_ Scoliids \_\_\_\_\_ Chrysidids Other insects of note Diptera: Syrphidae, Tephritidae, Microlepidoptera, Hemiptera: Coreidae, Cicadellidae, Dermaptera, and other common.Plants: *Croton* \_\_\_\_\_ Telegraph weed  *Eriogonum fasciculatum* \_\_\_\_\_*Eriogonum thurberi* \_\_\_\_\_ other *Eriogonum* \_\_\_\_\_ *Oenothera* \_\_\_\_\_*Camissonia* minor *Eriastrum* \_\_\_\_\_Others: *Manopodion* <sup>in nest</sup> ~~nest~~, *Amsinckia*, A4 calif (single individual @ 2A)Vertebrates: 1A, G5Q, Western Kingbird, RTH, TV, cottontail @ 2A/2B

## Comments:

Area 3 START 10-1215

Area 4 12:20-1246

Area 2<sup>A+B</sup> 12:52-130

Area 1 140-200



## Delhi sands flower-loving fly - General Form

Date 24 July 2017 Overall Time 3.5 hrs. Jobs EDISONSurveyor DAVID K. FAULKNER Survey Partner(s) ØOverall Mileage 3 mi (on sites) (194545) 59 mi. (RB → L:mate)

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1000	99%	clear patchy <u>overcast</u> drizzle shower	1-2	79°
1105	99%	clear patchy <u>overcast</u> <u>drizzle</u> <u>shower</u>	1-2	78°
1200	98%	clear patchy <u>overcast</u> <u>drizzle</u> shower	0-1	79°
Stop 1400	95%	clear <u>patchy</u> <u>overcast</u> drizzle shower	1-2	77°

Site #	Time	Mileage on site
<u>EDison 1</u>	<u>1000</u> to <u>1015</u>	<u>194545</u>
<u>EDison 2A</u>	<u>1017</u> to <u>1104</u>	<u>194547</u>
<u>EDison 2B</u>	<u>(1105)</u> to <u>(1113)</u> Rain	<u>194547</u> ] sk: ppad
<u>EDison 3</u>	<u>1145</u> to <u>1330 1400</u>	<u>194548</u>
<u>EDison 4</u>	<u>(1334)</u> to <u>(1400)</u>	]
	to	
	to	
	to	
	to	
	to	
	to	
	to	

## Biological elements:

*Rhaphiomidas terminatus*? \_\_\_\_\_ time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_

Other arthropods (general) Bombyliids \_\_\_\_\_ Asilids \_\_\_\_\_

Mydids \_\_\_\_\_ Apiocerids \_\_\_\_\_ Sphecids 

Pompillids \_\_\_\_\_ Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note: EDison 1 = Cotinus, Gulf fritillary, Dasynutilla ♀ (red), flying sk: pper  
ED 2A/2B: Trichoptera, Libellula dragonfly, Syrphids, Piprotidae, Syrphids (4 species), Vespids, BombyxED 3 - (Began again @ 1150 lost 35min.) Hymenoptera (Bachymerus ♂)  
Apis, Chlorocera sayi, Arctiid larvae on Tumbleweed,

## Comments:

1045 - Rain - Survey halted @ 1055 / ED 2B "canceled"1145 - Survey began again - lost 30min.1300 - 83° 1-2 mph 90% clds.NEED TO FINISH EDISON 2B = 4

Vertebrates:



Delhi sands flower-loving fly - General Form

Date 7/25/2017 Overall Time 10:00 - 10:37

Jobs Edison (2b, 4)

Surveyor Eric Rentro Survey Partner(s) \_\_\_\_\_

Overall Mileage \_\_\_\_\_

Weather:

Time (24 hr)	% Cloud	Sky					Winds (mph)	Temp (F)
Start <u>10:00</u>	<u>10-15</u>	clear	<u>patchy</u>	overcast	drizzle	shower	<u>1-2</u>	<u>83</u>
		clear	<u>patchy</u>	overcast	drizzle	shower		
		clear	<u>patchy</u>	overcast	drizzle	shower		
Stop <u>10:37</u>	<u>10-15</u>	clear	<u>patchy</u>	overcast	drizzle	shower	<u>1-2</u>	<del>84</del> <u>85</u>

Site #	Time	Mileage on site
<u>2b</u>	<u>10:00</u> to <u>10:08</u>	<u>16.</u>
<u>4</u>	<u>10:11</u> to <u>10:37</u>	
	to	
	to	
	to	
	to	
	to	
	to	
	to	
	to	
	to	

Biological elements:

*Rhaphiomidas terminatus*? time N/A sex A numbers \_\_\_\_\_

Other arthropods (general) Bombyliids \_\_\_\_\_ Asilids

Mydids \_\_\_\_\_ Apiocerids \_\_\_\_\_ Sphecids

Pompillids  Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note Meagachile sp., Colinus texanus, Bombix comata, Anax junius, Colias eurythemis, Enallagma

Comments:

Vertebrates:





## Delhi sands flower-loving fly - General Form

Date 30 July 2017 Overall Time 4 hrs. (1000-1400) Jobs EDISON SITESSurveyor DAVID K. FAULKNER Survey Partner(s) ØOverall Mileage (on site) 5 miles (59 mi)

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1000	Ø HAZE	<u>clear</u> patchy overcast drizzle shower	0-1	80°
1100	Ø HAZE	<u>clear</u> patchy overcast drizzle shower	0-1	88°
1300	Ø HAZE	<u>clear</u> patchy overcast drizzle shower	2-4	92°
Stop 1400	Ø HAZE	<u>clear</u> patchy overcast drizzle shower	2-3	91°

Site #	Time	Mileage on site
Edison 1	1000 to 1015	195356
Edison 2A	1017 to 1104	195358
Edison 2B	1105 to 1113	195358
Edison 3	1115 to 1330	195359
Edison 4	1334 to 1400	195361
	to	
	to	
	to	
	to	
	to	
	to	
	to	

## Biological elements:

*Rhaphiomidas terminatus* ? \_\_\_ time \_\_\_ sex \_\_\_ numbers \_\_\_Other arthropods (general) Bombyliids  Asilids   
Mydids \_\_\_ Apiocerids \_\_\_ Sphecids   
Pompillids \_\_\_ Scoliids \_\_\_ Chrysidids \_\_\_Other insects of note: E-1: *Xylocopa*, *Scaphids*, *Bombuliids*, *Ichneumonid*, *Dacnusa* (1st red)  
*S. melinus*, *Bombix*, *Paniscus*, *Ichneumonid*, *B. exilis*, *Flying skipper*, *Catantops*, *Pogonomyia*  
E-2A/E-2B: Grasshoppers, dragonflies, Asilids, Mud-dauber wasp, Agapostemon bee.  
E-3: "Libellula" dragonfly, Myrmecoleon, *Brachymerus*, *Bombix*, *Bombuliids* (3 sp.), *Schistocerca*  
other grasshoppers.E-4: *S. melinus*, Flying skipper, Acmon blue, Apis, *Pogonomyia*, *Selenopis* tending scale.

## Comments:

Ø Mydids @ E-3.

## Vertebrates:

ED 2A/B: Turkey Vultures (dead cotton tail), Ground Squirrels

Date Aug 2, 2017 Overall Time 3 hrs. 56 min.

Jobs Edison

Surveyor Rick Rogers Survey Partner(s) 0

Overall Mileage 11926 - 11931

Weather:

Time (24 hr)	% Cloud	Skv	Winds (mph)	Temp (F)
Start 10:00	90	clear (patchy) overcast drizzle shower	0-0	86
10:49	90	clear (patchy) overcast drizzle shower	0-1	92
12:30	90	clear (patchy) overcast drizzle shower	1-2	95
Stop 1:54	90	clear (patchy) overcast drizzle shower	0-1	95

Site #	Time	Mileage on site
<u>1</u>	<u>10:00 to 10:15</u>	<u>11926</u>
<u>3</u>	<u>10:29 to 12:29</u>	<u>11928</u>
	to	
<u>2a</u>	<u>12:32 to 1:17</u>	<u>11929</u>
<u>2b</u>	<u>1:17 to 1:25</u>	<u>11929</u>
<u>4</u>	<u>1:30 to 1:54</u>	<u>11931</u>
	to	
	to	
	to	
	to	
	to	
	to	

Biological elements:

*Rhaphiomidas terminatus* ? time \_\_\_\_ sex \_\_\_\_ numbers \_\_\_\_

*Episyrna* sp. *Coadylo stylus* sp.  
*Melissodes* sp. *Trimastix palidipennis* *Agapostemon* *terana*  
 Other arthropods (general)  Bombyliids  Asilids  *Trimastix californica*  
*Prionyx parkii* Mydids  Apiocerids  Sphecids  *Scutellid* Bug (on *Verbena*)  
*Villa molitor* Pompillids  Scoliids  Chrysidids  *Lasioxys* sp. *Cylindromyia* sp.  
*Strymon melinus* Other insects of note *Amphipiza azteca* *Brachymyrmex* sp., *Cotinus*, *Evodyneurs* sp.  
*Paropos edwardsii* *Eraconid* (sm. rad) *Bombix comata*, *Chlorochroa* sp., *Seliphron caematarium*  
*Philanthus ventralis* *Pantella hymenaea*, *H. phylaeus*, *Copestylus mexicana*, *E-acrea*, *Philanthus motinatus*, *Micromophorus* sp.



## Delhi sands flower-loving fly - General Form

Date 8/4/2017 Overall Time 10<sup>00</sup>-2<sup>00</sup>Jobs FieldworkSurveyor K.A. Osborne Survey Partner(s) [Signature]Overall Mileage 383-389

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start <u>10<sup>00</sup></u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>3-4</u>	<u>89</u>
<u>11<sup>58</sup></u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>1-5</u>	<u>93</u>
<u>1<sup>20</sup></u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>4-7</u>	<u>95</u>
Stop <u>2<sup>00</sup></u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>5-8</u>	<u>96</u>

Site #	Time	Mileage on site
<u>1</u>	<u>10<sup>00</sup></u> to <u>10<sup>15</sup></u>	<u>383</u>
<u>3</u>	<u>10<sup>22</sup></u> to <u>12<sup>37</sup></u>	<u>386</u>
<u>26</u>	<u>12<sup>39</sup></u> to <u>12<sup>47</sup></u>	<u>387</u>
<u>29</u>	<u>12<sup>47</sup></u> to <u>1<sup>31</sup></u>	<u>1</u>
<u>4</u>	<u>1<sup>34</sup></u> to <u>2<sup>00</sup></u>	<u>389</u>
	to	
	to	
	to	
	to	
	to	
	to	
	to	

## Biological elements:

*Rhaphiomidas terminatus*? \_\_\_ time \_\_\_ sex \_\_\_ numbers \_\_\_.

Other arthropods (general) Bombyliids  Asilids   
 Mydids \_\_\_ Apiocerids \_\_\_ Sphecids   
 Pompillids  Scoliids \_\_\_ Chrysidids Mutillid. 1 ✓

Other insects of note

1: Bombyx, Anomophis g. r. l. c. A. grandis, V. annulata  
Scalophora, Eristalis 3: Stenopogon Bombyx Procyphidius  
Hylophila Pepsis Mylodytes Mutillid 7. californica Ulla molitor  
Janaria, V. cardui 29: Bombyx Anomophis g. r. l. c. A. aketari,  
 Comments: Prionyx, Tachegaster elongatus, Ulla f. Pepsis

Vertebrates:



## Delhi sands flower-loving fly – General Field Form

Date 8/5/17 Overall Time 1135 - ~~2000~~ 140 Job Redison  
 Surveyor KAO Osborne Survey Partner(s) 0

Mileage 431 - 438

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start <u>1135</u>		<u>clear</u> patchy overcast drizzle shower	<u>1-3</u>	<u>91</u>
<u>1200</u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>0</u>	<u>92</u>
<u>100</u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>4-5</u>	<u>93</u>
Stop <u><del>2000</del></u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>0</u>	<u>96</u>

7:140

## Biological elements:

*Rhaphiomidas terminatus*? \_\_\_ time \_\_\_ sex \_\_\_ numbers \_\_\_.

Other arthropods (general) Bombyliids \_\_\_ Asilids   
 Mydids \_\_\_ Apiocerids \_\_\_ Sphecids  Mutillidae  
 Pompillids  Scoliids \_\_\_ Chrysidids \_\_\_

Other insects of note 1: *Bombix*, *Scaliphora*, *Mallophaga*, *Pantia*, *Junonia*, *Agrotis*  
 2a *Bombix*, *Agrotis*, *Tananaos* / 2a: *Pantia*, *Bombix*, *Pogonomyza*, *Popsis thysa*,  
*Amorpha*, *Scaliphora*, *Dasyneura*, *Gymnetron* / 4: *Pantia*, *Brachidontes*,  
*Colletes*, *Evansia*, *Phaenocarpa* / 3: *Bombix*, *Mutillidae*, *Myrmica*, *Lasius*,  
*T. californica*, *Mallophaga*, *Pantia*, *Catantops*, *Stenopogon*, *Colletes*,  
*V. malitor*

Vertebrates: \_\_\_\_\_

## Comments:

SA

	Time	mi
<u>1</u>	<u>1135-1145</u>	<u>431</u>
<u>2a</u>	<u>1149-1157</u>	<u>434</u>
<u>2a</u>	<u>1157-1241</u>	<u>11</u>
<u>4</u>	<u>1245-1:11</u>	<u>436</u>
<u>3</u>	<u>1:15 - <del>2:00</del> 140</u>	<u>438</u>

(need additional time for #3 ~~at 1:40~~)

## Delhi sands flower-loving fly – General Field Form

Date 8/6/2017 Overall Time 1125 - 115 Job Edison, part 3Surveyor K.A. Osborne Survey Partner(s) ✓Mileage 0628

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start <u>1125</u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>0-1</u>	<u>83</u>
<u>1226</u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>2-4</u>	<u>86</u>
		clear patchy overcast drizzle shower		
Stop <u>115</u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>3-5</u>	<u>90</u>

## Biological elements:

*Rhaphiomidas terminatus*? \_\_\_ time \_\_\_ sex \_\_\_ numbers \_\_\_.

Other arthropods (general) Bombyliids  Asilids   
 Mydids  Apiocerids \_\_\_ Sphecids   
 Pompillids  Scoliids \_\_\_ Chrysidids  Mut.   
 Other insects of note Dry 6, rad. mutoid, chlorion, stenopogon  
Nemomydas, Paruopas Hemis, Pontia, Chrysochlamys, Stenopogon,  
Hylephila, Melipotis ♀, Existalis, T. californica, Cotinus  
Myrmica, Prionyx parkeri, Musca, Sarcophaga

Vertebrates: TUVU VISH HOSP, MONO, Uta,

## Comments:

Need 1 hr, 50 min on area 3









**Delhi sands flower-loving fly - General Form**

Date 8/17/2017 Overall Time \_\_\_\_\_

Jobs Edison

Surveyor Jeremiah N. George Survey Partner(s) \_\_\_\_\_

Overall Mileage \_\_\_\_\_

**Weather:**

NOTE SURVEY window Bumped By 15 Per USFWS concultane letter.

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 10:15	40%	clear patchy <u>overcast</u> drizzle shower	2-3 mph	75°F
11:15	25%	clear patchy <u>overcast</u> drizzle shower	5 mph WSW	78°F
12:00	10	clear patchy <u>overcast</u> drizzle shower	5	84°F
Stop 13:09	0	<u>clear</u> patchy overcast drizzle shower	5-6 mph	88°F
14:00	0		6-7 mph	90°F

Haze  
moist  
layer  
brumy  
at

Site #	Time	Mileage on site
1	10:15 to 10:30	_____
3	10:38 to 12:51	_____
4	12:53 to 13:20	_____
2a	13:23 to 14:07	_____
2b	14:07 to 14:20	_____
	== to	_____
	== to	_____
	to	_____
	to	_____
	to	_____
	to	_____

**Biological elements:**

*Rhaphiomidas terminatus* ? NO time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_

Other arthropods (general) Bombyliids  Asilids   
 Mydids  Apiocerids \_\_\_\_\_ Sphecids   
 Pompillids  Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note Amphipila, Bombyx, microbeles, Red Dalgamitidae  
Pogo. not celi + villasp., Eufonia, see collection  
Nemomydas 1x ♂

**Comments:**

Amcken, + heterotheca, AT cal - single plant @ 2a.

**Vertebrates:**

Wa, western cottontail

Date Aug 20, 2017

Overall Time 3 hrs 56 min.

Jobs Edison

Surveyor Rick Rogers

Survey Partner(s) 0

Overall Mileage 47920 - 47925

Weather:

Time (24 hr)	% Cloud	Skv	Winds (mph)	Temp (F)
Start 10:00	0	clear patchy overcast drizzle shower	0-1	85
11:00	0	clear patchy overcast drizzle shower	0-2	90
12:00	0	clear patchy overcast drizzle shower	1-2	92
Stop 1:56	0	clear patchy overcast drizzle shower	2-3	95

Site #	Time	Mileage on site
<u>1</u>	<u>10:00 to 10:15</u>	<u>47920</u>
<u>3</u>	<u>10:25 to 12:29</u>	<u>47922</u>
<u>2a</u>	<u>12:32 to 1:17</u>	<u>47923</u>
<u>2b</u>	<u>1:17 to 1:25</u>	<u>47923</u>
<u>4</u>	<u>1:30 to 1:56</u>	<u>47925</u>
	to	
	to	
	to	
	to	
	to	
	to	
	to	

Biological elements:

*Rhaphiomidas terminatus* ? time sex numbers

110 molodiscid sp. Smbler, ferrinellid w. red dots  
 Trimerotropis californica Pantalla flavescens Geron sp. Euclyptus sp. Prionyx pariter  
 Other arthropods (general) Bombyliids  Asilids  Eucecyrtus femurrubrum,  
 Mallophaga Mydids  Apiocerids  Sphecids  Chrysids  Cotinus pygmaeus albescens  
 iduvix Pompillids  Scoliids  Chrysidids   
 Sceliphron Other insects of note Eristalis sp., Pimpla ruficornis, Anomala azteca, Tenebrio molitor  
 Neodiplocampa Stenopogon breviscolus, Neomeloides, Villa militator parvipes edwardsii  
 mirid Dasymutilla calif. ♀, Philanthus vertilebris P. multi-maculatus, Exoprosopa butleri  
 Paragus fibialis Phaeobis sennae papilio rotulus Trimerotropis fontana Strymen melinum



Date Aug 23, 2017 Overall Time 3 hrs. 56 min.

Jobs Edison

Surveyor Rick Rogers Survey Partner(s) 0

Overall Mileage 48367 - 48372

Weather:

Time (24 hr)	% Cloud	Sky					Winds (mph)	Temp (F)
Start 10:00	10	clear	patchy	overcast	drizzle	shower	1-4	80
11:00	10	clear	patchy	overcast	drizzle	shower	1-6	88
12:29	5	clear	patchy	overcast	drizzle	shower	1-5	89
Stop 1:56	0	clear	patchy	overcast	drizzle	shower	2-6	89

Site #	Time	Mileage on site
<u>1</u>	<u>10:00 to 10:15</u>	<u>48367</u>
<u>3</u>	<u>10:25 to 12:29</u>	<u>48369</u>
<u>2a</u>	<u>12:32 to 1:17</u>	<u>48370</u>
<u>2b</u>	<u>1:17 to 1:25</u>	<u>48370</u>
<u>4</u>	<u>1:30 to 1:56</u>	<u>48372</u>
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____

Biological elements:

*Rhaphiomidas terminatus*? \_\_\_\_\_ time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_

*Trioxys lacerata* *Amphophila azteca*  
 Other arthropods (general)  Bombyliids  Asilids  *Sinea* sp., *Strymon molinus*  
*Plebejus acinor*  Mydids  Apiocerids \_\_\_\_\_  Sphecids  *Euclyptus* sp., *Pantalla flavescens*  
 Pompillids \_\_\_\_\_  Scoliids \_\_\_\_\_  Chrysidids  *Trimerotropis californi*  
 Other insects of note *Stenopogon brevifolius*, *Amphophila aberti*, *Bombix comata*,  
*Eristalinus aeneus*, *Chrysochloris* sp., *Dasymutilla californica*, *Ozzelius* sp., *Cotinus*,  
*H. phylaeus*, *Nemomydas*, *Exoprosopa butleri*, *Cynthia cavilui*, *Pieris protodice*, *Thyridanthrax*  
*Trimerotropis patidipennis*, *Villa molitor*, *Prionyx paricari*, *Villa lateralis*, *Anax junius*, *Lebulilla saturata*



## Delhi sands flower-loving fly - General Form

Date 27 Aug 2017 Overall Time \_\_\_\_\_ Jobs EDISONSurveyor DAVID K. FAULKNER Survey Partner(s) ∅

Overall Mileage \_\_\_\_\_

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1000	10%	clear <u>patchy</u> overcast drizzle shower	∅	80°
1105	>5% HAZE	clear <u>patchy</u> overcast drizzle shower	0-1	88°
1300	∅ HAZE	<u>clear</u> patchy overcast drizzle shower	5-6	99°
Stop 1400	∅ HAZE	<u>clear</u> patchy overcast drizzle shower	3-4	102°

Site #	Time	Mileage on site
<u>EDISON 1</u>	<u>1000</u> to <u>1015</u>	<u>199189</u>
<u>EDISON 2A</u>	<u>1017</u> to <u>1104</u>	<u>199192</u>
<u>EDISON 2B</u>	<u>1105</u> to <u>1113</u>	<u>199192</u>
<u>EDISON 3</u>	<u>1115</u> to <u>1330</u>	<u>199193</u>
<u>EDISON 4</u>	<u>1334</u> to <u>1400</u>	<u>199194</u>
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____

## Biological elements:

*Rhaphiomidas terminatus* ? \_\_\_\_\_ time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_Other arthropods (general) Bombyliids  Asilids  (one)Mydids  Apiocerids  Sphecids Pompillids  Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note:

E-1: Just about everything, Dragonflies, Med Fly, Dasyneutellid (♂)E-2 & 6: Not much, Brachymenurus, Syrphids.E-3: Brachymenurus (2 species), M. Col. formicus, Mydids, Apiocera (1♂), grasshoppers, AdultE-4: Syrphids, Bombyliids, Asilid

Comments:

E-1: Looks like the western part of the site was sprayed within the last 2 months with a herbicide. Area across from the rice pool lotsE-4: Part of the site was tilled

Vertebrates:

E-3: SWALLOWS

Date Aug 30, 2017 Overall Time 3 hrs. 56 min.

Jobs Edison

Surveyor Rick Rogers Survey Partner(s) 0

Overall Mileage 49241-49247

**Weather:**

Time (24 hr)	% Cloud	clear	patchy	overcast	drizzle	shower	Winds (mph)	Temp (F)
Start 10:00	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0-0	91
11:16	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1-3	103
12:32	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2-3	105
Stop 1:56	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2-5	106

Site #	Time	Mileage on site
<u>1</u>	<u>10:00</u> <del>49241</del> to <u>10:15</u>	<u>49241</u>
<u>3</u>	<u>10:25</u> to <u>12:29</u>	<u>49244</u>
<u>2a</u>	<u>12:32</u> to <u>1:17</u>	<u>49245</u>
<u>2b</u>	<u>1:17</u> to <u>1:25</u>	<u>49245</u>
<u>4</u>	<u>1:30</u> to <u>1:56</u>	<u>49247</u>
	to	
	to	
	to	
	to	
	to	
	to	
	to	

**Biological elements:**

*Rhaphiomidas terminatus*? \_\_\_\_\_ time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_.

*Podoplaea campida* *Phaobis azarha*, *Precis coenia*, *H. phylaxus*, *Plebejus acmon*, membracid  
*Trimerotropis* *Colpomanicus*, *Eucercens femurrubron*, *Orybellurpictus*, *Chrostocerca niteus* green w  
 Other arthropods (general) Bombyliids  Asilids  *E. acraea* *Chlorochroa* sp. *Misogasterii*  
*Chilantellus* Mydids  Apiocerids  Sphecids  *Amnophila adenti* *Stroykon*  
*Mutillidae* Pompillids  Scoliids  Chrysidids  *Amnophila* *melinus*  
*Fenopogon* Other insects of note *Colige eumylone*, *Pierisprotostice*, *Cyathocardia*, *Pyrgus*  
*Breviculus* *albescens*, *Villa inditor*, *Amnophila azteca*, *Aspictizennis*, *Dembix csmata*  
*Pisyrone* *Dyrudella picta*, *Sceliphron*, *Homolodisca*, *Poliistes apachus*, *Melanopiles* sp.  
*Scutelleridae* *Muremys* sp. *aff. - elliptica*, *Melichroa*, *Pernon* *atavus*



## Delhi sands flower-loving fly – General Field Form

Date 9/2/17 Overall Time 1005 - 2000 Job Edison  
 Surveyor K.A. Osborne Survey Partner(s) /  
 Mileage 3559 - 3566

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start <u>1005</u>	<u>1</u>	<u>clear</u> patchy overcast drizzle shower	<u>0</u>	<u>99</u>
<u>1204</u>	<u>5</u>	<u>clear</u> patchy overcast drizzle shower	<u>4-7</u>	<u>109</u>
		clear patchy overcast drizzle shower		
Stop <u>2000</u>	<u>10</u>	<u>clear</u> patchy overcast drizzle shower	<u>0-5</u>	<u>105</u>

## Biological elements:

*Rhaphiomidas terminatus*? \_\_\_\_\_ time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_

Other arthropods (general) Bombyliids / Asilids /  
 Mydids \_\_\_\_\_ Apiocerids \_\_\_\_\_ Sphecids \_\_\_\_\_  
 Pompillids \_\_\_\_\_ Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note 1: Cutina, Bombyx, Colias, Pontia, Braconidae, Argus, Anax, Apanteles, Vc. Hylephila, Ammophila 3: Vc. T. californica, Braconidae, Stenomacrus, Bombyx, Stenopogon b., V. molitor, Priomya, Ammophila azteca, Ammophila aberti, Sc. histocerca, Iris, Laroclea, P. rutulus, Zaf. Musca, vane Asilid!

Vertebrates: \_\_\_\_\_

## Comments:

Site #	Time	to	Mileage to site
<u>1</u>	<u>1005</u>	<u>1020</u>	<u>3559</u>
<u>3</u>	<u>1025</u>	<u>1240</u>	<u>3561</u>
<u>2b</u>	<u>1241</u>	<u>1249</u>	<u>3563</u>
<u>2a</u>	<u>1249</u>	<u>133</u>	<u>3563-4</u>
<u>4</u>	<u>136</u>	<u>2000</u>	<u>3566</u>





Date Sept 5, 2017 Overall Time 3 hrs. 56 min.

Jobs Edison

Surveyor Rick Rogers Survey Partner(s) 0

Overall Mileage 50088 - 50094

Weather:

Time (24 hr)	% Cloud	Sky				Winds (mph)	Temp (F)	
Start 10:00	5	clear	patchy	overcast	drizzle	shower	0-1	83
11:30	5	clear	patchy	overcast	drizzle	shower	0-2	90
12:30	10	clear	patchy	overcast	drizzle	shower	0-1	90
Stop 1:56	40	clear	patchy	overcast	drizzle	shower	1-10	98

Site #	Time	Mileage on site
<u>1</u>	<u>10:00 to 10:15</u>	<u>50088</u>
<u>3</u>	<u>10:25 to 12:29</u>	<u>50091</u>
<u>2d</u>	<u>12:32 to 1:17</u>	<u>50092</u>
<u>2b</u>	<u>1:17 to 1:25</u>	<u>50092</u>
<u>4</u>	<u>1:30 to 1:56</u>	<u>50094</u>
	to	
	to	
	to	
	to	
	to	
	to	
	to	
	to	

Biological elements:

*Rhaphiomidas terminatus*? time sex numbers

Chalcidid smy with white spots on <sup>thorax</sup> legs  
*Ammophila aberti*  
 Zerod sp.  
 Strymon melinus  
*B. exilis*  
*Pisyrion* sp. (sm. blk.)  
 Amberwing  
*Draconella*  
*Exoprosopa butteri*, *Nemomydas pantherinus*, *Ammophila azteca*, *Phitanthus multimac.*  
 Other arthropods (general) Bombyliids  Asilids   
 Mydids  Apterocerids  Sphecids   
 Pompillids  Scoliids  Chrysidids   
 Other insects of note *Efferia albibarbis*, *Pieris protodice*, *Anax junius*, *Aschinea prians*  
*multicolor*, *Bombix comata*, *Colias eurhythmus*, *Cyathia cardui*, *Eristalis* sp., *Thoma*  
*Sceliphron*, *Villa molitor*, *Lordus* sp., *Brachyleomyrma* sp. (lg.) *Eucerceris*  
*femurubrum*, *Chlorochroa* sp., *melanoplus* sp., *Dasymutilla californica*, *Zelus* sp.  
*scutelleridae* (brown)  
*Dzodiceromyia* sp.  
*Melessodos* sp. (sm. brown)  
*Dyrubella picta*  
*Steuropogon brevisculus*  
*Trimerotropis californi*



**Delhi sands flower-loving fly - General Form**

Date <sup>Sept</sup> 9/9/2017 Overall Time \_\_\_\_\_

Jobs SCE

Surveyor Jeremiah George Survey Partner(s) \_\_\_\_\_

Overall Mileage \_\_\_\_\_

**Weather:**

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 10	50%	clear (patchy) overcast drizzle shower	4	73 °F
11	hazy	clear (patchy) overcast drizzle shower	7	77 °F
12	65%	clear (patchy) overcast drizzle shower	10	82 °F
Stop 13	60%	clear (patchy) overcast drizzle shower	12	85 °F

Site #	Time	Mileage on site
1	10:10 to 10:30	
3	10:35 to 12:50	
4	12:55 to 13:20	
2a	13:24 to 14:00	
2b	14:07 to 14:20	
	to	
	to	
	to	
	to	
	to	
	to	
	to	

*same within protocol with survey window extension*

**Biological elements:**

*Rhaphiomidas terminatus*? NO time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_

Other arthropods (general) Bombyliids  Asilids   
 Mydids \_\_\_\_\_ Apicerids \_\_\_\_\_ Sphecids   
 Pompillids  Scoliids  Chrysidids \_\_\_\_\_

Other insects of note small Asilid check ID  
Amomyia peeps on Baccharis bloom, Valicella, Villa major  
Agapostemon, Tachysphex, \_\_\_\_\_

**Comments:**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Vertebrates:**

VTA / Colletes / GSP



## Delhi sands flower-loving fly - General Form

Date 11 Sept 2017 Overall Time \_\_\_\_\_Jobs EDISON SITESSurveyor DAVID K FAULKNER Survey Partner(s) Ø

Overall Mileage \_\_\_\_\_

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1000	50%	clear <u>patchy</u> overcast drizzle shower	0-1	80°
1100	80%	clear <u>patchy</u> overcast drizzle shower	1-2	86°
1230	50%	clear <u>patchy</u> overcast drizzle shower	3-4	91°
Stop 1400	60%	clear <u>patchy</u> overcast drizzle shower	3-4	91°

Site #	Time	Mileage on site
<u>EDISON 1</u>	<u>1000</u> to <u>1015</u>	<u>200653</u>
<u>EDISON 2a</u>	<u>1017</u> to <u>1104</u>	<u>200655</u>
<u>EDISON 2b</u>	<u>1105</u> to <u>1113</u>	<u>200655</u>
<u>EDISON 3</u>	<u>1115</u> to <u>1330</u>	<u>200656</u>
<u>EDISON 4</u>	<u>1334</u> to <u>1400</u>	<u>200657</u>
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____
_____	_____ to _____	_____

## Biological elements:

*Rhaphiomidas terminatus*? \_\_\_\_\_ time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_Other arthropods (general) Bombyliids  Asilids Mydids \_\_\_\_\_ Apiocerids \_\_\_\_\_ Sphecids 

Pompillids \_\_\_\_\_ Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note: ED-1: Conopid, Valucella (type) Dasynura (sp. red), Bombyliid (micro), BantiaED-2a/b: Grasshopper, V. concolorED-3: Mymeleon californicus, Brachymerus sp. (Z), Potter flies (honey sp) Bantia  
Bombyliids, Edwards BlueED-4: (Ø nothing new).

Comments:

Vertebrates:

## Delhi sands flower-loving fly - General Form

Date 16 Sept 2017 Overall Time 4 hrs (1000-1400) Jobs EDISON SITESSurveyor DAVID K FAULKNER Survey Partner(s) Ø

Overall Mileage \_\_\_\_\_

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start 1000	100%	clear patchy <u>overcast</u> drizzle shower	0-1	72°
1100	80%	clear <u>patchy</u> overcast drizzle shower	0-1	73°
1200	50%	clear <u>patchy</u> overcast drizzle shower	1-2	78°
Stop 1400	40%	clear <u>patchy</u> overcast drizzle shower	3-4	79°

Site #	Time	Mileage on site
<u>ED-1</u>	<u>1000</u> to <u>1015</u>	<u>201321</u>
<u>ED-2a</u>	<u>1017</u> to <u>1104</u>	<u>201323</u>
<u>ED-2b</u>	<u>1105</u> to <u>1113</u>	<u>201323</u>
<u>ED-3</u>	<u>1115</u> to <u>1330</u>	<u>201324</u>
<u>ED-4</u>	<u>1334</u> to <u>1400</u>	<u>201325</u>
	to	
	to	
	to	
	to	
	to	
	to	
	to	

## Biological elements:

*Rhaphiomidas terminatus*? \_\_\_\_\_ time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_Other arthropods (general) Bombyliids  Asilids Mydids \_\_\_\_\_ Apicerids \_\_\_\_\_ Sphecids 

Pompillids \_\_\_\_\_ Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note: ED-1: Prionomyia, Ammophila, Muddaubs, BombyliidsED-2a: Asilids (brown), Syrphids ED-2b: ØED-3: ENTIRE SITE HAS BEEN MOWED SINCE LAST VISIT ØED-4: Syrphids, Halictids (green), Mantid (♂)

## Comments:

ED-3: Mowed

## Vertebrates:

ED-3: 8 Turkey Vultures



## Delhi sands flower-loving fly - General Form

Date 9/18/2017 Overall Time 10<sup>00</sup> - 2<sup>00</sup> Jobs EdisonSurveyor K.A Osborne Survey Partner(s) [Signature]Overall Mileage 4334 - 4339

## Weather:

Time (24 hr)	% Cloud	Sky	Winds (mph)	Temp (F)
Start <u>10<sup>00</sup></u>	<u>1</u>	<u>clear</u> patchy overcast drizzle shower	<u>0</u>	<u>78</u>
<u>10<sup>53</sup></u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>6-3</u>	<u>74</u>
<u>12<sup>15</sup></u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>2-3</u>	<u>78</u>
Stop <u>2<sup>00</sup></u>	<u>0</u>	<u>clear</u> patchy overcast drizzle shower	<u>0-4</u>	<u>81</u>

Site #	Time	Mileage on site
<u>4</u>	<u>10<sup>00</sup></u> to <u>10<sup>28</sup></u>	<u>4334</u>
<u>3</u>	<u>10<sup>28</sup></u> to <u>12<sup>43</sup></u>	<u>4335</u>
<u>26</u>	<u>12<sup>44</sup></u> to <u>12<sup>52</sup></u>	<u>4336</u>
<u>29</u>	<u>12<sup>52</sup></u> to <u>1<sup>36</sup></u>	<u>4336</u>
<u>1</u>	<u>1<sup>43</sup></u> to <u>2<sup>00</sup></u>	<u>4339</u>
	to	
	to	
	to	
	to	
	to	
	to	
	to	

## Biological elements:

*Rhaphiomidas terminatus* ? time \_\_\_\_\_ sex \_\_\_\_\_ numbers \_\_\_\_\_Other arthropods (general) Bombyliids  Asilids   
Mydids \_\_\_\_\_ Apiocerids \_\_\_\_\_ Sphecids   
Pompillids \_\_\_\_\_ Scoliids \_\_\_\_\_ Chrysidids \_\_\_\_\_

Other insects of note \_\_\_\_\_

4: Braconidinae, Uc., Hylaphila, Anax, Nectus, Pantella f., Stratiomyid Juan.  
Bombus cristalis, Crisalis s/w, Hems, 3: Anax, Myrmecodia, Mutillid.  
Stenopogon, Bombus, Cotinus Colias, Vs. Pantella f. Anax, Hems, Ammophila  
26: Pantella f., Anax, T. californica Cotinus, Sympetrum, Uroca,

Comments:

Site 3: All unusual => dead rabbits attract urine and RIBTQ  
29: ANAXE, 29: Anax, Cotinus, Uc., Libellula, Erythrocnemis Ammophila a 2 fecs. Antheromyia  
Bombus sumra, Xylacopa, Pantella f. Nectus fly, Sarcophagid, Bombus.  
1: Agraulis, Uc. Colias, Stenopogon, Braconidinae Hylaphila Anax, Antheromyia Elysius Macropus  
Pipit  
 Vertebrates: 4: SARKA, Uta, 3: TUUU, AMCK, KBLTA Uta Cottontail SARKA EUDO  
CAKI, 26 Cottontail TUUU/29: ANAXE



	KHO	RR	ER	DF	JG
1-Jul					Edison
5-Jul				Edison	
9-Jul			Edison		
12-Jul		Edison			
17-Jul		Edison			
21-Jul					Edison
24-Jul				Edison 1, 2a, 3	
25-Jul			Edison 2b, 4		
28-Jul		Edison			
30-Jul				Edison	
2-Aug		Edison			
4-Aug	Edison in error day early	<i>— write new data from!</i>			
5-Aug	Edison (minus 2 hr area 3)				
6-Aug	Edison area 3				
9-Aug		Edison			
13-Aug		Edison			
17-Aug					Edison
20-Aug		Edison			
23-Aug		Edison			
27-Aug				Edison	
30-Aug		Edison			
2-Sep	Edison				
3-Sep	Edison 4 part				
5-Sep		Edison			
9-Sep					Edison
11-Sep				Edison	
16-Sep				Edison	
18-Sep	Edison				