

**ACACIA AND RANDALL AVENUES
NORTH PROJECT SITE
(APN Numbers 0131-131-13 & 0131-131-14)**

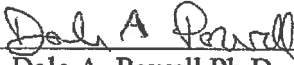
**Focused Survey for the
Delhi Sands Flower-loving Fly**

Prepared for:

Michael Ramirez
Verde Vistas
P.O. BOX 245
Monterey Park, CA 91754
(760) 810-8548
verdevistas@aol.com

Prepared by:

Powell Environmental Consultants
146 West Broadbent Drive
Riverside, CA 92507
Phone/FAX (951) 686-1497
Cellular Phone (951) 440-4235
dajrpowell@msn.com


Dale A. Powell Ph.D.
TE-006559-7

October 2, 2018

ACACIA AND RANDALL AVENUES NORTH PROJECT SITE

Focused Survey for the Delhi Sands Flower-loving Fly

October 2, 2018

Introduction

This report presents the results of a focused survey for the Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) on a 5-acre site located in the City of Rialto, San Bernardino County. This property is under consideration for residential development in the future. The County of San Bernardino and the U.S. Fish and Wildlife Service require that focused surveys be conducted to determine whether this proposed development would impact this federally endangered insect. This survey, conducted by Powell Environmental Consulting, resulted in negative findings. Previous surveys were conducted by Powell Environmental Consultants upon the site in 2004, 2005, 2014, 2015, 2016, and 2017. Those surveys also resulted in negative findings.

Site Description

The approximately 5-acre site is located near the city of Rialto, on a portion of the northwest central area of Section 13, Township 1 South, Range 5 West; San Bernardino Baseline and Meridian; USGS 7.5' San Bernardino South Quad (See Maps 1 & 2). It is rectangular in outline. The site sits on the east side of Acacia Avenue, a few hundred feet north of Randall Avenue (APN Numbers 0131-131-13 & 0131-131-14). The site is relatively flat and its elevation is approximately 1,165 feet above sea level. Adjacent to the north and to the east of the site are houses. South of the southeastern area of the site is a poultry farm and houses lie south of the southeastern area of the site. Across Acacia Avenue, to the west, are houses.

According to a soil map (U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of San Bernardino County Southwestern Part, California, 1980.), the site possesses Delhi Fine Sand (Db). The Delhi fine sands is a "nearly level to strongly sloping soil on alluvial fans that have been reworked by wind action." (U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of San Bernardino County Southwestern Part, California, 1980.). Based upon my field examination I generally concur with the soil map.

Most of the site is covered by exposed Delhi sands. There is very little vegetation growing upon the site – under 5% of the soil was covered by vegetation.

The most abundant plant observed growing upon the site was Bermuda grass (*Cynodon dactylon*). Of the Delhi Sands Flower-loving Fly "indicator" plants only a small number of California crotons (*Croton californicus*) and telegraph weeds (*Heterotheca grandiflora*) were observed growing along the western edge of the site and annual bursages (*Ambrosia*

acanthicarpa) were observed growing in the center of the site. Disturbances observed on the site include disking, the invasion of non-native plant and animal species, and minor trash dumping.

Delhi Sands Flower-loving Fly Background Information

The Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) (family Mydidae) was listed as an endangered species under the Endangered Species Act, as amended on September 23, 1993. The California Natural Diversity Data Base lists the DSFLF rank as being: G1T1S1 - Federally listed as being extremely endangered (G1); found only in California (T1); and as being extremely endangered in California (S1).

The Delhi Sands Flower-loving Fly is considered to be endangered primarily because of the loss of its habitat, mainly due to the habitat's conversion to agricultural, residential, and industrial uses. Its historic range has been reduced by over approximately 97% (USFWS, 1993). The fly is known only to inhabit areas where Delhi series soils are located. These soils consist of fine, sandy soils, often forming wholly or partially consolidated dunes, located in an irregular 40 square mile area, in southwestern San Bernardino and northwestern Riverside Counties (Soil Conservation Service, 1980).

Fine unconsolidated soils are required for oviposition. The female fly inserts the end of her abdomen deep into the soil to lay her eggs (Rogers and Mattoni, 1993). The life history of the larval stages are unknown, however, it is presumed, that the larvae develop underground (Greg Ballmer, D. Hawks, pers. comm.). The Delhi Sands Flower-loving Fly's adult flight period lasts approximately six weeks from late June through mid-September. The adult is approximately 1 inch long, tan to orange-brown in color, with dark brown bands and spots upon its abdomen. Its wings are hyaline. It has large green eyes and a long slender proboscis, which it has been seen to use to feed upon nectar from California buckwheat and telegraph weed. The adults frequent open areas, usually near unconsolidated soil. The adult males patrol open areas looking for females to mate with. The females are more sedentary and perch upon plants or sit upon the ground for long periods. Adults are most often observed from 9 or 10 AM until 3 or 4 PM.

The DSFLF is frequently associated with certain plants: California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), annual bursage (*Ambrosia acanthicarpa*), and telegraph weed (*Heterotheca grandiflora*), are sometimes called "indicator plants". Other native plant species also occur in DSFLF habitat: California evening primrose (*Oenothera californica*), deerweed (*Lotus scoparius*), lessinga (*Lessingia glandulifera*), rancher's fiddleneck (*Amsinckia menziesii*), sapphire woolly-star (*Eriastrum sapphirinum*), and Thurber's buckwheat (*Eriogonum thurberi*)

Delhi Sands Flower-loving Fly Recovery Plan

In 1997 the U.S. Fish and Wildlife Service issued the final recovery plan for the Delhi Sands Flower-loving Fly (USFWS, 1997). The plan establishes three recovery units: the Colton, Jurupa, and Ontario Recovery Units. The Colton Recovery Unit contains the most known habitat, followed by the Jurupa Recovery Unit. Of the three recovery units, the Ontario Recovery Unit contains the least suitable habitat. Most of the Ontario Recovery Unit's habitat has been

degraded by long-term agricultural use and much of the remainder of “suitable” habitat is highly fragmented and is in very close proximity to residential, commercial, or industrial development. While the fly is known to occur in the Ontario Recovery Unit, the possibility of using the Ontario Recovery Unit to protect the Delhi Sands Flower-loving Fly is limited because of its prior history and fragmented nature.

The Acacia and Randall Avenues Project site is located within the Colton Recovery Unit.

Methods

Prior to the initiation of the focused survey, the Carlsbad Field Office of the USFWS was notified on June 28, 2018 of Powell Environmental Consultant’s intent to perform the survey. This focused survey was initiated on July 2, 2018 and continued with biweekly site surveys until September 19, 2018. All field surveys and activities associated with this study were conducted in accordance with the Interim General Guidelines for the Delhi Sands Flower-loving Fly and conditions set forth in the surveyors 10(a)(1)(A) permits. Surveys were conducted by entomologist Dale Powell PhD and Jun Powell (authorized under permit TE-006559-7). Survey dates and times, ambient air temperatures, wind speed, general weather conditions, insect families/species detected, and other pertinent field data were recorded on field survey forms and are included in Table 1 and in the Appendices.

Results and Discussion

No Delhi Sands Flower-loving Flies were observed on the project site during the focused survey. The closest known observation of the fly in Rialto was approximately 0.1 miles west of this site. No member of the family Mydidae was observed on the project site. Other species of the closely related families Asilidae and Apioceridae, which are associated with Delhi sands, were observed upon the site. These insects are frequently associated with the Delhi Sands Flower-loving Fly and can be considered indicators that the site may have potential as suitable fly habitat, even though the site has been altered by various disturbances. The total numbers of all insect fauna observed upon the site was lower than during the 2004, 2005, 2014, 2015, 2016, or 2017 survey seasons. The site had been cleared of vegetation earlier in the year, before the survey season began, and very few plants were observed growing upon the site. A small number of the Delhi Sands Flower-loving Fly “indicator” plants, California croton (*Croton californicus*), telegraph weed (*Heterotheca grandiflora*), and annual bur-ages (*Ambrosia acanthicarpa*) were observed growing upon the site.

Delhi Sands Flower-loving Fly Survey Results

Date	Time	Minutes Surveyed	Weather (at start)	Temp (°F)	Wind (mph) aver*/max
7/2/18 ²	12:35-13:00	25	Clear	86°	3/7
7/5/18 ¹	13:00-13:30	30	Clear	98°	4/7
7/9/18 ¹	12:45-13:15	30	Clear	101°	4/8
7/11/18 ²	13:00-13:25	25	Partly Cloudy	94°	4/8
7/16/18 ¹	14:10-14:35	25	Clear	97°	3/6
7/19/18 ²	13:45-14:05	20	Clear	101°	3/5
7/23/18 ²	11:45-12:15	30	Clear	96°	3/5
7/26/18 ²	11:20-11:50	30	Clear	88°	1/3
7/30/18 ²	11:45-12:15	30	30% Clouds	95°	3/5
8/1/18 ²	11:30-12:00	30	Clear	89°	2/4
8/6/18 ²	12:15-12:45	30	Clear	99°	2/4
8/8/18 ²	12:25-12:50	25	Haze	95°	2/4
8/13/18 ²	12:00-12:35	35	Clear	87°	3/5
8/15/18 ²	11:55-12:30	35	Clear	89°	3/7
8/20/18 ¹	12:20-12:55	35	Clear	89°	3/5
8/22/18 ¹	12:10-12:35	25	Clear	86°	3/5
8/27/18 ²	11:35-12:35	60	Clear	78°	3/6
8/29/18 ²	10:15-10:45	30	50% Clouds	79°	0/1
9/3/18 ¹	12:25-12:50	25	Clear	82°	3/5
9/5/18 ¹	12:10-12:35	25	Clear	81°	4/6
9/10/18 ¹	12:15-12:35	20	Clear	88°	2/4
9/12/18 ¹	12:25-12:45	20	Clear	80°	2/4
9/17/18 ¹	12:20-12:45	25	Clear	83°	3/6
9/19/18 ²	10:15-10:45	30	Clear	72°	0/1

¹ Dale Powell

² Jun Powell

³ Dale and Jun Powell

* Over a 20 second period.

REFERENCES

- Emmel, T.C. and J.F. Emmel. 1973. The Butterflies of Southern California. Natural History Museum of Los Angeles. Science Series 26: 1-148.
- Hickman, J.C. (editor). 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, California. 1400 pp.
- Rogers, R. and M. Mattoni. 1993. Observations on the natural history and conservation biology of the giant flower loving flies, *Rhaphiomidas* (Diptera: Apioceridae). Dipterological Research 4(1-2): 21-34.
- Scott, S. (editor). 1999. Field Guide to the Birds of North America. Third Edition. National Geographic Society, Washington D.C. 480 pp.
- U.S. Department of Agriculture, Soil Conservation Service, 1971. Soil Survey of Western Riverside Area, California. U.S. Gov. Printing Office, Washington D.C. 188 pp.
- U.S. Department of Agriculture, Soil Conservation Service, 1980. Soil Survey of San Bernardino County Southwestern Part, California. U.S. Gov. Printing Office, Washington D.C.
- U.S. Fish and Wildlife Service. 1997. Final Recovery Plan for the Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*). U.S. Fish and Wildlife Service, Portland, OR. 51 pp.

APPENDIX

SUBCONTRACTOR CONCURRENCE

I, Dale A. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Acacia and Randall Avenues North Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

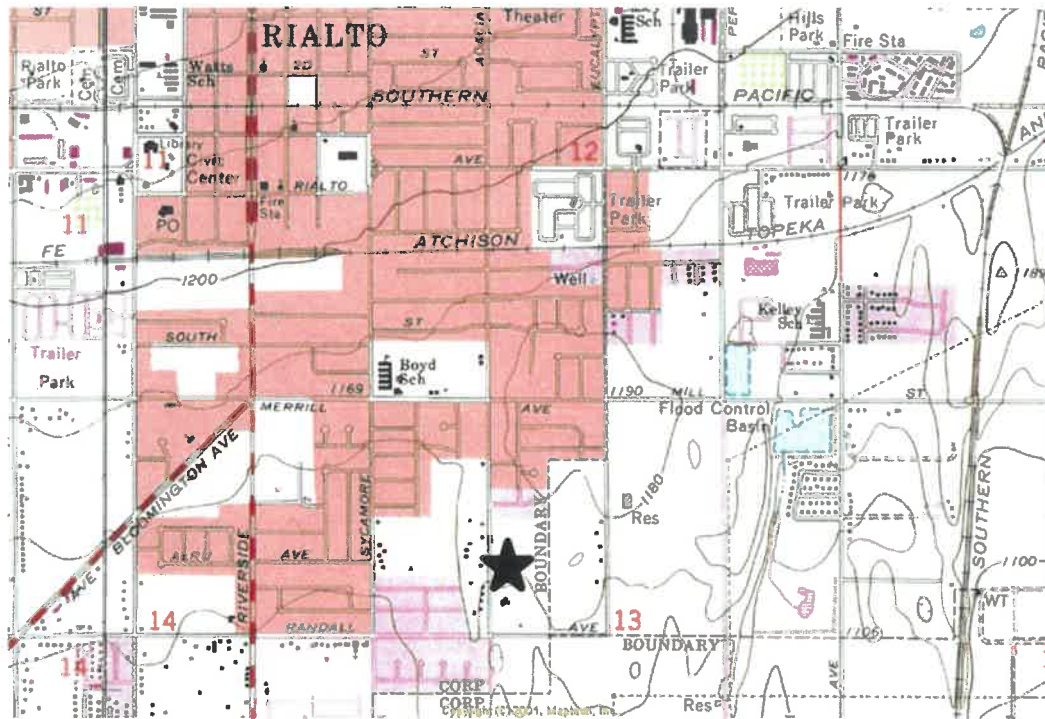
Dale A Powell 10/2/2018
SIGNATURE DATE

I, Jun R. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Acacia and Randall Avenues North site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

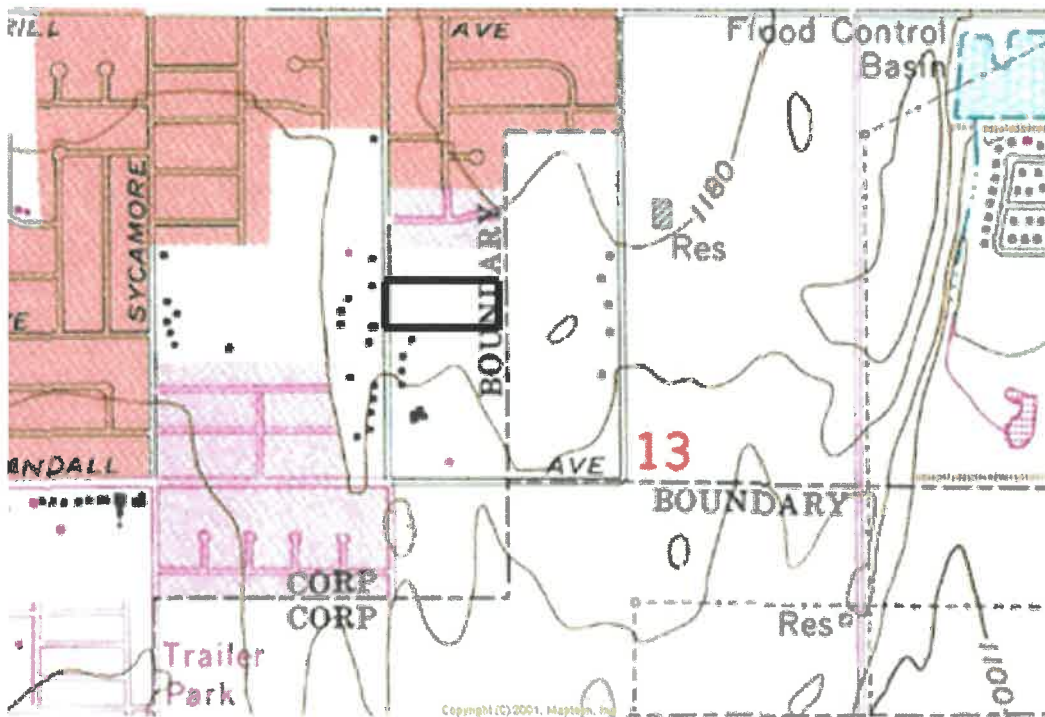
Jun R. Powell 10/2/2018
SIGNATURE DATE

APPENDIX

Map 1. General location of the Acacia and Randall Avenues North Project.



Map 2. Location of the Acacia and Randall Avenues North Project site.



ACACIA AND RANDALL AVENUES NORTH PROJECT SITE

Picture 1. Overview of the site facing east from the northwestern corner.



Picture 2. Overview of the site facing southeast from the northwestern corner.



ACACIA AND RANDALL AVENUES NORTH PROJECT SITE

Picture 3. Overview of the site facing south from the northwestern corner.



FIELD NOTES

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: Accacia North

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
7/12/12	Temp					86°		
Week	Wind					3/7		
1	Weath					Clear		
7/15	Temp					99°		
Week	Wind					4/7		
1	Weath					Clear		
7/19	Temp					101°		
Week	Wind					4/9		
2	Weath					clear		
7/11	Temp					94°		
Week	Wind					4/8		
2	Weath					PC		
7/16	Temp						97°	
Week	Wind						3/6	
3	Weath						Clear	
7/19	Temp						101°	
Week	Wind						3/5	
3	Weath						clear	
7/23	Temp				96°			
Week	Wind				3/5			
4	Weath				clear			
7/26	Temp			88°				
Week	Wind			1/3				
4	Weath			clear				
7/20	Temp				95°			
Week	Wind				3/5			
5	Weath				36° cloud			
8/1	Temp		89°					
Week	Wind		2/4					
5	Weath		clear					
8/6	Temp				94°			
Week	Wind				2/4			
6	Weath				Clear			
8/8	Temp				95°			
Week	Wind				2/4			
6	Weath				Heat			
8/13	Temp				79°			
Week	Wind				3/5			
7	Weath				Clear			

Wind: First number is average (20 seconds) / second number is maximum.

Summers F. 11

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: Acacia North

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
8/15/9	Temp				89°			
Week	Wind				3/7			
7	Weath				Clear			
8/20	Temp				89°			
Week	Wind				3/5			
8	Weath				Clear			
8/22	Temp				76°			
Week	Wind				3/5			
8	Weath				Clear			
8/27	Temp				78°			
Week	Wind				3/6			
9	Weath				Clear			
8/29	Temp		79°					
Week	Wind		0/1					
9	Weath		Sh. Cloud					
9/3	Temp				72°			
Week	Wind				3/5			
10	Weath				Clear			
9/5	Temp				70°			
Week	Wind				4/6			
10	Weath				Clear			
9/10	Temp				88°			
Week	Wind				2/4			
11	Weath				Clear			
9/12	Temp				80°			
Week	Wind				2/4			
11	Weath				Clear			
9/17	Temp				72°			
Week	Wind				3/6			
12	Weath				Clear			
9/19	Temp		77°					
Week	Wind		0/1					
12	Weath		Clear					
	Temp							
Week	Wind							
	Weath							
	Temp							
Week	Wind							
	Weath							

Wind: First number is average (20 seconds) / second number is maximum.

Delhi Sands Flower-loving Fly Dale and Jun Rong Powell

Dale and Jun Rong Powell

[illegible]

Delhi Sands Flower-loving Fly Dale and Jun Rong Powell

Dale and Jun Rong Powell

[illegible]

lower-flying Fly

Dale and Jan KONG TOWEN

[illegible]

**ACACIA AND RANDALL AVENUES
POULTRY PROJECT SITE
(APN Number 0131-131-23)**

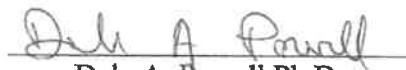
**Focused Survey for the
Delhi Sands Flower-loving Fly**

Prepared for:

Michael Ramirez
Verde Vistas
P.O. BOX 245
Monterey Park, CA 91754
(760) 810-8548
verdevistas@aol.com

Prepared by:

Powell Environmental Consultants
146 West Broadbent Drive
Riverside, CA 92507
Phone/FAX (951) 686-1497
Cellular Phone (951) 440-4235
dajrpowell@msn.com


Dale A. Powell Ph.D.
TE-006559-7

October 2, 2018

ACACIA AND RANDALL AVENUES POULTRY PROJECT SITE

Focused Survey for the Delhi Sands Flower-loving Fly

October 2, 2018

Introduction

This report presents the results of a focused survey for the Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) on a 3.89-acre site located in the City of Rialto, San Bernardino County. This property is under consideration for residential development in the future. The County of San Bernardino and the U.S. Fish and Wildlife Service require that focused surveys be conducted to determine whether this proposed development would impact this federally endangered insect. This survey, conducted by Powell Environmental Consulting, resulted in negative results. The site was also surveyed in 2017 by Powell Environmental Consultants with negative results.

Site Description

The 3.89-acre site is located near the city of Rialto, on a portion of the northwest central area of Section 13, Township 1 South, Range 5 West; San Bernardino Baseline and Meridian; USGS 7.5' San Bernardino South Quad (See Maps 1 & 2). It is rectangular in outline. The site sits on the east side of Acacia Avenue, a few hundred feet north of Randall Avenue (APN Number 0131-131-23). The site is relatively flat and its elevation is approximately 1,165 feet above sea level. Adjacent to the north of the site is an open field. To the east of the site are houses. South of the southeastern area of the site is an open field and houses lie south of the southeastern area of the site. Across Acacia Avenue, to the west, are houses. In the eastern portion of the site are poultry houses. In the center of the site is a residential house and buildings with a grassy area to the west with trees and ornamentals growing upon it.

According to a soil map (U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of San Bernardino County Southwestern Part, California, 1980.), the site possesses Delhi Fine Sand (Db). The Delhi fine sands is a "nearly level to strongly sloping soil on alluvial fans that have been reworked by wind action." (U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of San Bernardino County Southwestern Part, California, 1980.). Based upon my field examination I generally concur with the soil map.

There are large areas of open Delhi sands scattered throughout the project site around the buildings. There is very little native vegetation growing upon the site.

The most abundant plant observed growing upon the site was Bermuda grass (*Cynodon dactylon*) and introduced trees, shrubs, and other ornamentals. Of the Delhi Sands Flower-loving Fly "indicator" plants only a small number of California croton (*Croton californicus*) and telegraph

weeds (*Heterotheca grandiflora*) were observed. Disturbances observed on the site include the invasion of non-native plant and animal species, pedestrian and motor vehicle traffic, and minor trash dumping.

Delhi Sands Flower-loving Fly Background Information

The Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) (family Mydidae) was listed as an endangered species under the Endangered Species Act, as amended on September 23, 1993. The California Natural Diversity Data Base lists the DSFLF rank as being: G1T1S1 - Federally listed as being extremely endangered (G1); found only in California (T1); and as being extremely endangered in California (S1).

The Delhi Sands Flower-loving Fly is considered to be endangered primarily because of the loss of its habitat, mainly due to the habitat's conversion to agricultural, residential, and industrial uses. Its historic range has been reduced by over approximately 97% (USFWS, 1993). The fly is known only to inhabit areas where Delhi series soils are located. These soils consist of fine, sandy soils, often forming wholly or partially consolidated dunes, located in an irregular 40 square mile area, in southwestern San Bernardino and northwestern Riverside Counties (Soil Conservation Service, 1980).

Fine unconsolidated soils are required for oviposition. The female fly inserts the end of her abdomen deep into the soil to lay her eggs (Rogers and Mattoni, 1993). The life history of the larval stages are unknown, however, it is presumed, that the larvae develop underground (Greg Ballmer, D. Hawks, pers. comm.). The Delhi Sands Flower-loving Fly's adult flight period lasts approximately ten weeks from late June through mid-September. The adult is approximately 1 inch long, tan to orange-brown in color, with dark brown bands and spots upon its abdomen. Its wings are hyaline. It has large green eyes and a long slender proboscis, which it has been seen to use to feed upon nectar from California buckwheat and telegraph weed. The adults frequent open areas, usually near unconsolidated soil. The adult males patrol open areas looking for females to mate with. The females are more sedentary and perch upon plants or sit upon the ground for long periods. Adults are most often observed from 9 or 10 AM until 3 or 4 PM.

The DSFLF is frequently associated with certain plants: California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), annual bursage (*Ambrosia acanthicarpa*), and telegraph weed (*Heterotheca grandiflora*), are sometimes called "indicator plants". Other native plant species also occur in DSFLF habitat: California evening primrose (*Oenothera californica*), deerweed (*Lotus scoparius*), lessinga (*Lessingia glandulifera*), rancher's fiddleneck (*Amsinckia menziesii*), sapphire woolly-star (*Eriastrum sapphirinum*), and Thurber's buckwheat (*Eriogonum thurberi*).

Delhi Sands Flower-loving Fly Recovery Plan

In 1997 the U.S. Fish and Wildlife Service issued the final recovery plan for the Delhi Sands Flower-loving Fly (USFWS, 1997). The plan establishes three recovery units: the Colton, Jurupa, and Ontario Recovery Units. The Colton Recovery Unit contains the most known habitat,

followed by the Jurupa Recovery Unit. Of the three recovery units, the Ontario Recovery Unit contains the least suitable habitat. Most of the Ontario Recovery Unit's habitat has been degraded by long-term agricultural use and much of the remainder of "suitable" habitat is highly fragmented and is in very close proximity to residential, commercial, or industrial development. While the fly is known to occur in the Ontario Recovery Unit, the possibility of using the Ontario Recovery Unit to protect the Delhi Sands Flower-loving Fly is limited because of its prior history and fragmented nature.

The Poultry Project site is located within the Colton Recovery Unit.

Methods

Prior to the initiation of the focused survey, the Carlsbad Field Office of the USFWS was notified on June 28, 2018 of Powell Environmental Consultant's intent to perform the survey. This focused survey was initiated on July 2, 2018 and continued with biweekly site surveys until September 19, 2018. All field surveys and activities associated with this study were conducted in accordance with the Interim General Guidelines for the Delhi Sands Flower-loving Fly and conditions set forth in the surveyors 10(a)(1)(A) permits. Surveys were conducted by entomologist Dale Powell PhD and Jun Powell (authorized under permit TE-006559-6). Survey dates and times, ambient air temperatures, wind speed, general weather conditions, insect families/species detected, and other pertinent field data were recorded on field survey forms and are included in Table 1 and in the Appendices.

Results and Discussion

No Delhi Sands Flower-loving Flies were observed on the project site during the focused survey. The closest known observation of the fly in Rialto was approximately 0.1 miles west of this site. Other species of insect fauna which are relatively closely related to the fly and which are associated with Delhi sands were observed upon the site. Another member of the family Mydidae and other members of the closely related family Asilidae were noted as well. These insects are frequently associated with the Delhi Sands Flower-loving Fly and can be considered indicators that the site may have potential as suitable fly habitat, even though the site has been altered by various disturbances. A small number of the Delhi Sands Flower-loving Fly "indicator" plants California croton (*Croton californicus*) and telegraph weed (*Heterotheca grandiflora*) were observed growing upon the site.

Delhi Sands Flower-loving Fly Survey Results

Date	Time	Minutes Surveyed	Weather (at start)	Temp (°F)	Wind (mph) aver*/max
7/2/18 ²	13:00-13:25	25	Clear	86°	3/7
7/5/18 ¹	12:30-13:00	30	Clear	99°	4/7
7/9/18 ¹	12:25-13:15	20	Haze	100°	4/8
7/11/18 ²	12:25-13:00	35	Partly Cloudy	94°	3/6
7/16/18 ¹	13:50-14:10	20	Clear	95°	3/6
7/19/18 ²	14:05-14:35	30	Clear	101°	3/5
7/23/18 ²	11:15-11:45	30	Clear	95°	2/4
7/26/18 ²	11:50-12:20	30	Clear	86°	1/3
7/30/18 ²	11:15-11:45	30	90% Clouds	94°	2/5
8/1/18 ²	11:05-11:30	25	Clear	89°	2/4
8/6/18 ²	11:45-12:15	30	Clear	98°	2/4
8/8/18 ²	11:50-12:25	35	Haze	91°	2/4
8/13/18 ²	11:30-12:00	30	Clear	87°	3/5
8/15/18 ²	11:25-11:55	30	Clear	87°	2/4
8/20/18 ²	12:55-13:15	20	Clear	91°	2/4
8/22/18 ³	12:30-12:50	40	Clear	88°	2/4
8/27/18 ²	12:15-12:40	25	Clear	77°	4/6
8/29/18 ²	09:45-10:15	30	50% Clouds	77°	0/1
9/3/18 ³	12:50-13:05	30	Clear	84°	3/6
9/5/18 ³	12:35-12:50	30	Clear	81°	4/6
9/10/18 ³	12:35-12:50	30	Clear	84°	2/4
9/12/18 ³	12:45-13:00	30	Clear	80°	0/0
9/17/18 ³	12:45-13:05	40	Clear	85°	2/4
9/19/18 ²	09:45-10:15	30	Clear	71°	0/1

¹ Dale Powell

² Jun Powell

³ Dale and Jun Powell

* Over a 20 second period.

REFERENCES

- Emmel, T.C. and J.F. Emmel. 1973. The Butterflies of Southern California. Natural History Museum of Los Angeles. Science Series 26: 1-148.
- Hickman, J.C. (editor). 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, California. 1400 pp.
- Rogers, R. and M. Mattoni. 1993. Observations on the natural history and conservation biology of the giant flower loving flies, *Rhaphiomidas* (Diptera: Apioceridae). Dipterological Research 4(1-2): 21-34.
- Scott, S. (editor). 1999. Field Guide to the Birds of North America. Third Edition. National Geographic Society, Washington D.C. 480 pp.
- U.S. Department of Agriculture, Soil Conservation Service, 1971. Soil Survey of Western Riverside Area, California. U.S. Gov. Printing Office, Washington D.C. 188 pp.
- U.S. Department of Agriculture, Soil Conservation Service, 1980. Soil Survey of San Bernardino County Southwestern Part, California. U.S. Gov. Printing Office, Washington D.C.
- U.S. Fish and Wildlife Service. 1997. Final Recovery Plan for the Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*). U.S. Fish and Wildlife Service, Portland, OR. 51 pp.

APPENDIX

SUBCONTRACTOR CONCURRENCE

I, Dale A. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Poultry Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

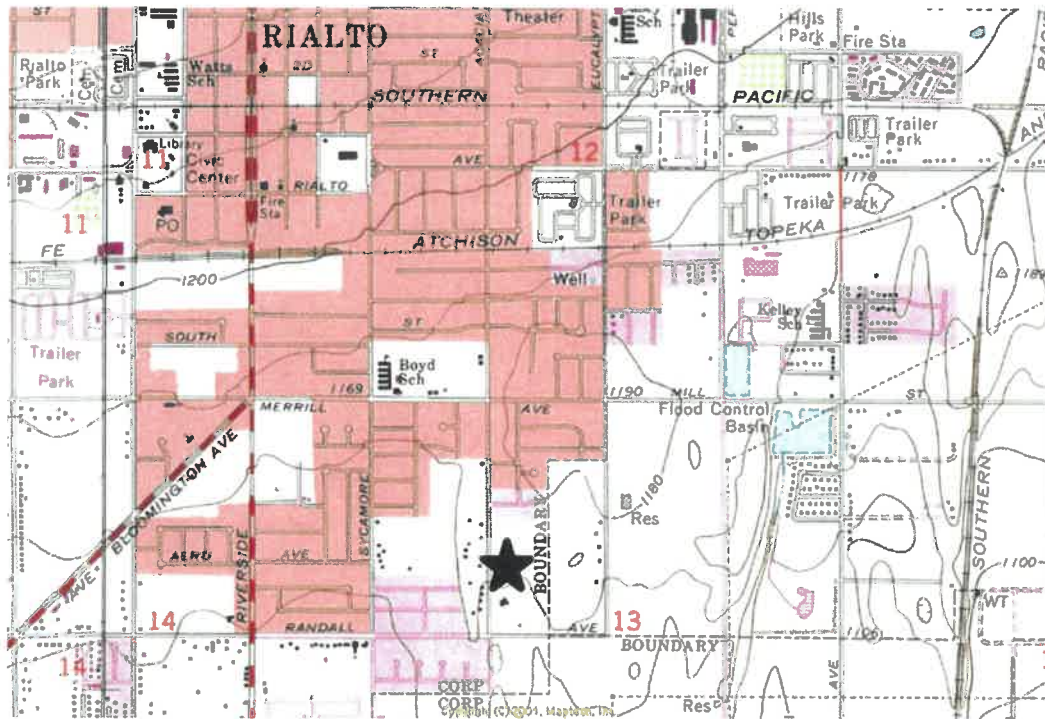
Dale A. Powell 10/2/2018
SIGNATURE DATE

I, Jun R. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Poultry Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

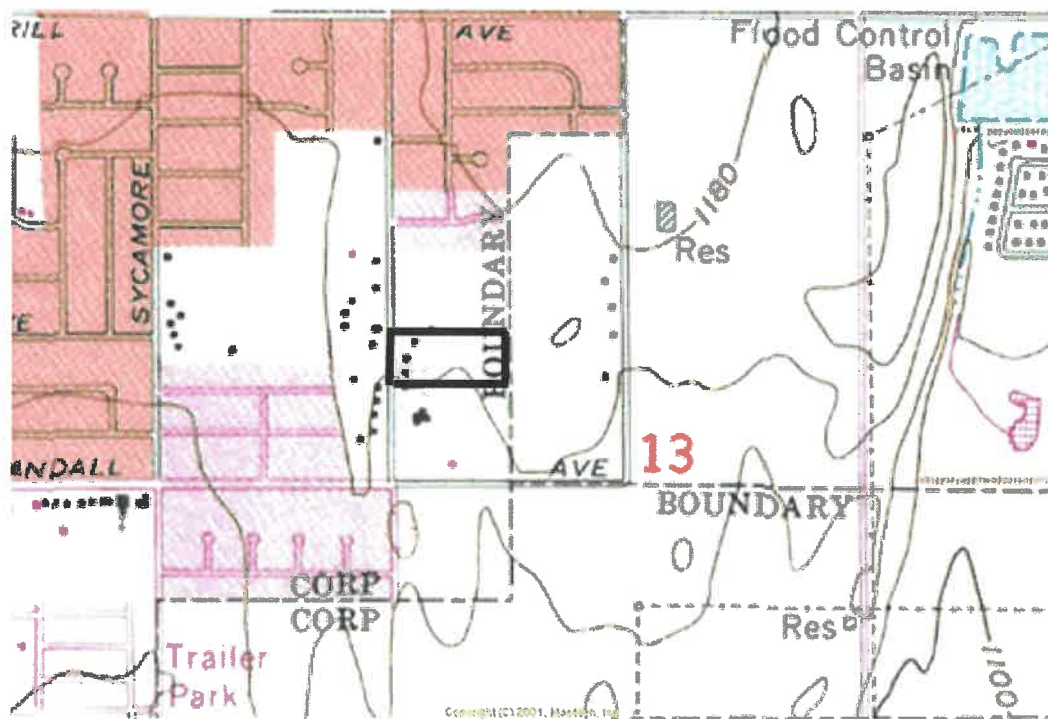
Jun R. Powell 10/2/2018
SIGNATURE DATE

APPENDIX

Map 1. General location of the Acacia and Randall Avenues Poultry Project.



Map 2. Location of the Acacia and Randall Avenues Poultry Project site.



ACACIA AND RANDALL AVENUES POULTRY PROJECT SITE

Picture 1. Overview of the site facing north from the southwestern corner.



Picture 2. Overview of the site facing northeast from the southwestern corner.



ACACIA AND RANDALL AVENUES POULTRY PROJECT SITE

Picture 3. Overview of the site facing east from the southwestern corner.



FIELD NOTES

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: Poultry Site

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
7/2/18	Temp					86°		
Week	Wind					2/7		
1	Weath					Clear		
7/5	Temp				99°			
Week	Wind				4/20			
	Weath				Clear			
7/9	Temp				100°			
Week	Wind				4/9			
2	Weath				Hazy			
7/11	Temp				94°			
Week	Wind				2/6			
2	Weath				PC			
7/16	Temp					95°		
Week	Wind					3/6		
3	Weath					Clear		
7/19	Temp					101°		
Week	Wind					3/5		
3	Weath					Clear		
7/23	Temp			95°				
Week	Wind			2/4				
4	Weath			Clear				
7/26	Temp				86°			
Week	Wind				1/3			
4	Weath				Clear			
7/30	Temp				94°			
Week	Wind				2/5			
5	Weath				4p%cloud			
8/1	Temp		89°					
Week	Wind		2/4					
5	Weath		Clear					
8/6	Temp				98°			
Week	Wind				2/5			
5	Weath				Clear			
8/8	Temp			91°				
Week	Wind			2/9				
6	Weath			Hazy				
8/13	Temp			97°				
Week	Wind			2/5				
7	Weath			Clear				

Sun-H-Fire

Wind: First number is average (20 seconds) / second number is maximum.

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: Poultry site

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
8/15/18	Temp			87°				
Week	Wind			2/4				
7	Weath			clear				
8/20	Temp					91°		
Week	Wind					2/4		
8	Weath					clear		
8/22	Temp					88°		
Week	Wind					2/4		
8	Weath					clear		
8/27	Temp				77°			
Week	Wind				4/6			
9	Weath				clear			
8/29	Temp		77					
Week	Wind		0/1					
9	Weath		100% cloud					
9/2	Temp				84°			
Week	Wind				3/6			
10	Weath				clear			
9/5	Temp				81°			
Week	Wind				4/6			
10	Weath				clear			
9/10	Temp				83°			
Week	Wind				2/4			
11	Weath				clear			
9/12	Temp				80°			
Week	Wind				0/0			
11	Weath				clear			
9/17	Temp					85°		
Week	Wind					2/4		
12	Weath					clear		
9/19	Temp		71°					
Week	Wind		0/1					
12	Weath		clear					
	Temp							
Week	Wind							
	Weath							
	Temp							
Week	Wind							
	Weath							

Wind: First number is average (20 seconds) / second number is maximum.

Delhi Sands Flower-lying Fly Dale and Jun Rong Powell

Dale and Jun Rong Powell

[illegible]

Delhi Sands Flower-loving Fly **Dale and Jun Rong Powell**

Dale and Jun Rong Powell

Poultry Site	7/2/15	7/8	7/9	7/11	7/16	7/19	7/22	7/26	7/30	8/1	8/6	8/9	8/13	8/15	8/21	8/22
Hymenoptera																
Anthophoridae																
Apidae	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Braconidae																
Chrysididae																
Formicidae	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Halictidae																
Ichneumonidae																
Mutillidae																
Pompilidae																
Scoliidae																
Sphecidae				✓		✓				✓	✓			✓	✓	✓
Vespidae	✓												✓		✓	
Lepidoptera																
Danaidae															✓	✓
Hesperiidae							✓		✓	✓	✓	✓	✓	✓	✓	✓
Lycaenidae													✓		✓	✓
Noctuidae															✓	✓
Nymphalidae									✓							
Papilionidae																
Pieridae	✓			✓					✓			✓				✓
Pyralidae																
Sphingidae																
Neuroptera																
Ascalaphidae																
Chrysopidae																
Hemerobiidae																
Myrmeleontidae																
Odonata																
Aeshnidae																
Coenagrionidae														✓	✓	
Libellulidae	✓						✓			✓				✓		✓
Orthoptera																
Acrididae	✓	✓	✓	✓	✓		✓		✓				✓	✓	✓	
Gryllacrididae																
Gryllidae																
Mantidae																
Tettigoniidae																
OTHER																

lower-loving Fly

Dale and Jun Rong Powell

Locality Site	7/7/12	8/6/9	9/13	9/15	9/16	9/17	9/18
Coleoptera							
Carabidae							
Chrysomelidae							
Coccinellidae							
Curculionidae							
Rhipiphoridae							
Scarabaeidae		✓	/ /			✓	
Tenebrionidae							
Dermaptera							
Diptera							
Apioceridae							
Asilidae							
Bombyliidae			/		/ / ✓		
Calliphoridae							
Chironomidae							
Conopidae							
Muscidae	✓	✓	/ /	/ /	✓ / ✓	✓	✓
Mydidae							
Sarcophagidae							
Stratiomyidae							
Syrphidae				/			
Tabanidae							
Tachinidae							
Hemiptera							
Anthracoridiae							
Lygaeidae			/ /			✓	
Miridae							
Nabidae							
Pentatomidae							
Reduviidae							
Scutelleridae							
Homoptera							
Aphididae							
Cercopidae							
Cicadellidae							
Cicadidae							
Membracidae							

**ACACIA AND RANDALL AVENUES
NORTH PROJECT SITE
(APN Numbers 0131-131-13 & 0131-131-14)**

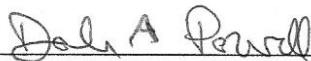
**Focused Survey for the
Delhi Sands Flower-loving Fly**

Prepared for:

Michael Ramirez
Verde Vistas
P.O. BOX 245
Monterey Park, CA 91754
(760) 810-8548
verdevistas@aol.com

Prepared by:

Powell Environmental Consultants
146 West Broadbent Drive
Riverside, CA 92507
Phone/FAX (951) 686-1497
Cellular Phone (951) 440-4235
dajrpowell@msn.com



Dale A. Powell Ph.D.
TE-006559-7

September 22, 2019

ACACIA AND RANDALL AVENUES NORTH PROJECT SITE

Focused Survey for the Delhi Sands Flower-loving Fly

September 22, 2019

Introduction

This report presents the results of a focused survey for the Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) on a 5-acre site located in the City of Rialto, San Bernardino County. This property is under consideration for residential development in the future. The County of San Bernardino and the U.S. Fish and Wildlife Service require that focused surveys be conducted to determine whether this proposed development would impact this federally endangered insect. This survey, conducted by Powell Environmental Consulting, resulted in negative findings. Previous surveys were conducted by Powell Environmental Consultants upon the site in 2004, 2005, 2014, 2015, 2016, 2017, 2018. Those surveys also resulted in negative findings.

Site Description

The approximately 5-acre site is located near the city of Rialto, on a portion of the northwest central area of Section 13, Township 1 South, Range 5 West; San Bernardino Baseline and Meridian; USGS 7.5' San Bernardino South Quad (See Maps 1 & 2). It is rectangular in outline. The site sits on the east side of Acacia Avenue, a few hundred feet north of Randall Avenue (APN Numbers 0131-131-13 & 0131-131-14). The site is relatively flat and its elevation is approximately 1,165 feet above sea level. Adjacent to the north and to the east of the site are houses. South of the southeastern area of the site is a poultry farm and houses lie south of the southeastern area of the site. Across Acacia Avenue, to the west, are houses.

According to a soil map (U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of San Bernardino County Southwestern Part, California, 1980.), the site possesses Delhi Fine Sand (Db). The Delhi fine sands is a “nearly level to strongly sloping soil on alluvial fans that have been reworked by wind action.” (U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of San Bernardino County Southwestern Part, California, 1980.). Based upon my field examination I generally concur with the soil map.

Most of the site is covered by exposed Delhi sands. There is very little vegetation growing upon the site – under 5% of the soil was covered by vegetation.

The most abundant plant observed growing upon the site was Bermuda grass (*Cynodon dactylon*). Of the Delhi Sands Flower-loving Fly “indicator” plants only a small number of California crotons (*Croton californicus*), annual bursages (*Ambrosia acanthicarpa*), and

telegraph weeds (*Heterotheca grandiflora*) were observed growing upon the site. Disturbances observed on the site include disking, the invasion of non-native plant and animal species, and minor trash dumping.

Delhi Sands Flower-loving Fly Background Information

The Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) (family Mydidae) was listed as an endangered species under the Endangered Species Act, as amended on September 23, 1993. The California Natural Diversity Data Base lists the DSFLF rank as being: G1T1S1 - Federally listed as being extremely endangered (G1); found only in California (T1); and as being extremely endangered in California (S1).

The Delhi Sands Flower-loving Fly is considered to be endangered primarily because of the loss of its habitat, mainly due to the habitat's conversion to agricultural, residential, and industrial uses. Its historic range has been reduced by over approximately 97% (USFWS, 1993). The fly is known only to inhabit areas where Delhi series soils are located. These soils consist of fine, sandy soils, often forming wholly or partially consolidated dunes, located in an irregular 40 square mile area, in southwestern San Bernardino and northwestern Riverside Counties (Soil Conservation Service, 1980).

Fine unconsolidated soils are required for oviposition. The female fly inserts the end of her abdomen deep into the soil to lay her eggs (Rogers and Mattoni, 1993). The life history of the larval stages are unknown, however, it is presumed, that the larvae develop underground (Greg Ballmer, D. Hawks, pers. comm.). The Delhi Sands Flower-loving Fly's adult flight period lasts approximately six weeks from late June through mid-September. The adult is approximately 1 inch long, tan to orange-brown in color, with dark brown bands and spots upon its abdomen. Its wings are hyaline. It has large green eyes and a long slender proboscis, which it has been seen to use to feed upon nectar from California buckwheat and telegraph weed. The adults frequent open areas, usually near unconsolidated soil. The adult males patrol open areas looking for females to mate with. The females are more sedentary and perch upon plants or sit upon the ground for long periods. Adults are most often observed from 9 or 10 AM until 3 or 4 PM.

The DSFLF is frequently associated with certain plants: California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), annual bursage (*Ambrosia acanthicarpa*), and telegraph weed (*Heterotheca grandiflora*), are sometimes called "indicator plants". Other native plant species also occur in DSFLF habitat: California evening primrose (*Oenothera californica*), deerweed (*Lotus scoparius*), lessinga (*Lessingia glandulifera*), rancher's fiddleneck (*Amsinckia menziesii*), sapphire woolly-star (*Eriastrum sapphirinum*), and Thurber's buckwheat (*Eriogonum thurberi*)

Delhi Sands Flower-loving Fly Recovery Plan

In 1997 the U.S. Fish and Wildlife Service issued the final recovery plan for the Delhi Sands Flower-loving Fly (USFWS, 1997). The plan establishes three recovery units: the Colton, Jurupa, and Ontario Recovery Units. The Colton Recovery Unit contains the most known habitat, followed by the Jurupa Recovery Unit. Of the three recovery units, the Ontario Recovery Unit

contains the least suitable habitat. Most of the Ontario Recovery Unit's habitat has been degraded by long-term agricultural use and much of the remainder of "suitable" habitat is highly fragmented and is in very close proximity to residential, commercial, or industrial development. While the fly is known to occur in the Ontario Recovery Unit, the possibility of using the Ontario Recovery Unit to protect the Delhi Sands Flower-loving Fly is limited because of its prior history and fragmented nature.

The Acacia and Randall Avenues Project site is located within the Colton Recovery Unit.

Methods

Prior to the initiation of the focused survey, the Carlsbad Field Office of the USFWS was notified on June 27, 2019 of Powell Environmental Consultant's intent to perform the survey. This focused survey was initiated on July 1, 2019 and continued with biweekly site surveys until September 18, 2019. All field surveys and activities associated with this study were conducted in accordance with the Interim General Guidelines for the Delhi Sands Flower-loving Fly and conditions set forth in the surveyors 10(a)(1)(A) permits. Surveys were conducted by entomologist Dale Powell PhD and Jun Powell (authorized under permit TE-006559-7). Survey dates and times, ambient air temperatures, wind speed, general weather conditions, insect families/species detected, and other pertinent field data were recorded on field survey forms and are included in Table 1 and in the Appendices.

Results and Discussion

No Delhi Sands Flower-loving Flies were observed on the project site during the focused survey. The closest known observation of the fly in Rialto was approximately 0.1 miles west of this site. No member of the family Mydidae was observed on the project site. Other species of the closely related families Asilidae and Apioceridae, which are associated with Delhi sands, were observed upon the site. These insects are frequently associated with the Delhi Sands Flower-loving Fly and can be considered indicators that the site may have potential as suitable fly habitat, even though the site has been altered by various disturbances. The site had been cleared of vegetation earlier in the year, before the survey season began, and very few plants were observed growing upon the site. A small number of the Delhi Sands Flower-loving Fly "indicator" plants, California croton (*Croton californicus*), telegraph weed (*Heterotheca grandiflora*), and annual bursages (*Ambrosia acanthicarpa*) were observed growing upon the site.

Table 1. Dates, survey times, person hours, and weather conditions.

Delhi Sands Flower-loving Fly Survey Results

Date	Time	Minutes Surveyed	Weather (at start)	Temp (°F)	Wind (mph) aver*/max
7/1/19 ²	12:30-13:00	30	Clear	92°	1/3
7/3/19 ²	12:30-13:00	30	40% Clouds	88°	1/3
7/8/19 ²	11:35-12:05	30	Clear	78°	1/3
7/10/19 ²	10:40-11:10	30	Clear	80°	0/1
7/15/19 ²	11:25-11:50	25	Clear	91°	2/4
7/17/19 ²	09:50-10:20	30	Clear	85°	0/1
7/22/19 ²	12:00-12:30	30	60% Clouds	89°	1/3
7/24/19 ²	10:50-11:20	30	20% Clouds	90°	1/3
7/29/19 ²	11:50-12:20	30	20% Clouds	92°	1/3
7/31/19 ²	12:40-13:10	30	Clear	95°	2/4
8/5/19 ²	11:40-12:10	30	Clear	97°	1/3
8/7/19 ²	12:35-13:05	30	60% Clouds	88°	1/3
8/12/19 ²	12:30-13:00	30	Clear	87°	1/3
8/14/19 ²	10:40-11:10	30	Clear	87°	0/1
8/19/19 ²	12:00-12:30	30	Clear	87°	1/3
8/21/19 ²	10:40-11:10	30	Clear	85°	0/1
8/27/19 ²	12:00-12:30	30	Clear	96°	0/1
8/29/19 ²	10:50-11:20	30	Clear	90°	1/3
9/2/19 ²	12:20-12:50	30	40% Clouds	96°	1/3
9/4/19 ²	11:55-12:25	30	30% Clouds	100°	1/3
9/9/19 ²	10:50-11:20	30	10% Clouds	80°	1/3
9/11/19 ¹	12:30-12:55	25	Clear	78°	4/6
9/16/19 ²	10:20-10:50	30	40% Clouds	84°	0/1
9/18/19 ²	11:40-12:10	30	Clear	82°	0/1

¹ Dale Powell

² Jun Powell

* Over a 20 second period.

REFERENCES

- Emmel, T.C. and J.F. Emmel. 1973. The Butterflies of Southern California. Natural History Museum of Los Angeles. Science Series 26: 1-148.
- Hickman, J.C. (editor). 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, California. 1400 pp.
- Rogers, R. and M. Mattoni. 1993. Observations on the natural history and conservation biology of the giant flower loving flies, *Rhaphiomidas* (Diptera: Apioceridae). Dipterological Research 4(1-2): 21-34.
- Scott, S. (editor). 1999. Field Guide to the Birds of North America. Third Edition. National Geographic Society, Washington D.C. 480 pp.
- U.S. Department of Agriculture, Soil Conservation Service, 1971. Soil Survey of Western Riverside Area, California. U.S. Gov. Printing Office, Washington D.C. 188 pp.
- U.S. Department of Agriculture, Soil Conservation Service, 1980. Soil Survey of San Bernardino County Southwestern Part, California. U.S. Gov. Printing Office, Washington D.C.
- U.S. Fish and Wildlife Service. 1997. Final Recovery Plan for the Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*). U.S. Fish and Wildlife Service, Portland, OR. 51 pp.

APPENDIX

SUBCONTRACTOR CONCURRENCE

I, Dale A. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Acacia and Randall Avenues North Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

Dale A Powell
SIGNATURE

9/22/2019
DATE

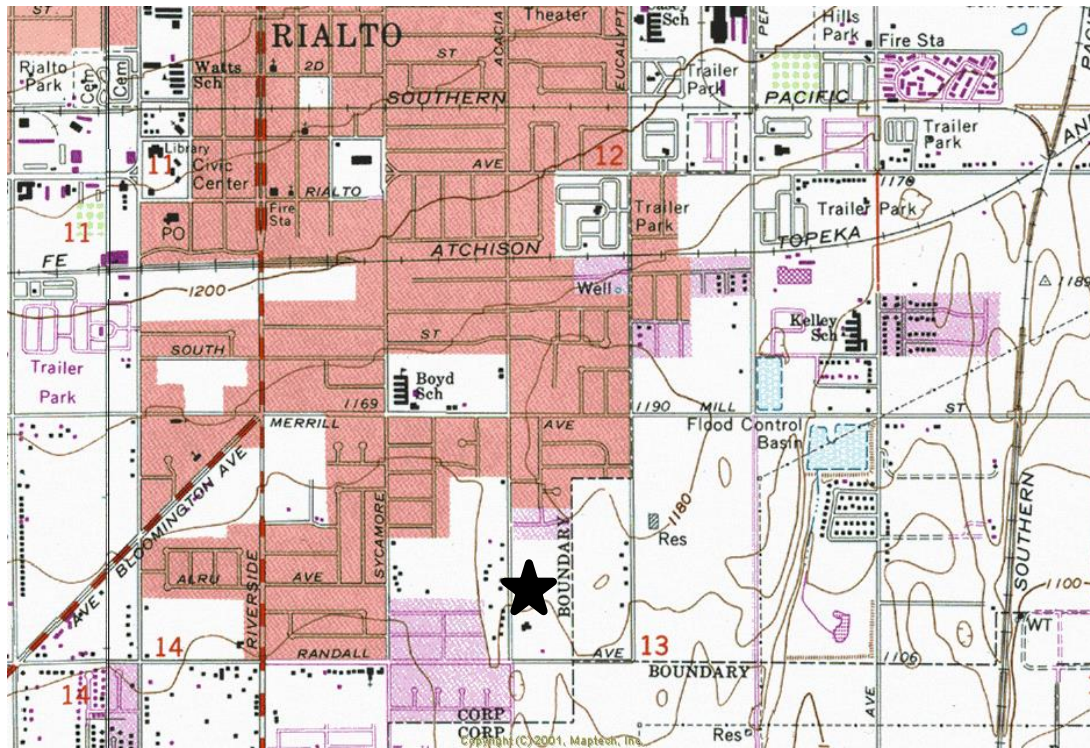
I, Jun R. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Acacia and Randall Avenues North Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

Jun R. Powell
SIGNATURE

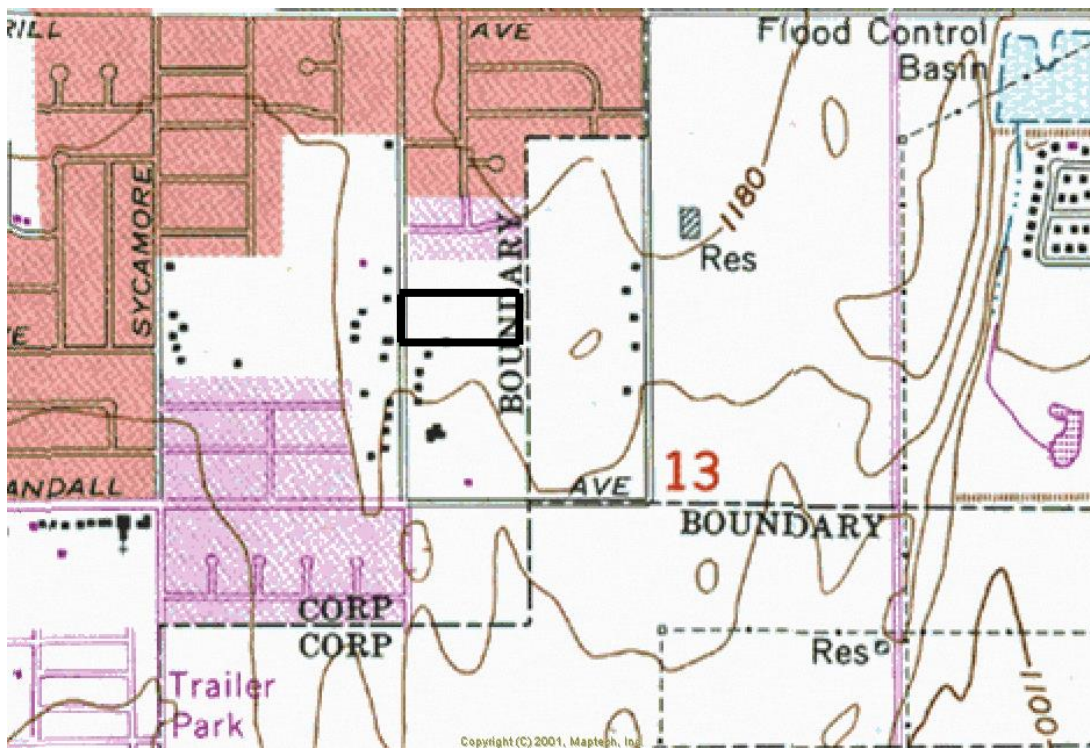
9/22/2019
DATE

APPENDIX

Map 1. General location of the Acacia and Randall Avenues North Project.



Map 2. Location of the Acacia and Randall Avenues North Project site.



ACACIA AND RANDALL AVENUES NORTH PROJECT SITE

Picture 1. Overview of the site facing north from the southwestern corner.



Picture 2. Overview of the site facing northeast from the southwestern corner.



ACACIA AND RANDALL AVENUES NORTH PROJECT SITE

Picture 3. Overview of the site facing east from the southwestern corner.



Picture 4. Overview of the site facing north from the southeastern corner.



FIELD NOTES

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: Acacia (north)

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
7/1/19	Temp				92°			
Week	Wind				1/3			
1	Weath				clear			
7/3	Temp				88°			
Week	Wind				1/3			
1	Weath				44% Clouds			
7/8	Temp			78°				
Week	Wind			1/3				
2	Weath			clear				
7/10	Temp		80°					
Week	Wind		0/1					
2	Weath		clear					
7/15	Temp			91°				
Week	Wind			2/4				
3	Weath			clear				
7/17	Temp		85°					
Week	Wind		0/1					
3	Weath		clear					
7/22	Temp				89°			
Week	Wind				1/3			
4	Weath				60% Clouds			
7/24	Temp			90°				
Week	Wind			1/3				
4	Weath			20% Clouds				
7/29	Temp				92°			
Week	Wind				1/3			
5	Weath				20% Clouds			
7/31	Temp					95°		
Week	Wind					2/4		
5	Weath					clear		
8/5	Temp				97°			
Week	Wind				1/3			
6	Weath				clear			
8/7	Temp				88°			
Week	Wind				1/3			
6	Weath				60% Clouds			
8/12	Temp				87°			
Week	Wind				1/3			
7	Weath				clear			

Wind: First number is average (20 seconds) / second number is maximum.

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: Acacia (North)

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
8/14/19	Temp		87°					
Week	Wind		0/1					
7	Weath		cloud					
8/19	Temp				87°			
Week	Wind				1/3			
8	Weath				clear			
8/21	Temp		85°					
Week	Wind		0/1					
8	Weath		clear					
8/27	Temp				96°			
Week	Wind				0/1			
9	Weath				clear			
8/29	Temp			90°				
Week	Wind			1/3				
9	Weath			clear				
9/2	Temp				96°			
Week	Wind				1/3			
10	Weath				40% clouds			
9/4	Temp				100°			
Week	Wind				1/3			
10	Weath				30% clouds			
9/9	Temp			80°				
Week	Wind			1/3				
11	Weath			10% clouds				
9/11	Temp				78°			
Week	Wind				4/6			
11	Weath				clear			
9/16	Temp		84°					
Week	Wind		0/1					
12	Weath		40% clouds					
9/18	Temp			82°				
Week	Wind			0/1				
12	Weath			clear				
	Temp							
Week	Wind							
	Weath							
	Temp							
Week	Wind							
	Weath							

Wind: First number is average (20 seconds) / second number is maximum.

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

[illegible]

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

[illegible]

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

[illegible]

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

[illegible]

**ACACIA AND RANDALL AVENUES
POULTRY PROJECT SITE
(APN Number 0131-131-23)**

**Focused Survey for the
Delhi Sands Flower-loving Fly**

Prepared for:

Michael Ramirez
Verde Vistas
P.O. BOX 245
Monterey Park, CA 91754
(760) 810-8548
verdevistas@aol.com

Prepared by:

Powell Environmental Consultants
146 West Broadbent Drive
Riverside, CA 92507
Phone/FAX (951) 686-1497
Cellular Phone (951) 440-4235
dajrpowell@msn.com


Dale A. Powell Ph.D.
TE-006559-7

September 22, 2019

ACACIA AND RANDALL AVENUES POULTRY PROJECT SITE

Focused Survey for the Delhi Sands Flower-loving Fly

September 22, 2019

Introduction

This report presents the results of a focused survey for the Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) on a 3.89-acre site located in the City of Rialto, San Bernardino County. This property is under consideration for residential development in the future. The County of San Bernardino and the U.S. Fish and Wildlife Service require that focused surveys be conducted to determine whether this proposed development would impact this federally endangered insect. This survey, conducted by Powell Environmental Consulting, resulted in negative results. The site was also surveyed in 2017 and 2018 by Powell Environmental Consultants, with negative results.

Site Description

The 3.89-acre site is located near the city of Rialto, on a portion of the northwest central area of Section 13, Township 1 South, Range 5 West; San Bernardino Baseline and Meridian; USGS 7.5' San Bernardino South Quad (See Maps 1 & 2). It is rectangular in outline. The site sits on the east side of Acacia Avenue, a few hundred feet north of Randall Avenue (APN Number 0131-131-23). The site is relatively flat and its elevation is approximately 1,165 feet above sea level. Adjacent to the north of the site is an open field. To the east of the site are houses. South of the southeastern area of the site is an open field and houses lie south of the southeastern area of the site. Across Acacia Avenue, to the west, are houses. In the eastern portion of the site are poultry houses. In the center of the site is a residential house and buildings with a grassy area to the west with trees and ornamentals growing upon it.

According to a soil map (U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of San Bernardino County Southwestern Part, California, 1980.), the site possesses Delhi Fine Sand (Db). The Delhi fine sands is a “nearly level to strongly sloping soil on alluvial fans that have been reworked by wind action.” (U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of San Bernardino County Southwestern Part, California, 1980.). Based upon my field examination I generally concur with the soil map.

There are large areas of open Delhi sands scattered throughout the project site around the buildings. There is very little native vegetation growing upon the site.

The most abundant plant observed growing upon the site was Bermuda grass (*Cynodon dactylon*) and introduced trees, shrubs, and other ornamentals. Of the Delhi Sands Flower-loving Fly “indicator” plants only a small number of California croton (*Croton californicus*), annual

bursage (*Ambrosia acanthicarpa*), and telegraph weeds (*Heterotheca grandiflora*) were observed. Disturbances observed on the site include the invasion of non-native plant and animal species, pedestrian and motor vehicle traffic, and minor trash dumping.

Delhi Sands Flower-loving Fly Background Information

The Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) (family Mydidae) was listed as an endangered species under the Endangered Species Act, as amended on September 23, 1993. The California Natural Diversity Data Base lists the DSFLF rank as being: G1T1S1 - Federally listed as being extremely endangered (G1); found only in California (T1); and as being extremely endangered in California (S1).

The Delhi Sands Flower-loving Fly is considered to be endangered primarily because of the loss of its habitat, mainly due to the habitat's conversion to agricultural, residential, and industrial uses. Its historic range has been reduced by over approximately 97% (USFWS, 1993). The fly is known only to inhabit areas where Delhi series soils are located. These soils consist of fine, sandy soils, often forming wholly or partially consolidated dunes, located in an irregular 40 square mile area, in southwestern San Bernardino and northwestern Riverside Counties (Soil Conservation Service, 1980).

Fine unconsolidated soils are required for oviposition. The female fly inserts the end of her abdomen deep into the soil to lay her eggs (Rogers and Mattoni, 1993). The life history of the larval stages are unknown, however, it is presumed, that the larvae develop underground (Greg Ballmer, D. Hawks, pers. comm.). The Delhi Sands Flower-loving Fly's adult flight period lasts approximately ten weeks from late June through mid-September. The adult is approximately 1 inch long, tan to orange-brown in color, with dark brown bands and spots upon its abdomen. Its wings are hyaline. It has large green eyes and a long slender proboscis, which it has been seen to use to feed upon nectar from California buckwheat and telegraph weed. The adults frequent open areas, usually near unconsolidated soil. The adult males patrol open areas looking for females to mate with. The females are more sedentary and perch upon plants or sit upon the ground for long periods. Adults are most often observed from 9 or 10 AM until 3 or 4 PM.

The DSFLF is frequently associated with certain plants: California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), annual bursage (*Ambrosia acanthicarpa*), and telegraph weed (*Heterotheca grandiflora*), are sometimes called "indicator plants". Other native plant species also occur in DSFLF habitat: California evening primrose (*Oenothera californica*), deerweed (*Lotus scoparius*), lessinga (*Lessingia glandulifera*), rancher's fiddleneck (*Amsinckia menziesii*), sapphire woolly-star (*Eriastrum sapphirinum*), and Thurber's buckwheat (*Eriogonum thurberi*).

Delhi Sands Flower-loving Fly Recovery Plan

In 1997 the U.S. Fish and Wildlife Service issued the final recovery plan for the Delhi Sands Flower-loving Fly (USFWS, 1997). The plan establishes three recovery units: the Colton, Jurupa, and Ontario Recovery Units. The Colton Recovery Unit contains the most known habitat,

followed by the Jurupa Recovery Unit. Of the three recovery units, the Ontario Recovery Unit contains the least suitable habitat. Most of the Ontario Recovery Unit's habitat has been degraded by long-term agricultural use and much of the remainder of "suitable" habitat is highly fragmented and is in very close proximity to residential, commercial, or industrial development. While the fly is known to occur in the Ontario Recovery Unit, the possibility of using the Ontario Recovery Unit to protect the Delhi Sands Flower-loving Fly is limited because of its prior history and fragmented nature.

The Poultry Project site is located within the Colton Recovery Unit.

Methods

Prior to the initiation of the focused survey, the Carlsbad Field Office of the USFWS was notified on June 27, 2019 of Powell Environmental Consultant's intent to perform the survey. This focused survey was initiated on July 1, 2019 and continued with biweekly site surveys until September 18, 2019. All field surveys and activities associated with this study were conducted in accordance with the Interim General Guidelines for the Delhi Sands Flower-loving Fly and conditions set forth in the surveyors 10(a)(1)(A) permits. Surveys were conducted by entomologist Dale Powell PhD and Jun Powell (authorized under permit TE-006559-7). Survey dates and times, ambient air temperatures, wind speed, general weather conditions, insect families/species detected, and other pertinent field data were recorded on field survey forms and are included in Table 1 and in the Appendices.

Results and Discussion

No Delhi Sands Flower-loving Flies were observed on the project site during the focused survey. The closest known observation of the fly in Rialto was approximately 0.1 miles west of this site. Other species of insect fauna which are relatively closely related to the fly and which are associated with Delhi sands were observed upon the site. No members of the family Mydidae were observed upon the site. Members of the closely related families Asilidae and Apioceridae were noted. These insects are frequently associated with the Delhi Sands Flower-loving Fly and can be considered indicators that the site may have potential as suitable fly habitat, even though the site has been altered by various disturbances. A small number of the Delhi Sands Flower-loving Fly "indicator" plants California croton (*Croton californicus*), annual bursage (*Ambrosia acanthicarpa*), and telegraph weed (*Heterotheca grandiflora*) were observed growing upon the site.

Table 1. Dates, survey times, person hours, and weather conditions.

Delhi Sands Flower-loving Fly Survey Results

Date	Time	Minutes Surveyed	Weather (at start)	Temp (°F)	Wind (mph) aver*/max
7/1/19 ²	13:00-13:30	30	Clear	94°	2/4
7/3/19 ²	11:40-12:30	50	40% Clouds	88°	1/3
7/8/19 ²	11:05-11:35	30	Clear	78°	1/3
7/10/19 ²	11:10-11:40	30	Clear	85°	1/3
7/15/19 ²	11:00-11:25	25	Clear	91°	2/4
7/17/19 ²	10:20-10:50	30	Clear	85°	0/1
7/22/19 ²	12:30-13:00	30	60% Clouds	89°	1/3
7/24/19 ²	10:20-10:50	30	40% Clouds	85°	1/3
7/29/19 ²	11:20-11:50	30	20% Clouds	88°	1/3
7/31/19 ²	12:10-12:40	30	Clear	92°	1/3
8/5/19 ²	11:10-11:40	20	Clear	89°	1/2
8/7/19 ²	12:05-12:35	30	60% Clouds	88°	1/2
8/12/19 ²	12:00-12:30	30	Clear	81°	1/3
8/14/19 ²	11:10-11:40	30	Clear	96°	1/3
8/19/19 ²	12:30-13:00	30	Clear	87°	1/3
8/21/19 ²	11:10-11:40	30	Clear	90°	0/1
8/27/19 ²	12:30-13:00	30	Clear	96°	0/1
8/29/19 ²	10:20-10:50	30	Clear	86°	0/1
9/2/19 ²	11:50-12:20	30	30% Clouds	92°	1/3
9/4/19 ²	12:25-12:55	30	30% Clouds	100°	1/3
9/9/19 ²	10:20-10:50	30	Clear	76°	0/1
9/11/19 ¹	12:55-13:25	30	Clear	79°	4/7
9/16/19 ²	09:50-10:20	30	40% Clouds	84°	0/1
9/18/19 ²	11:10-11:40	30	Clear	82°	0/1

¹ Dale Powell

² Jun Powell

* Over a 20 second period.

REFERENCES

- Emmel, T.C. and J.F. Emmel. 1973. The Butterflies of Southern California. Natural History Museum of Los Angeles. Science Series 26: 1-148.
- Hickman, J.C. (editor). 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, California. 1400 pp.
- Rogers, R. and M. Mattoni. 1993. Observations on the natural history and conservation biology of the giant flower loving flies, *Rhaphiomidas* (Diptera: Apioceridae). Dipterological Research 4(1-2): 21-34.
- Scott, S. (editor). 1999. Field Guide to the Birds of North America. Third Edition. National Geographic Society, Washington D.C. 480 pp.
- U.S. Department of Agriculture, Soil Conservation Service, 1971. Soil Survey of Western Riverside Area, California. U.S. Gov. Printing Office, Washington D.C. 188 pp.
- U.S. Department of Agriculture, Soil Conservation Service, 1980. Soil Survey of San Bernardino County Southwestern Part, California. U.S. Gov. Printing Office, Washington D.C.
- U.S. Fish and Wildlife Service. 1997. Final Recovery Plan for the Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*). U.S. Fish and Wildlife Service, Portland, OR. 51 pp.

APPENDIX

SUBCONTRACTOR CONCURRENCE

I, Dale A. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Acacia and Randall Avenues Poultry Farm Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

Dale A. Powell
SIGNATURE

9/22/2019
DATE

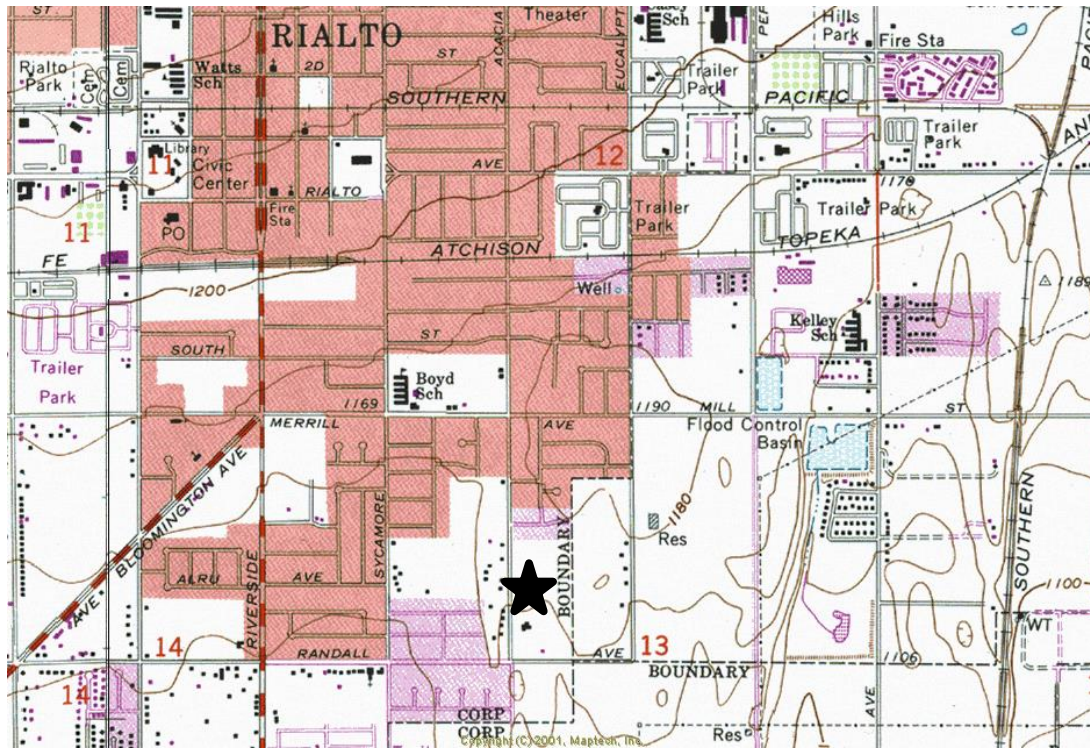
I, Jun R. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Acacia and Randall Avenues Poultry Farm Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

Jun R. Powell
SIGNATURE

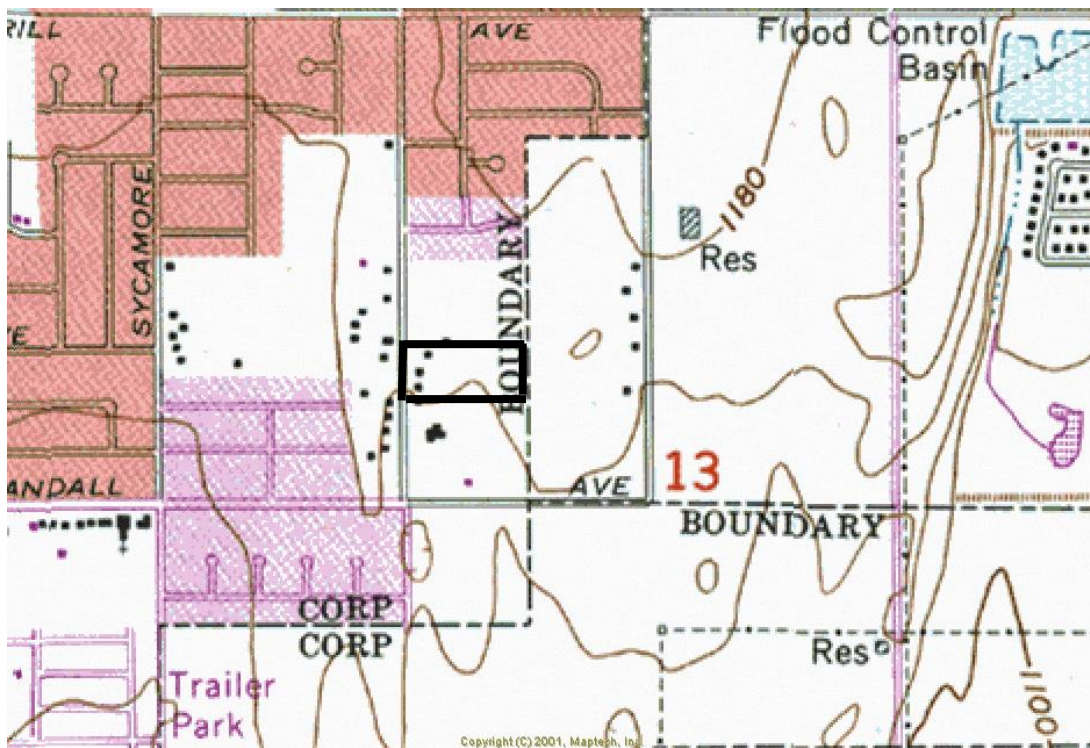
9/22/2019
DATE

APPENDIX

Map 1. General location of the Acacia and Randall Avenues Poultry Project.



Map 2. Location of the Acacia and Randall Avenues Poultry Project site.



ACACIA AND RANDALL AVENUES POULTRY PROJECT SITE

Picture 1. Overview of the site facing north from the southwestern corner.



Picture 2. Overview of the site facing northeast from the southwestern corner.



ACACIA AND RANDALL AVENUES POULTRY PROJECT SITE

Picture 3. Overview of the site facing east from the southwestern corner.



FIELD NOTES

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: chicken farm

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
7/1/19	Temp					94°		
Week	Wind					2/4		
1	Weath					clear		
7/3/19	Temp				88°			
Week	Wind				1/3			
1	Weath				40% clouds			
7/8	Temp			78°				
Week	Wind			1/3				
2	Weath			clear				
7/10	Temp			85°				
Week	Wind			1/3				
2	Weath			clear				
7/15	Temp			91°				
Week	Wind			2/4				
3	Weath			clear				
7/17	Temp		85°					
Week	Wind		0/1					
3	Weath		clear					
7/22	Temp				89°			
Week	Wind				1/3			
4	Weath				60% clouds			
7/24	Temp		85°					
Week	Wind		1/3					
4	Weath		40% clouds					
7/29	Temp			88°				
Week	Wind			1/3				
5	Weath			40% clouds				
7/31	Temp				92°			
Week	Wind				1/3			
5	Weath				clear			
8/5	Temp			89°				
Week	Wind			1/2				
6	Weath			clear				
8/7	Temp				88°			
Week	Wind				1/2			
6	Weath				60% clouds			
8/12	Temp				87°			
Week	Wind				1/3			
7	Weath				clear			

Wind: First number is average (20 seconds) / second number is maximum.

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: *chicken Farm*

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
<i>8/14/19</i>	Temp			<i>96°</i>				
Week	Wind			<i>1/3</i>				
<i>7</i>	Weath			<i>clear</i>				
<i>8/19</i>	Temp				<i>87°</i>			
Week	Wind				<i>1/3</i>			
<i>8</i>	Weath				<i>clear</i>			
<i>8/21</i>	Temp			<i>90°</i>				
Week	Wind			<i>0/1</i>				
<i>8</i>	Weath			<i>clear</i>				
<i>8/27</i>	Temp				<i>96°</i>			
Week	Wind				<i>0/1</i>			
<i>9</i>	Weath				<i>clear</i>			
<i>8/29</i>	Temp		<i>86°</i>					
Week	Wind		<i>0/1</i>					
<i>9</i>	Weath		<i>clear</i>					
<i>9/2</i>	Temp			<i>92°</i>				
Week	Wind			<i>1/3</i>				
<i>10</i>	Weath			<i>30% clouds</i>				
<i>9/4</i>	Temp				<i>100°</i>			
Week	Wind				<i>1/3</i>			
<i>10</i>	Weath				<i>70% clouds</i>			
<i>9/9</i>	Temp		<i>76°</i>					
Week	Wind		<i>0/1</i>					
<i>11</i>	Weath		<i>clear</i>					
<i>9/11</i>	Temp				<i>79°</i>			
Week	Wind				<i>4/7</i>			
<i>11</i>	Weath				<i>clear</i>			
<i>9/16</i>	Temp		<i>84°</i>					
Week	Wind		<i>0/1</i>					
<i>12</i>	Weath		<i>40% clouds</i>					
<i>9/18</i>	Temp			<i>82°</i>				
Week	Wind			<i>0/1</i>				
<i>12</i>	Weath			<i>clear</i>				
	Temp							
Week	Wind							
	Weath							
	Temp							
Week	Wind							
	Weath							

Wind: First number is average (20 seconds) / second number is maximum.

Delhi Sands Flower-loving Fly Dale and Jun Rong Powell

Dale and Jun Rong Powell

[illegible]

Delhi Sands Flower-loving Fly **Dale and Jun Rong Powell**

JP JP JP JP JP JP JP JP JP JP JP JP JP JP JP JP JP

[illegible]

Delhi Sands Flower-loving Fly Dale and Jun Rong Powell

Dale and Jun Rong Powell

[illegible]

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Chicken Farm	7/1	7/2	7/4	7/9	7/11	7/16	7/18								
Hymenoptera															
Anthophoridae															
Apidae	✓	✓	✓	✓	✓	✓	✓								
Braconidae															
Chrysididae															
Formicidae	✓	✓	✓	✓	✓	✓	✓								
Halicitidae															
Ichneumonidae															
Mutillidae															
Pompilidae															
Scoliidae															
Sphecidae	✓	✓	✓	✓	✓		✓	✓							
Vespidae	✓	✓	✓	✓	✓	✓									
Lepidoptera															
Danaidae															
Hesperiidae		✓	✓		✓	✓	✓	✓							
Lycaenidae						✓	✓	✓							
Noctuidae															
Nymphalidae															
Papilionidae	✓	✓					✓								
Pieridae	✓	✓	✓	✓	✓										
Pyralidae															
Sphingidae															
Neuroptera															
Ascalaphidae															
Chrysopidae															
Hemerobiidae															
Myrmeleontidae															
Odonata															
Aeshnidae					✓		✓								
Coenagrionidae		✓			✓		✓								
Libellulidae						✓		✓							
Orthoptera															
Acrididae	✓	✓	✓	✓	✓										
Gryllacrididae															
Gryllidae															
Mantidae															
Tettigoniidae															
OTHER															