

**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:

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TE-006559-6

September 28, 2017

ACACIA AND RANDALL AVENUES NORTH PROJECT SITE

Focused Survey for the Delhi Sands Flower-loving Fly

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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, and 2016. Those surveys resulted in negative findings.

Site Description

The 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 Dehli 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 croton (*Croton californicus*) and telegraph weeds (*Heterotheca grandiflora*) were

observed growing along the western edge of the site. Disturbances observed on the site include discing, 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 July 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 Bur-sage (*Ambrosia acanthicarpa*), and telegraph weed (*Heterotheca grandiflora*), 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 16, 2017 of Powell Environmental Consultant's intent to perform the survey. This focused survey was initiated on July 2, 2017 and continued with biweekly site surveys until September 19, 2017. 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. One other 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 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. The total numbers of all insect fauna observed upon the site was lower than during the 2004, 2005, 2014, 2015, or 2016 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*) and telegraph weed (*Heterotheca grandiflora*) were observed growing along the western edge of the site.

Delhi Sands Flower-loving Fly Survey Results

Date	Time	Minutes Surveyed	Weather (at start)	Temp (°F)	Wind (mph) aver*/max
7/2/17 ¹	11:35-12:05	30	Clear	90°	0/0
7/5/17 ²	11:45-12:15	30	5% Clouds	97°	1/2
7/10/17 ²	10:40-11:10	30	5% Clouds	95°	0/1
7/13/17 ²	12:15-12:45	30	5% Clouds	94°	2/4
7/17/17 ²	11:35-12:05	30	Clear	94°	1/2
7/20/17 ²	10:30-11:00	30	Clear	87°	0/1
7/24/17 ²	11:40-12:10	30	95% Clouds	80°	2/4
7/27/17 ²	11:00-11:30	30	5% Clouds	89°	2/4
7/31/17 ²	11:45-12:15	30	10% Clouds	93°	2/4
8/3/17 ²	13:10-13:40	30	30% Clouds	96°	3/5
8/7/17 ²	11:30-12:00	30	Clear	89°	2/4
8/10/17 ²	10:40-11:10	30	Clear	90°	1/2
8/14/17 ¹	12:15-12:45	30	Clear	90°	3/5
8/16/17 ²	10:50-11:20	30	Clear	78°	0/1
8/21/17 ²	10:00-10:30	30	Clear	72°	0/1
8/24/17 ²	11:15-11:45	30	20% Clouds	81°	1/2
8/28/17 ¹	11:55-12:25	30	20% Clouds	104°	2/4
8/30/17 ¹	11:45-12:15	30	Clear	103°	2/4
9/4/17 ²	11:05-11:35	30	50% Clouds	86°	2/4
9/6/17 ¹	11:30-11:55	25	5% Clouds	89°	2/4
9/11/17 ¹	10:30-10:55	25	20% Clouds	86°	0/0
9/13/17 ¹	10:25-10:55	30	Clear	77°	1/3
9/19/17 ¹	12:55-13:20	25	40% Clouds	73°	1/3

¹ Dale Powell

² Jun Powell

³ Dale and Jun Powell

* Over a 20 second period.

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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

9/28/2017
DATE

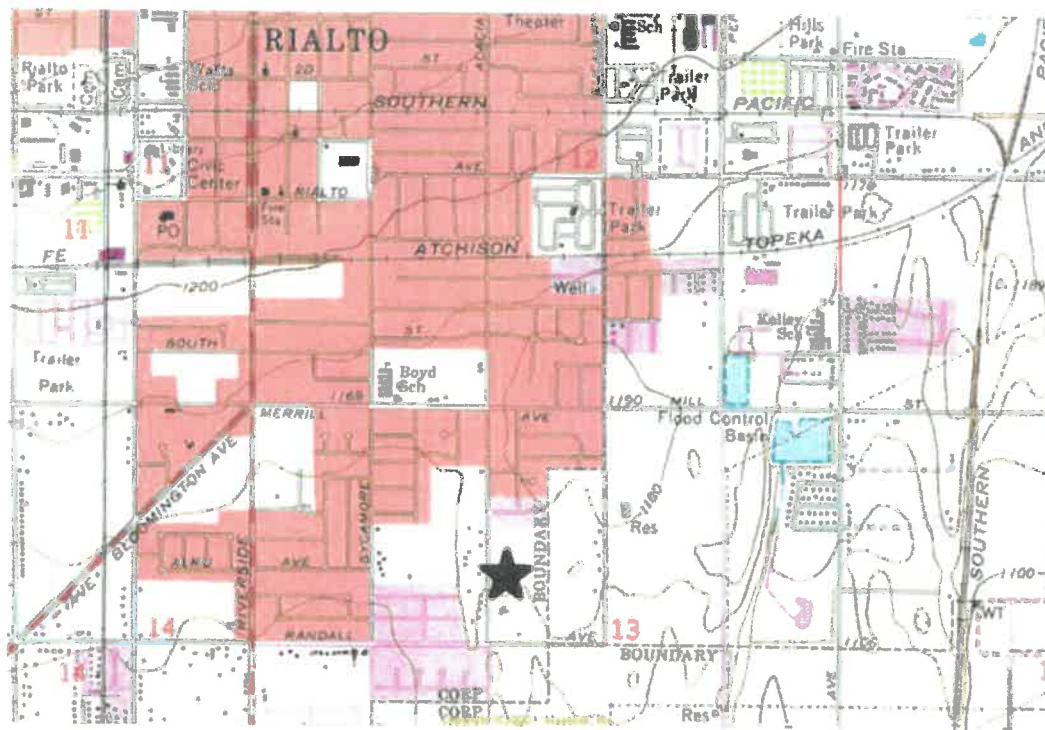
I, Jun R. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Acacia and Randall Avenues North Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

Jun R. Powell
SIGNATURE

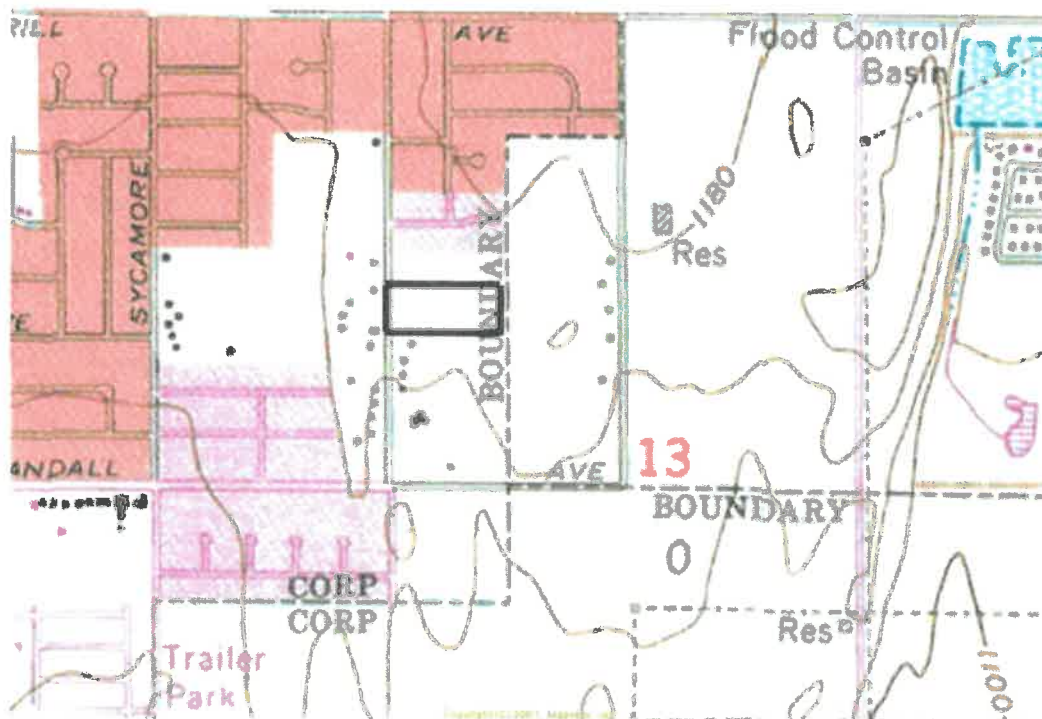
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APPENDIX

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 east from the northwestern corner.



FIELD NOTES

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: Acacia Nertin

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
7/2/12	Temp			90°				
Week	Wind			0/0				
	Weath							
7/5	Temp				97°			
Week	Wind				1/2			
	Weath				1/2 clouds			
7/10	Temp			95°				
Week	Wind			0/1				
2	Weath			1/2 clouds				
7/13	Temp				90°			
Week	Wind				2/4			
2	Weath				1/2 clouds			
7/14	Temp			94°				
Week	Wind			1/1				
	Weath			1/2 clouds				
7/20	Temp		87°					
Week	Wind		0/1					
3	Weath		clear					
	Temp			85°				
Week	Wind			1/2				
4	Weath			1/2 clouds				
7/21	Temp			85°				
Week	Wind			1/4				
	Weath			1/2 clouds				
7/23	Temp				93°			
Week	Wind				2/4			
	Weath				1/2 clouds			
8/3	Temp					96°		
Week	Wind					3/5		
5	Weath					3/4 clouds		
8/4	Temp			89°				
Week	Wind			2/4				
6	Weath			clear				
8/10	Temp			90°				
Week	Wind			1/2				
	Weath			clear				
8/14	Temp				90°			
Week	Wind				3/5			
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
8/16/17	Temp			78°				
Week	Wind			1/1				
7	Weath			cloud				
8/21/17	Temp		72°					
Week	Wind		0/1					
8	Weath		cloud					
8/24/17	Temp			81°				
Week	Wind			1/2				
8	Weath			20% cloud				
8/27/17	Temp			104°				
Week	Wind			2/4				
9	Weath			cloud				
8/30/17	Temp			104°				
Week	Wind			2/4				
9	Weath			cloud				
9/4/17	Temp			86°				
Week	Wind			2/4				
10	Weath			20% cloud				
9/15/17	Temp			81°				
Week	Wind			2/4				
10	Weath			cloud				
9/18/17	Temp		86°					
Week	Wind		0/1					
11	Weath		cloud					
9/18/17	Temp		79°					
Week	Wind		1/2					
11	Weath		cloud					
9/19/17	Temp				71°			
Week	Wind				1/2			
12	Weath				cloud			
	Temp							
Week	Wind							
	Weath							
	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]

lower-loving Fly

Dale and Jun Rong Powell

Aculeata	1	1	2/4	6	1	3/4	14																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</
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**ACACIA AND RANDALL AVENUES
POULTRY PROJECT SITE
(APN Number 0131-131-23)**

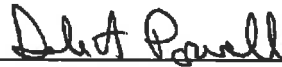
**Focused Survey for the
Delhi Sands Flower-loving Fly**

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Dale A. Powell Ph.D.
TE-006559-6

September 28, 2017

ACACIA AND RANDALL AVENUES POULTRY PROJECT SITE

Focused Survey for the Delhi Sands Flower-loving Fly

September 28, 2017

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 findings. No known previous surveys were conducted upon the site.

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.

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 Dehli 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 discing, 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 July 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 Bur-sage (*Ambrosia acanthicarpa*), and telegraph weed (*Heterotheca grandiflora*), 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 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 July 6, 2017 of Powell Environmental Consultant's intent to perform the survey. This focused survey was initiated on July 2, 2017 and continued with biweekly site surveys until September 19, 2017. 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. No members of the family Mydidae to which the Delhi Sands Flower-loving Fly belongs to or members of the closely related families, Asilidae and Apioceridae, 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. 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
7/2/17 ¹	11:05-11:35	30	Clear	88°	0/0
7/5/17 ²	12:20-12:50	30	5% Clouds	97°	1/2
7/10/17 ²	11:10-11:30	20	5% Clouds	96°	0/1
7/13/17 ²	12:45-13:05	20	5% Clouds	94°	2/4
7/17/17 ²	11:10-11:35	25	Clear	94°	1/2
7/20/17 ²	12:00-12:30	30	Clear	91°	1/2
7/24/17 ²	12:10-12:40	30	100% Clouds	78°	2/4
7/27/17 ²	10:40-11:00	20	30% Clouds	85°	0/1
7/31/17 ²	12:15-12:35	20	10% Clouds	93°	2/4
8/3/17 ²	12:50-13:10	20	30% Clouds	96°	2/4
8/7/17 ²	11:10-11:30	20	Clear	88°	1/2
8/10/17 ²	11:10-11:30	20	Clear	90°	1/2
8/14/17 ¹	11:55-12:15	20	Clear	90°	3/5
8/16/17 ²	10:30-10:50	30	Clear	76°	0/1
8/21/17 ²	10:30-10:50	20	Clear	72°	0/1
8/24/17 ²	11:45-12:05	20	20% Clouds	82°	1/2
8/28/17 ¹	11:30-12:55	25	20% Clouds	101°	1/3
8/30/17 ¹	11:25-12:45	20	Clear	102°	2/4
9/4/17 ²	11:35-11:55	20	50% Clouds	86°	2/4
9/6/17 ¹	11:05-11:30	25	10% Clouds	87°	2/4
9/11/17 ¹	10:55-11:20	25	20% Clouds	88°	0/0
9/13/17 ¹	10:00-10:25	25	Clear	76°	1/3
9/19/17 ¹	12:30-12:55	25	40% Clouds	73°	1/3

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.
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- 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.
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- 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 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

9/28/2017
DATE

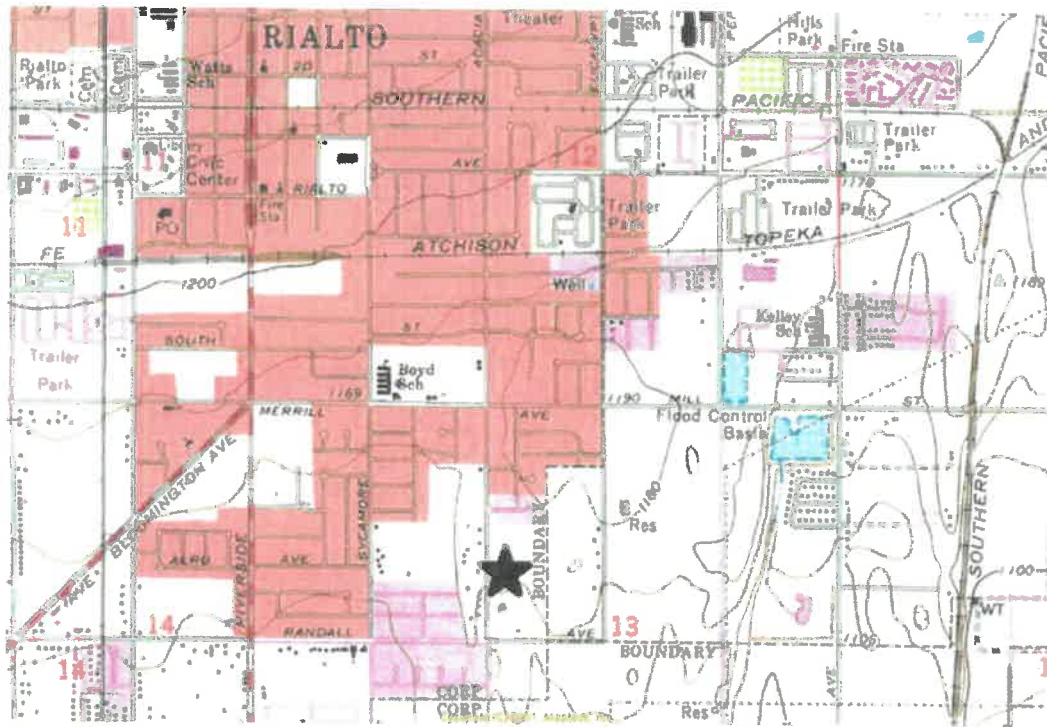
I, Jun R. Powell, having performed focused surveys for the Delhi Sands Flower-loving Fly for the Acacia and Randall Avenues Poultry Project site, Rialto, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made.

Jun R. Powell
SIGNATURE

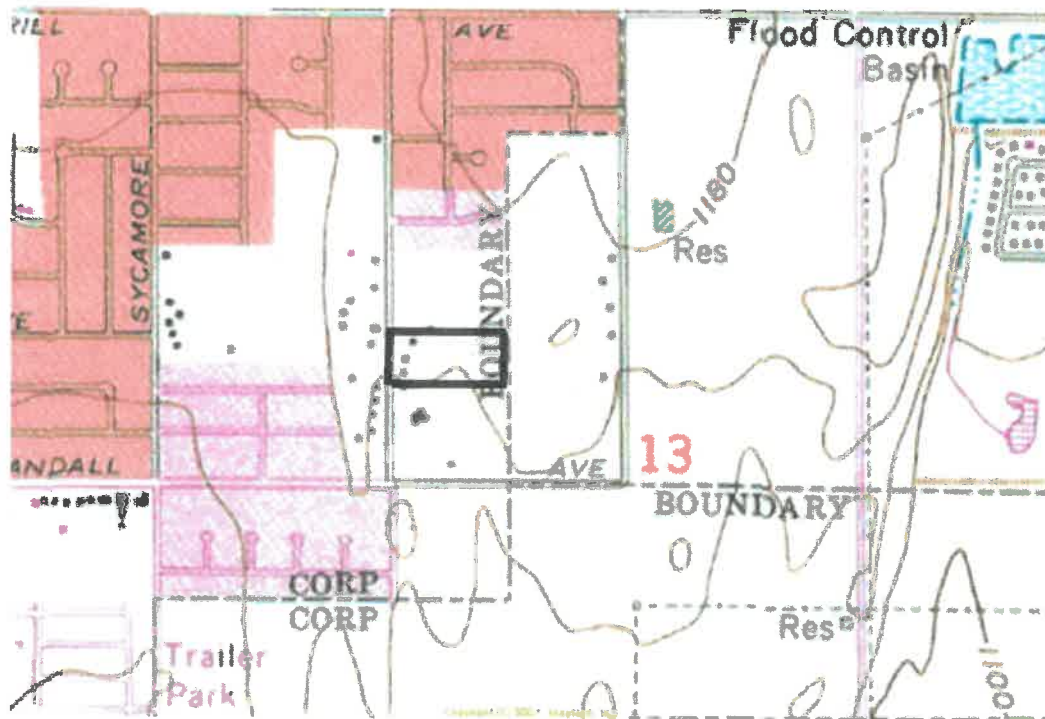
9/28/2017
DATE

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.



Picture 4. Overview of the site facing south from the north-central edge.



FIELD NOTES

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Site: Fowitry

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
7/2/17	Temp			88°				
Week	Wind			0/1				
1	Weath							
7/5	Temp				97°			
Week	Wind				1/2			
1	Weath				5% clouds			
7/10	Temp			96°				
Week	Wind			0/1				
2	Weath			5% clouds				
7/13	Temp				94°			
Week	Wind				2/4			
2	Weath				5% clouds			
7/14	Temp			94°				
Week	Wind			1/2				
2	Weath			5% clouds				
7/20	Temp				91°			
Week	Wind				1/2			
2	Weath				Clear			
7/24	Temp				90°			
Week	Wind				2/4			
4	Weath				10% clouds			
7/25	Temp		85°					
Week	Wind		0/1					
4	Weath		5% clouds					
8/3	Temp				92°			
Week	Wind				2/4			
5	Weath				10% clouds			
8/7	Temp			88°				
Week	Wind			1/2				
6	Weath			Clear				
8/10	Temp			90°				
Week	Wind			1/2				
6	Weath			Clear				
8/17	Temp				92°			
Week	Wind				2/5			
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: Pou Hry

Date		9:00	10:00	11:00	NOON	1:00	2:00	3:00
8/16/14	Temp		76°					
Week	Wind		8/11					
8	Weath		clear					
8/23/14	Temp		72°					
Week	Wind		8/11					
8	Weath		clear					
8/24/14	Temp			82°				
Week	Wind			1/2				
8	Weath			50% cloudy				
8/25/14	Temp			81°				
Week	Wind			1				
9	Weath			cloudy				
8/26/14	Temp			82°				
Week	Wind			1				
9	Weath			cloudy				
8/27/14	Temp			85°				
Week	Wind			1/4				
10	Weath			20% cloudy				
8/28/14	Temp			77°				
Week	Wind			2/4				
10	Weath			10% cloudy				
8/29/14	Temp			78°				
Week	Wind			1/2				
10	Weath			20% cloudy				
8/30/14	Temp		76°					
Week	Wind		1/2					
11	Weath		clear					
8/31/14	Temp				77°			
Week	Wind				1/2			
12	Weath				20% cloudy			
Week	Temp							
Week	Wind							
Week	Weath							
Week	Temp							
Week	Wind							
Week	Weath							
Week	Temp							
Week	Wind							
Week	Weath							

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

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

[illegible]

DP - Dale Powell
JP - Jon Powell

Delhi Sands Flower-loving Fly

Dale and Jun Rong Powell

Family	7/5	7/10	7/15	7/19	7/26	8/2	8/9	8/13	8/17	8/24	8/31	9/7	9/14	9/21	9/28
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															
Heimerobiidae															
Myrmeleontidae															
Odonata															
Aeshnidae															
Coenagrionidae															
Libellulidae															
Orthoptera															
Acrididae															
Gryllacrididae															
Gryllidae															
Mantidae															
Tettigoniidae															
OTHER															

SP Dale Powell
JP Jun Powell

Power-riding fly

Dale and Jun Rong Powell

JP - Date June 11
JP - Time 4:00

JP - Date June 11
JP - Time 4:00

Lower-loving Fly

Dale and Jun Rong Powell

JP- Dale Powell
JP- Tim Powell

JP- Dale Powell
JP- Tim Powell

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

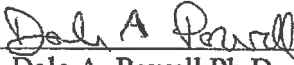
**Focused Survey for the
Delhi Sands Flower-loving Fly**

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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.
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- 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.

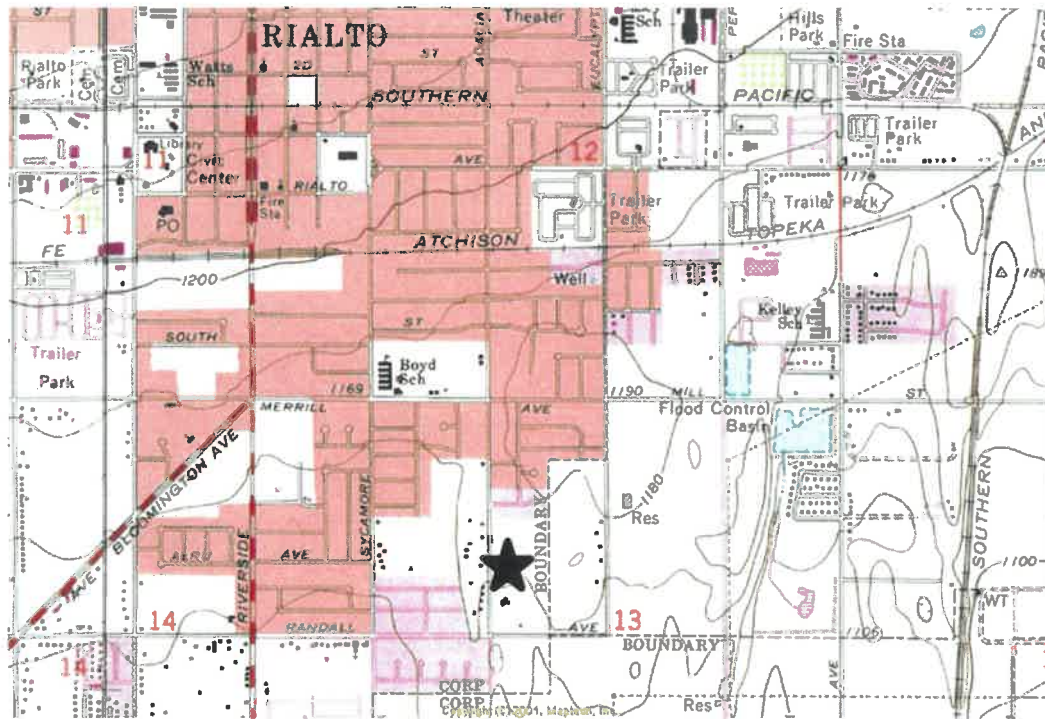
Dale A Powell 10/2/2018
SIGNATURE DATE

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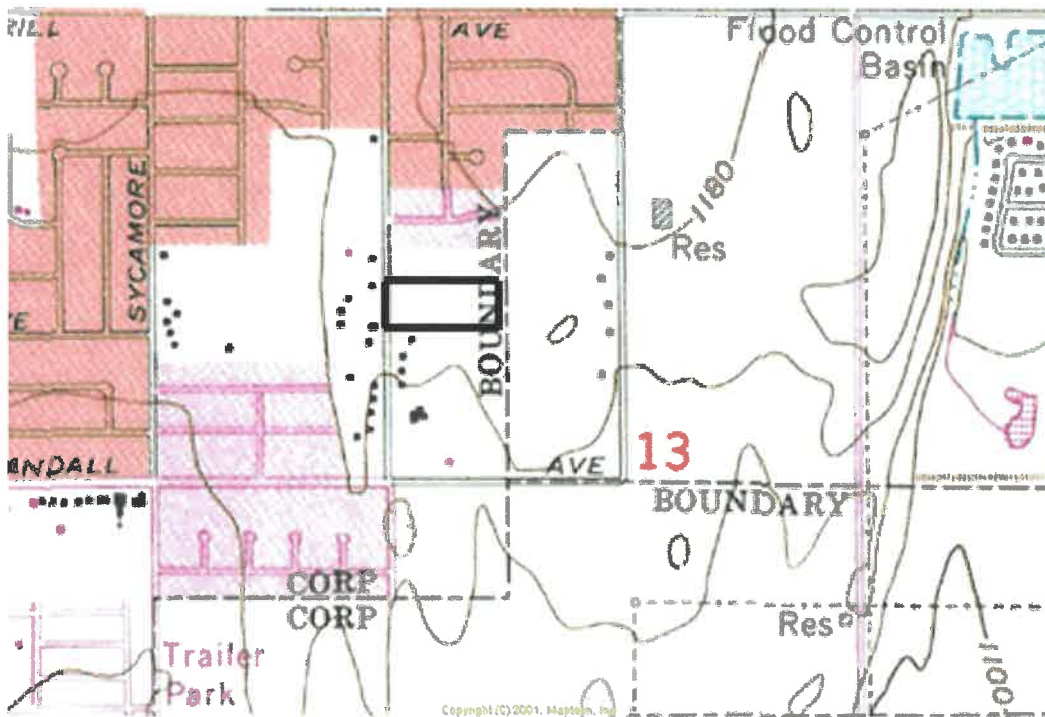
Jun R. Powell 10/2/2018
SIGNATURE DATE

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° outside			
8/1	Temp		89°					
Week	Wind		2/4					
5	Weath		clear					
8/6	Temp				99°			
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-loving Fly

Dale and Jun Kong Pown

[illegible]

lower-flying Fly

Dale and Jan KONG TOWEN

Area	North	7/10	8/9	9/3	9/5	9/10	9/12	9/17	9/17
Hymenoptera									
Anthophoridae									
Apidae	✓	✓	✓	✓	✓	✓	✓	✓	
Braconidae									
Chrysididae									
Formicidae	✓	✓	✓	✓	✓	✓	✓	✓	
Halicitidae									
Ichneumonidae									
Mutillidae									
Pompilidae									
Scoliidae									
Sphecidae	✓		✓	✓	✓	✓	✓	✓	
Vespidae			✓				✓		
Lepidoptera									
Danaidae									
Hesperiidae	✓		✓	✓	✓	✓	✓	✓	
Lycanidae	✓	✓	✓	✓	✓	✓	✓	✓	
Noctuidae									
Nymphalidae									
Papilionidae									
Pieridae	✓		✓	✓	✓	✓	✓	✓	
Pyrallidae									
Sphingidae									
Neuroptera									
Ascalaphidae									
Chrysopidae									
Hemerobiidae									
Myrmeleontidae									
Odonata									
Aeshnidae	✓								
Coenagrionidae			✓				✓	✓	
Libellulidae		✓			✓	✓	✓	✓	
Orthoptera									
Acrididae	✓			✓	✓	✓	✓	✓	
Gryllacrididae									
Gryllidae									
Mantidae									
Tettigoniidae									
OTHER									

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

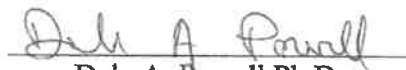
**Focused Survey for the
Delhi Sands Flower-loving Fly**

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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.
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APPENDIX

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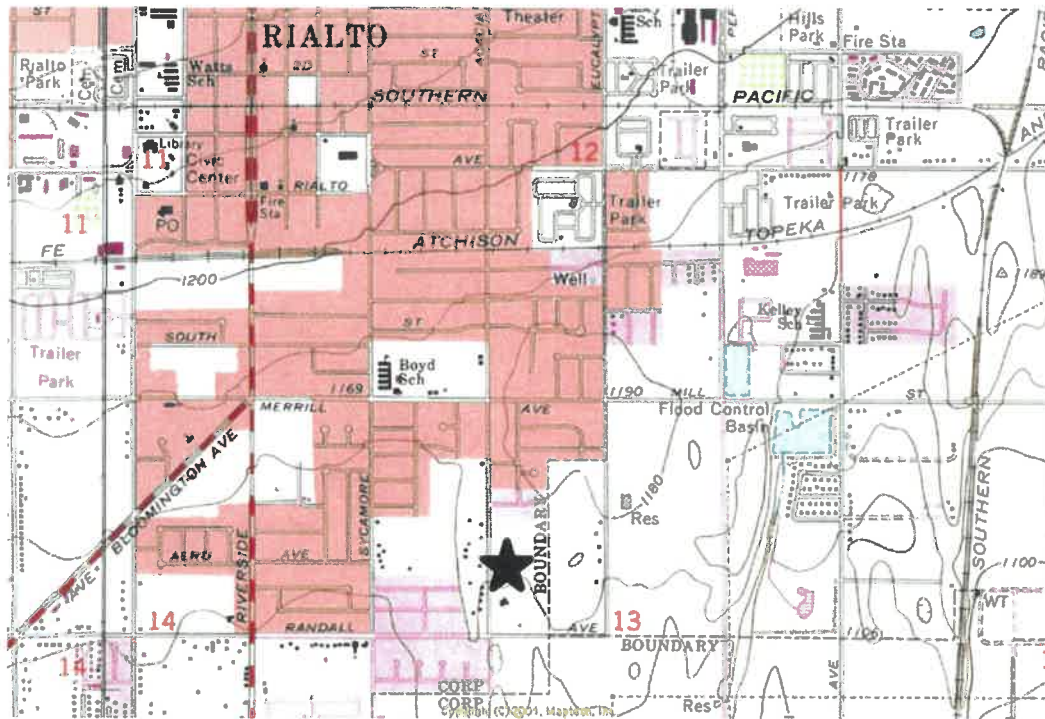
Dale A Powell 10/2/2018
SIGNATURE DATE

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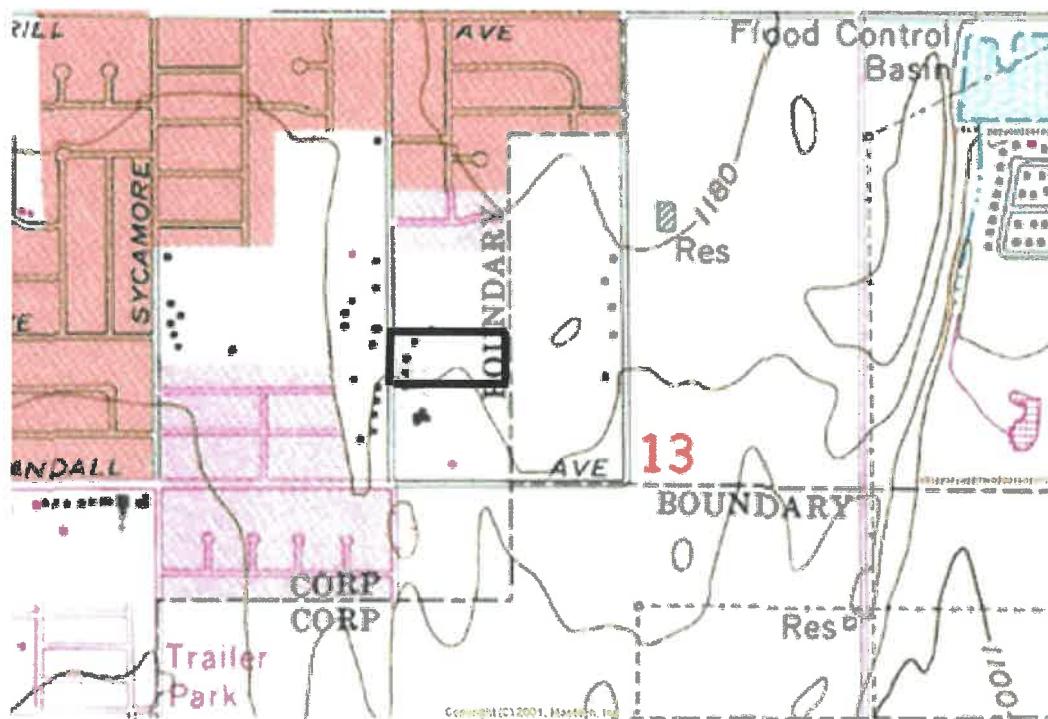
Jun R. Powell 10/2/2018
SIGNATURE DATE

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				40% 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

[illegible]

lower-loving fly

Dale and Jun Rong Powell

Family Site	3/7/12	8/6/9	9/13	9/5	9/10	9/12	9/13	9/19												
Coleoptera																				
Carabidae																				
Chrysomelidae																				
Coccinellidae																				
Curculionidae																				
Rhipiphoridae																				
Scarabaeidae		✓		✓				✓												
Tenebrionidae																				
Dermaptera																				
Diptera																				
Apioceridae																				
Asilidae																				
Bombyliidae				✓		✓	✓	✓												
Calliphoridae																				
Chironomidae																				
Conopidae																				
Muscidae	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓										
Mydidae																				
Sarcophagidae																				
Stratiomyidae																				
Syrphidae				✓																
Tabanidae																				
Tachinidae																				
Hemiptera																				
Anthocoridae																				
Lygaeidae			✓	✓																
Miridae																				
Nabidae																				
Pentatomidae																				
Reduviidae																				
Scutelleridae																				
Homoptera																				
Aphididae																				
Cercopidae																				
Cicadellidae																				
Cicadidae																				
Membracidae																				

