



July 6, 2021

Ms. Stacey Love, Recovery Permit Coordinator
United States Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

Subject: Results of the 2020–2021 Wet Season Fairy Shrimp Survey for the Boulders Mixed-Use Project (LSA Project No. TDM2101)

Dear Stacey:

This letter provides the results of a 2020–2021 wet season presence/absence survey for vernal pool branchiopods for the Boulders Mixed-Use Project site. The survey area is located at Universal Transverse Mercator (UTM) coordinates 3707445 Northing/500615 Easting within projected Section 32, Township 5 South, Range 3 West, in the City of Menifee, Riverside County, as shown on the U.S. Geological Survey (USGS) 7.5 minute series *Romoland, California* quadrangle (attached Figure 1). The survey area includes several small ponding features totaling less than 1 acre (attached Figures 2 and 3).

METHODS

The fairy shrimp survey was conducted for Riverside fairy shrimp (*Streptocephalus woottoni*) and vernal pool fairy shrimp (*Branchinecta lynchi*) by LSA Senior Biologist Stanley Spencer under LSA Federal 10(a)(1)(A) Permit TE 777965 and in accordance with the November 13, 2017, Survey Guidelines for the Listed Vernal Pool Branchiopods. Site checks were conducted on January 27, February 3, 10, and 18, March 17, 19, 22, and 28, and April 6, 2021, to determine if water was present in ponding features following storm events. Ponded features were sampled at required intervals until they had dried and remained dry.

Features were sampled by drawing a handheld net through the water column, occasionally bumping the bottom to stir up any benthic organisms. The net was periodically removed from the water to check for aquatic species.

Table A provides the dates and weather conditions for each site visit during which features were sampled. Wet season data sheets are attached.

Table A: Survey Dates, Weather Conditions, and Features Sampled

Date	Water Temperature (°C)	Air Temperature (°C)	Cloud Cover	Feature Sampled
2/3/21	18	19	0	1
2/10/21	17	18	0	2
3/17/21	14	14	2%	1, 2, 3, 4, 5, 6
3/19/21	13	16	0	1, 6
3/22/21	24	21	5%	1, 2, 3, 4, 5, 7, 8
3/29/21	17	18	1%	3

7/6/21 (R:\TDM2101\01 FS Wet\sent to client for review\FS Wet_Boulders 2021.docx)

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Features 1 and 2 filled and then dried in February, refilling along with the remaining features in March.

RESULTS AND CONCLUSIONS

Table B provides characteristics of the sampled features. Feature 1 is a broad, apparently natural, low area, made deeper by tire tracks and by ruts in a dirt road. The remaining features were artificially created. Feature 6 was created when a large boulder was extracted. The remaining features are road ruts. Water enters the features as direct rainfall and as sheet flow from adjacent compacted areas. Feature 4 is unvegetated. The other features have a mix of native and non-native, mostly hydrophytic, plants.

Table B: Characteristics of Feature Sampled

Feature	Estimated Maximum Depth (centimeters)	Estimated Maximum Length × Width (meters)	Origin	Vegetation	Fairy Shrimp Species Observed
1	15	25 × 8	natural topography, tire tracks, road ruts	<i>Amsinckia retrorsa</i> <i>Calandrinia menziesii</i> <i>Centromadia pungens</i> <i>Hirschfeldia incana</i> <i>Lepidium dictyotum</i> <i>Oncosiphon pilulifer</i> <i>Plagiobothrys leptocladus</i>	<i>Branchinecta lindahli</i>
2	15	10 × 4	road ruts	<i>Centaurea melitensis</i> <i>Centromadia pungens</i> <i>Erodium cicutarium</i> <i>Oncosiphon pilulifer</i> <i>Plagiobothrys leptocladus</i>	<i>Branchinecta lindahli</i>
3	15	10 × 1	road ruts	<i>Centromadia pungens</i> <i>Erodium cicutarium</i> <i>Hirschfeldia incana</i> <i>Oncosiphon pilulifer</i> <i>Plagiobothrys leptocladus</i>	<i>Branchinecta lindahli</i>
4	15	6 × 6	road ruts	none	<i>Branchinecta lindahli</i>
5	15	13 × 3	road ruts	<i>Amsinckia retrorsa</i> <i>Centromadia pungens</i> <i>Erodium cicutarium</i> <i>Hirschfeldia incana</i> <i>Lythrum hyssopifolia</i> <i>Oncosiphon pilulifer</i> <i>Plagiobothrys leptocladus</i> <i>Trichostema lanceolatum</i>	<i>Branchinecta lindahli</i>
6	30	6 × 4	boulder extraction	<i>Amaranthus albus</i> <i>Calandrinia menziesii</i> <i>Centromadia pungens</i> <i>Hirschfeldia incana</i> <i>Plagiobothrys leptocladus</i>	<i>Branchinecta lindahli</i>

Table B: Characteristics of Feature Sampled

Feature	Estimated Maximum Depth (centimeters)	Estimated Maximum Length × Width (meters)	Origin	Vegetation	Fairy Shrimp Species Observed
7	15	9 × 2	road ruts	<i>Centromadia pungens</i> <i>Crassula connata</i> <i>Erodium cicutarium</i> <i>Hirschfeldia incana</i> <i>Lasthenia gracile</i> <i>Lythrum hyssopifolia</i> <i>Oncosiphon pilulifer</i> <i>Plagiobothrys leptocladus</i> <i>Trichostema lanceolatum</i>	<i>Branchinecta lindahli</i>
8	15	20 × 1	road ruts	<i>Amsinckia retrorsa</i> <i>Centromadia pungens</i> <i>Erodium cicutarium</i> <i>Hirschfeldia incana</i> <i>Oncosiphon pilulifer</i> <i>Plagiobothrys leptocladus</i>	<i>Branchinecta lindahli</i>

Versatile fairy shrimp (*Branchinecta lindahli*) was observed in all features. No other invertebrate or amphibian species was observed in the features.

Please contact me if you require any additional information.

Sincerely,

LSA ASSOCIATES, INC.




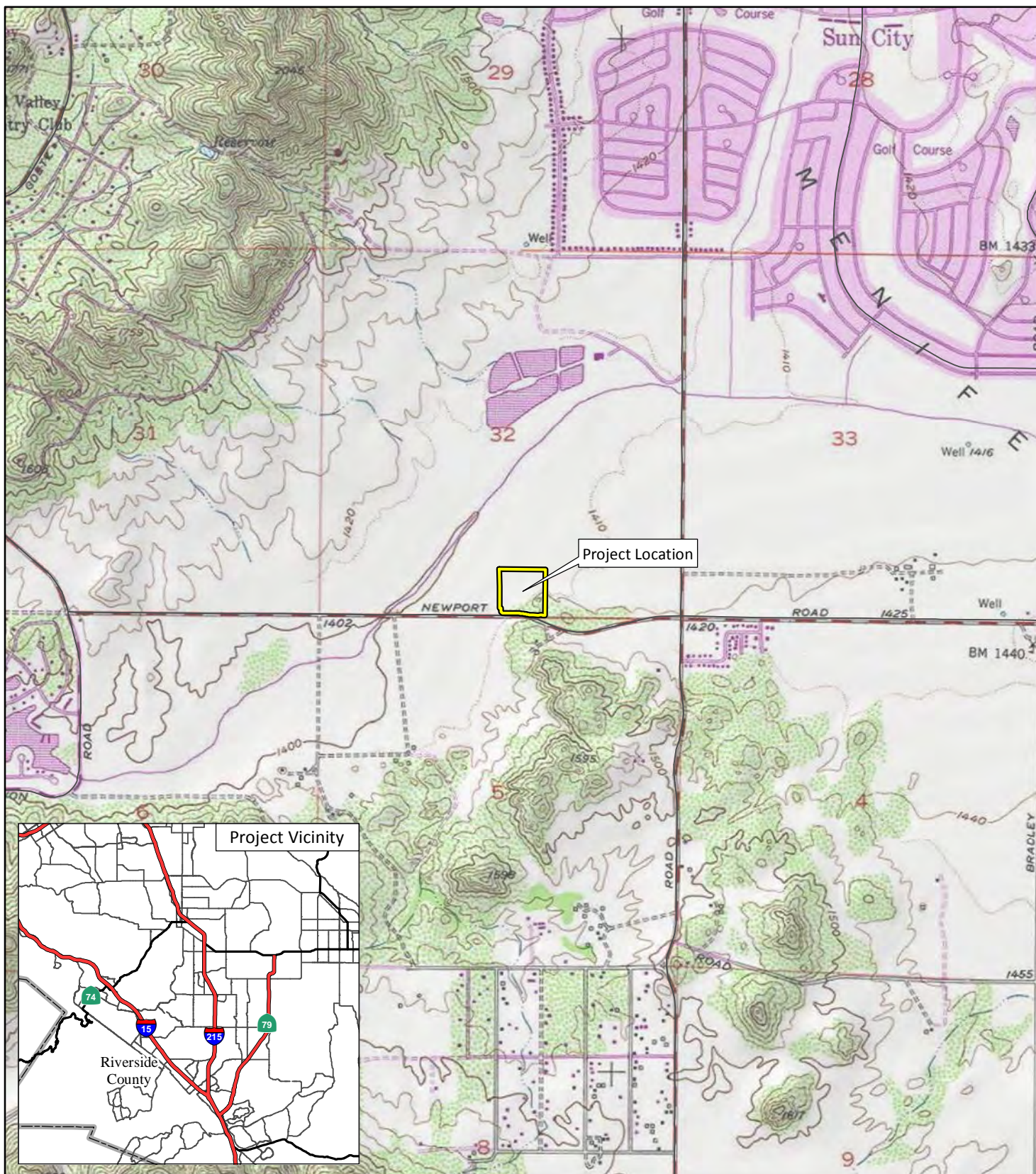
Stanley C. Spencer, Ph.D.
Associate/Senior Botanist

Attachments: Figure 1: Fairy Shrimp Survey Area
Figure 2: Feature Sampled
Figure 3: Site Photographs
Data Sheets

cc: Karin Cleary-Rose, U.S. Fish and Wildlife Service
Melody Aimar, Western Riverside County MSHCP Biological Monitoring Program

I CERTIFY THAT THE INFORMATION IN THIS SURVEY REPORT AND ATTACHED EXHIBITS FULLY AND ACCURATELY REPRESENTS MY WORK:

SURVEYOR:	PERMIT NUMBER	DATE:
 Stanley Spencer	TE-777965	July 6, 2021



LSA

LEGEND

Project Location

FIGURE 1

0 1000 2000
FEET

SOURCE: USGS 7.5' Quad - Romoland (1979), CA

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Boulders Mixed-Use Project
Project Location and Vicinity



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0 50 100
FEET

LEGEND

- Project Location
- Off-Site Work Area
- Feature Sampled
- ↖ Photograph Locations

SOURCE: Nearmap (1/14/2021)

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FIGURE 2

Boulders Mixed-Use Project
Features Sampled



Photo 1. Overview of site, facing east (11/19/20).



Photo 2. Overview of east portion of site, facing southwest (4/27/21).



Photo 3. Overview of east portion of site, facing south (4/27/21).



Photo 4. View of Feature 1, facing north (2/3/21).

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FIGURE 3

Page 1 of 2

Boulders Mixed-Use Project
Site Photographs



Photo 5. View of Feature 4, facing north (3/17/21).



Photo 6. View of Feature 6, facing north (3/17/21).



Photo 7. View of Feature 7, facing north (3/19/21).



Photo 8. View of Feature 8, facing northeast (3/22/21).

Site or Project Name:			County:	Quad:	Township:	Range:	Section:
Boulders Mixed-Use Project			RIV	Romoland	5S	3W	32
SURVEYOR / Permit Number:		Stan Spencer / TE-777965					
Date:	2/3/21	Time:	1615	Weather Conditions:	clear		

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Site or Project Name:			County:	Quad:	Township:	Range:	Section:
Boulders Mixed-Use Project			RIV	Romoland	5S	3W	32
SURVEYOR / Permit Number:		Stan Spencer / TE-777965					
Date:	2/10/21	Time:		Weather Conditions:	0% cloud cover		

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U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys for Listed Large Branchiopods

Site or Project Name:		County:	Quad:	Township:	Range:	Section:
Boulders Mixed-Use Project		RIV	Romoland	5S	3W	32
SURVEYOR / Permit Number:		Stan Spencer / TE-777965				
Date:	3/17/21	Time:	1000	Weather Conditions:	2% cloud cover	

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth (cm)		Surface Area (m × m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes/Voucher Information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomida			
1	33.6863, -117.2125 WGS84 (all)	14	14	6	15	15 × 0.3	25 × 8	BRLI										D TT	
2	33.6863, -117.2131	14	15	6	15	8 × 3	10 × 4	BRLI										D TT	
3	33.6862, -117.2130	14	18	6	15	8 × 0.6	10 × 1	BRLI										D TT	
4	33.6862, -117.2126	14	19	6	15	4 × 4	6 × 6	BRLI										D TT	
5	33.6859, -117.2135	15	21	6	15	8 × 2	13 × 3	BRLI										D TT	
6	33.6860, -117.2135	15	21	6	30	4 × 2	6 × 4											D	formed by extraction of large boulder

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = Linderiella occidentalis, BRLI = Branchinecta lindahlia). For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present. (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Site or Project Name:			County:	Quad:	Township:	Range:	Section:
Boulders Mixed-Use Project			RIV	Romoland	5S	3W	32
SURVEYOR / Permit Number:		Stan Spencer / TE-777965					
Date:	3/19/21	Time:	1615	Weather Conditions:	clear		

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*). For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present. (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys for Listed Large Branchiopods

Site or Project Name:		County:	Quad:	Township:	Range:	Section:
Boulders Mixed-Use Project		RIV	Romoland	5S	3W	32
SURVEYOR / Permit Number:		Stan Spencer / TE-777965				
Date:	3/22/21	Time:	1200	Weather Conditions:	5 % cloud cover	

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth (cm)		Surface Area (m × m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes/Voucher Information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomida			
1	33.6863, -117.2125 WGS84 (all)	21	27		15	1 × 0.5	25 × 8	BRLI										D TT	
2	33.6863, -117.2131	21	27		15	2 × 1	10 × 4	BRLI										D TT	
3	33.6862, -117.2130	21	24		15	5 × 1	10 × 1	BRLI										D TT	
4	33.6862, -117.2126	21	25		15	4 × 0.5	6 × 6	BRLI										D TT	
5	33.6859, -117.2135	21	28		15	11 × 1	13 × 3	BRLI										D TT	
7	33.6856, -117.2141	21	26		15	7 × 1	9 × 2	BRLI										D TT	
8	33.6863, -117.2128	21	25		15	1 × 0.5	20 × 1	BRLI										D TT	

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = Linderiella occidentalis, BRLI = Branchinecta lindahli). For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present. (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Site or Project Name:			County:	Quad:	Township:	Range:	Section:
Boulders Mixed-Use Project			RIV	Romoland	5S	3W	32
SURVEYOR / Permit Number:		Stan Spencer / TE-777965					
Date:	3/29/21	Time:	0920	Weather Conditions:	1% cloud cover		

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