

June 1, 2009

Ms. Sandra Marquez
U.S. Fish and Wildlife Service
Carlsbad Field Office
6010 Hidden Valley Road
Carlsbad, CA 92009

Subject: 90-Day Report for the Wet-Season Presence/Absence Survey for Vernal Pool Branchiopods Conducted on the Shinohara Parcel within the San Diego National Wildlife Refuge (SDNWR), San Diego County, California

Dear Ms. Marquez:

A wet season survey was conducted for the Shinohara Parcel of the San Diego National Wildlife Refuge (SDNWR) to determine the presence/absence of vernal pool branchiopods (fairy shrimp). The survey focused on the determination of presence for the federally listed as endangered vernal pool branchiopod species: Riverside fairy shrimp (*Streptocephalus woottoni*) and San Diego fairy shrimp (*Branchinecta sandiegonensis*), and the federally listed as threatened vernal pool fairy shrimp (*Branchinecta lynchi*). The results of the survey are discussed in this letter report.

PROJECT LOCATION

The Shinohara Parcel is located within the San Diego National Wildlife Refuge (SDNWR) in San Diego County, California. The Shinohara Parcel is approximately 700 meters south of Sweetwater Reservoir in southwestern San Diego County (Figure 1). The site is bordered by a public trail and SR-125 to the south and west. A private gated road and horse trails are located east and north of the site (Figure 2).

BACKGROUND

The Shinohara parcel is a restoration project consisting of approximately 31 acres and encompasses a portion of the "S" series of vernal pools (Bauder 1986). The appropriate soils and topography to support vernal pools occur on approximately 150 acres in the vicinity of the "S" shaped series pools. Approximately 34 vernal pools are located within the Shinohara Parcel. Of these 34, 33 have been restored and/or enhanced by Fish and Wildlife Service refuge managers in order to create suitable habitat for listed vernal pool species. The enhanced pools are in two broad clusters associated with mounded topography. Surveys were conducted in order to monitor progress of the restoration site. A previous "one-time" wet season survey was conducted during the 2008 winter season and only 1 pool (natural pool) within the site contained San Diego Fairy shrimp. No fairy shrimp species were detected in the enhanced pools.

METHODS

Notification to conduct wet season surveys for the Shinohara parcel was provided on December 16, 2008 to Sandra Marquez of the USFWS, Carlsbad Office. Surveys for vernal pool branchiopods were conducted to comply with the USFWS' *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods*.¹ As such, appropriate information including the surveyors, methodology, survey dates and times, description of habitats on-site, representative photographs, and findings of surveys conducted on all suitable habitat within the study area were collected. Surveys were performed by permitted biologist Lisa Allen (TE-050450-2) with assistance from John Martin of USFWS and biologist Suellen Lynn on December 31, 2008, January 13, and February 19, 2009. Hydrology monitoring of the ponding features began December 31, 2008, after approximately 4.63 inches of precipitation occurred. According to the California Irrigation Management Information

¹ USFWS. 1996. *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods*. April 19.

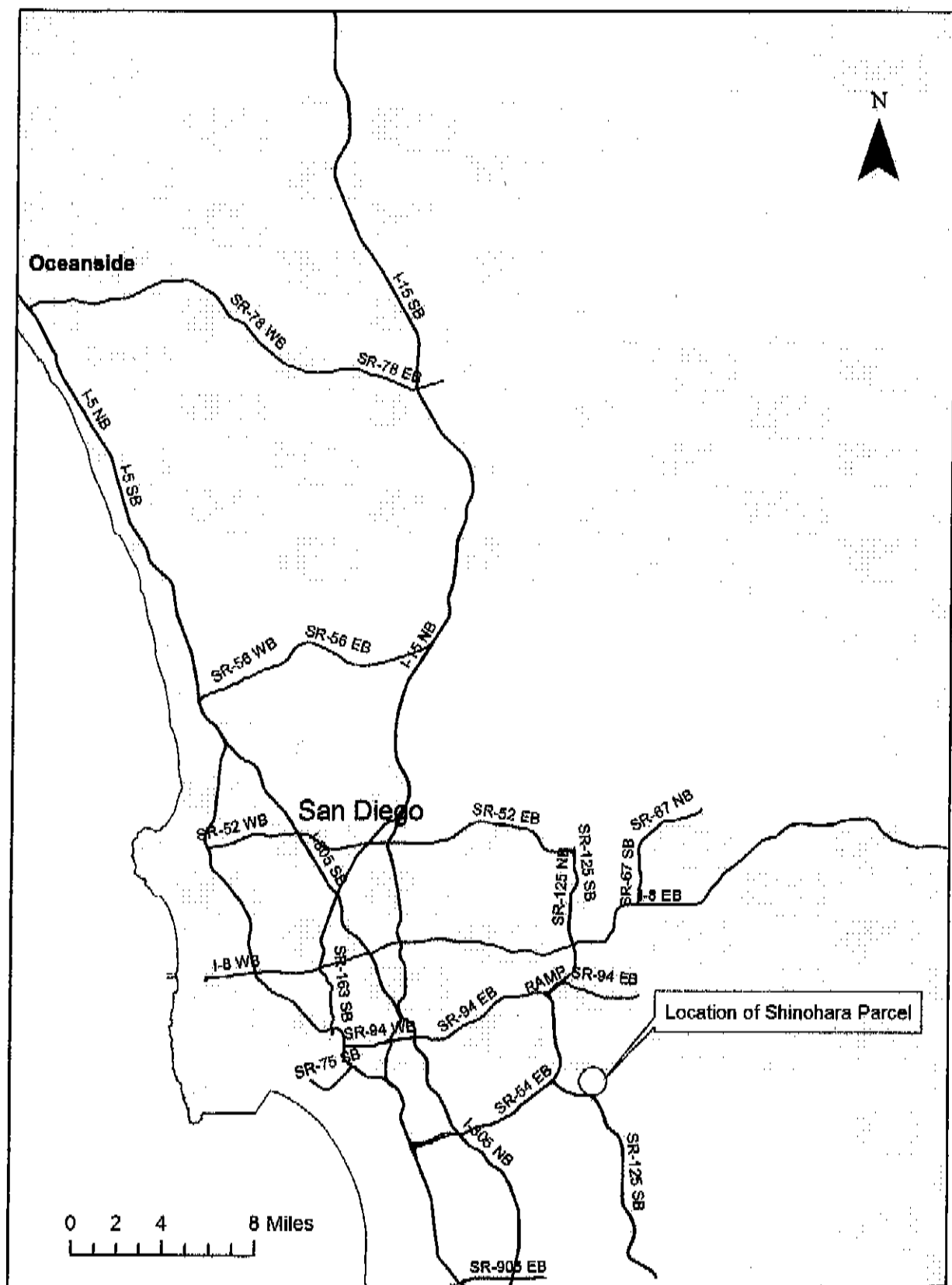




Figure 2. Shinohara Vernal Pool Complex

System (CIMIS), a total of 7.92 inches of "wet season" precipitation occurred within the area during the 2008/2009 winter season.²

During each visit, the vernal pool features were inspected for level of inundation, surface area of pool, and level of disturbance. The surveys for vernal pool species were performed with the aid of a 1 millimeter (mm) dip net, which was passed through all pools that retained water at least 3 cm deep at the time of the survey. The net passed through all portions of each of the pools from the bottom to the surface. Estimates of fairy shrimp population densities for each vernal pool feature were recorded as 10's, 100's, or 1,000's. All information was recorded on a USFWS vernal pool data sheet, which was completed for every pool that contained fairy shrimp species at the time of the survey (see attachment). Additionally, representative photographs were taken of the survey area (see attachment).

Samples were collected using the aquarium net and stored in a plastic vial with water collected from the same pool where the specimen was found; each sample was labeled with the vernal pool number. Within 24 hours, specimens were placed in a 70 percent ethyl alcohol solution. Specimens were identified to species using a 14x-90x stereo zoom microscope and dichotomous key from Dr. Denton Belk and Clyde Eriksen.³

RESULTS

Adult fairy shrimp of the *Branchinecta* genus were observed in 7 of the vernal pool features and voucher specimens were collected during the surveys. The endangered fairy shrimp (*B. sandiegonensis*) was identified in all 7 vernal pool features within the Shinohara Parcel. The endangered Riverside fairy shrimp (*S. woottoni*) and the threatened vernal pool fairy shrimp (*B. lynchi*) were not identified in any of the vernal pools. Table 1 summarizes the findings of the 2008/2009 vernal pool branchiopod wet season survey. The vernal pool locations are shown in Figure 2.

² California Irrigation Management Information System. *San Diego, Miramar, Station #150*. June 2009.

³ Eriksen, C.H. and D.Belk. *Fairy Shrimps of California's Puddles, Pools, and Playas*. 1999.

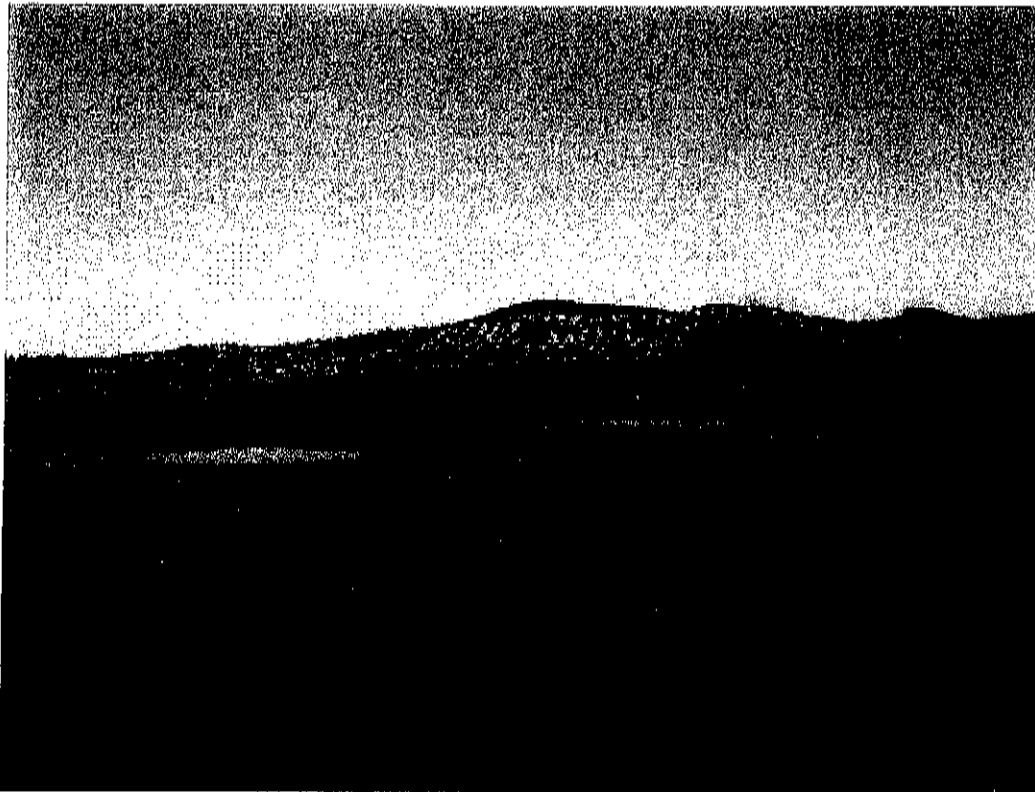


Photo1: View of Shinohara vernal pool complex.



Photo 2. Close-up of vernal pool within the Shinohara Parcel.

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ✓ yes

Date: 12 / 31 / 08 Time: 0715 County: San Diego Quad: National City

Collector(s): Lisa Allen Permit #: TE-050450-2

Site/Project Name: Shinohara Parcel- SDNWR Pool #: 34
32.68591, -116.98878

Township: — Range: — Section: — lat. — long. —

Temperature: — Water: 44.2 F °C Air: 57 F °C

Pool Depth:

Surface Area:

at time of sampling: 10 cm

at time of sampling: 7 m x 3 m

estimated maximum: 10 cm

estimated maximum: 7 m x 3 m

Habitat Condition: (circle where appropriate)

- undisturbed

disturbed: tire tracks

garbage discing/plowing

- ungrazed

grazed: cattle
light

horses sheep other
moderate heavy

- land use of habitat: Vernal Pool Preserve

(Optional) Water Chemistry Data

Alkalinity (total): — ppm or mg/l

Conductivity: — uMHO

Dissolved NH₄: — ppt or ppm Dissolved Oxygen: — ppm or mg/l

pH: — Turbidity: (secchi disc depth) — cm or: clear to bottom —

Salinity: — ppt or ppm

Total Dissolved Solids (TDS): — ppm

Notes: Pool is a natural vernal pool ~~not~~ and not manually created.

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: no ☒ yes

Required color slides and/or photographs for the project site are included: no ☒ yes

Date: 12 / 31 / 08 Time: 0745 County: SAN DIEGO Quad: National City

Collector(s): L. Allen Permit #: TE-050450-2

Site/Project Name: Shinohara Parcel - 3 SDNW12 Pool #: 4
32.68591, -116.98898
Township: _____ Range: _____ Section: _____ lat. _____ long. _____

Temperature: _____ Water: 45°F °C Air: 57°F °C

Pool Depth:

Surface Area:

at time of sampling: 8 cm

at time of sampling: 6 m x 4 m

estimated maximum: 8 cm

estimated maximum: 6 m x 4 m

Habitat Condition: (circle where appropriate)

☒ - undisturbed

disturbed: tire tracks garbage discing/plowing

☒ - ungrazed

grazed: cattle horses sheep other _____
light moderate heavy

- land use of habitat: Vernal Pool Preserve - restoration site

(Optional) Water Chemistry Data

Alkalinity (total): _____ ppm or mg/l Conductivity: _____ uMHO

Dissolved NH₄: _____ ppt or ppm Dissolved Oxygen: _____ ppm or mg/l

pH: _____ Turbidity: (secchi disc depth) _____ cm or: clear to bottom _____

Salinity: _____ ppt or ppm Total Dissolved Solids (TDS): _____ ppm

Notes:

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude
 (e.g., 10's, 100's, 1000's) *B. sandiegoneensis*

Anostracans:
 (note reproductive status)

Notostracans:
 (note reproductive status)

(Optional) Species Observations:

Cladocerans:	<u>yes</u>	no
Conchostracans:	yes	no
Copepods:	yes	no
Ostracods:	yes	no
Fish	yes	no
Frogs	yes	no
Salamanders	yes	no
Waterfowl	yes	no
Other (specify)	_____	

Insects: (adult or larvae)

Anisoptera:	yes	no
Zygoptera:	yes	no
Hydrophilidae:	yes	no
Dytiscidae:	yes	no
Corixidae:	yes	no
Notonectidae:	yes	no
Belostomatidae:	yes	no
Other (specify)	_____	

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

<u>Species</u>	<u># Individuals</u>	<u>Accession/Catalog #</u>	<u>Pool #</u>
<i>B. sandiegoneensis</i>	4 (2♂, 2♀)		VP-4

U.S. Fish and Wildlife Service Vernal Pool Data Sheet

Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: no ☐ yes ☒

Required color slides and/or photographs for the project site are included: no ☒ yes

Date: 12 / 31 / 08 Time: 0800 County: San Diego Quad: National City

Collector(s): L. Allen Permit #: TE-050450-2

Site/Project Name: Shindhara Parcel - SDNW2 Pool #: 3
 Township: — Range: — Section: — lat. 32.68597 long. -116.98893

Temperature: Water: 44°F °C Air: 57°F °C

Pool Depth:

Surface Area:

at time of sampling: 8 cm

at time of sampling: 5 m x 4 m

estimated maximum: 8 cm

estimated maximum: 5 m x 4 m

Habitat Condition: (circle where appropriate)

undisturbed	disturbed:	tire tracks	garbage	discing/plowing
ungrazed	grazed:	cattle light	horses moderate	sheep other _____ heavy

- land use of habitat: vernal pool preserve

(Optional) Water Chemistry Data

Alkalinity (total): ppm or mg/l Conductivity: uMHO

Dissolved NH_4 : _____ ppt or ppm Dissolved Oxygen: _____ ppm or mg/l

pH: _____ Turbidity: (secchi disc depth) _____ cm or: clear to bottom _____

Salinity: ppt or ppm Total Dissolved Solids (TDS): ppm

Notes:

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude
 (e.g. 10's 100's, 1000's)

B. sandiegensis

Anostracans:

(note reproductive status)

Notostracans:

(note reproductive status)

(Optional) Species Observations:

Cladocerans: yes no

Conchostracans: yes no

Copepods: yes no

Ostracods: yes no

Fish yes no

Frogs yes no

Salamanders yes no

Waterfowl yes no

Other (specify) _____

mosa. larva

Insects: (adult or larvae)

Anisoptera: yes no

Zygoptera: yes no

Hydrophilidae: yes no

Dytiscidae: yes no

Corixidae: yes no

Notonectidae: yes no

Belostomatidae: yes no

Other (specify) _____

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species

Individuals

Accession/Catalog #

Pool #

Branchinecta sandiegensis 2 ♂

VP-3

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: no ☒ yes

Required color slides and/or photographs for the project site are included: no ☒ yes

Date: 12 / 31 / 08 Time: 0815 County: San Diego Quad: National City

Collector(s): Lisa Allen Permit #: TE-050450-2

Site/Project Name: Shinohara Parcel - SDNWR Pool #: 1

Township: Range: Section: 32.68599, -116.98901
lat. long.

Temperature: Water: 47.8°F °C Air: 57°F °C

Pool Depth:

Surface Area:

at time of sampling: 20 cm

at time of sampling: 7 m x 6 m

estimated maximum: 20 cm

estimated maximum: 7 m x 6 m

Habitat Condition: (circle where appropriate)

☒ - undisturbed

disturbed: tire tracks garbage discing/plowing

☒ - ungrazed

grazed: cattle horses sheep other
light moderate heavy

- land use of habitat: Vernal Pool Preserve

(Optional) Water Chemistry Data

Alkalinity (total): ppm or mg/l

Conductivity: uMHO

Dissolved NH₄: ppt or ppm Dissolved Oxygen: ppm or mg/l

pH: Turbidity: (secchi disc depth) cm or: clear to bottom

Salinity: ppt or ppm

Total Dissolved Solids (TDS): ppm

Notes:

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude
(e.g., 10's, 100's, 1000's)

B. sandiegensis

Anostracans:

(note reproductive status)

Notostracans:

(note reproductive status)

(Optional) Species Observations:

Cladocerans:	<input checked="" type="radio"/> yes	<input type="radio"/> no
Conchostracans:	<input type="radio"/> yes	<input type="radio"/> no
Copepods:	<input checked="" type="radio"/> yes	<input type="radio"/> no
Ostracods:	<input type="radio"/> yes	<input type="radio"/> no
Fish	<input type="radio"/> yes	<input type="radio"/> no
Frogs	<input type="radio"/> yes	<input type="radio"/> no
Salamanders	<input type="radio"/> yes	<input type="radio"/> no
Waterfowl	<input type="radio"/> yes	<input type="radio"/> no
Other (specify)	_____	

Insects: (adult or larvae)

Anisoptera:	<input type="radio"/> yes	<input type="radio"/> no
Zygoptera:	<input type="radio"/> yes	<input type="radio"/> no
Hydrophilidae:	<input type="radio"/> yes	<input type="radio"/> no
Dytiscidae:	<input type="radio"/> yes	<input type="radio"/> no
Corixidae:	<input type="radio"/> yes	<input type="radio"/> no
Notonectidae:	<input type="radio"/> yes	<input type="radio"/> no
Belostomatidae:	<input type="radio"/> yes	<input type="radio"/> no
Other (specify)	_____	

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

<u>Species</u>	<u># Individuals</u>	<u>Accession/Catalog #</u>	<u>Pool #</u>
<i>B. sandiegensis</i>	4 5 ¹		VP-1

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: no ☒ yes

Required color slides and/or photographs for the project site are included: no yes

Date: 02/19/09 Time: 0900 County: San Diego Quad: National City

Collector(s): L. Allen Permit #: TE-050450-2

Site/Project Name: Shinohara Parcel - SDNWR Pool #: 2
32.68586, -116.98915
Township: - Range: - Section: - lat. - long. -

Temperature: - Water: 50°F °C Air: 50°F °C

Pool Depth:

Surface Area:

at time of sampling: 20 cm

at time of sampling: 6 m x 6 m

estimated maximum: 20 cm

estimated maximum: 6 m x 6 m

Habitat Condition: (circle where appropriate)

☒ - undisturbed

disturbed: tire tracks garbage discing/plowing

☒ - ungrazed

grazed: cattle light horses sheep other
moderate heavy

- land use of habitat: Vernal Pool Preserve

(Optional) Water Chemistry Data

Alkalinity (total): - ppm or mg/l Conductivity: - uMHO

Dissolved NH₄: - ppt or ppm Dissolved Oxygen: - ppm or mg/l

pH: - Turbidity: (secchi disc depth) - cm or clear to bottom

Salinity: - ppt or ppm Total Dissolved Solids (TDS): - ppm

Notes:

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude
 (e.g., 10's, 100's, 1000's) *Branchinecta sandiegensis*

Anostracans:
 (note reproductive status)

Notostracans:
 (note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes	no
Conchostracans:	yes	no
Copepods:	yes	no
Ostracods:	yes	no
Fish	yes	no
Frogs	yes	no
Salamanders	yes	no
Waterfowl	yes	no
Other (specify)	_____	

Insects: (adult or larvae)

Anisoptera:	yes	no
Zygoptera:	yes	no
Hydrophilidae:	yes	no
Dytiscidae:	yes	no
Corixidae:	yes	no
Notonectidae:	yes	no
Belostomatidae:	yes	no
Other (specify)	_____	

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

<u>Species</u>	<u># Individuals</u>	<u>Accession/Catalog #</u>	<u>Pool #</u>
<i>B. sandiegensis</i>	4 (2 ♂, 2 ♀)		VP-2

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: no ☒ yes

Required color slides and/or photographs for the project site are included: no ☒ yes

Date: 2 / 19 / 09 Time: 0920 County: San Diego Quad: National City

Collector(s): Lisa Allen Permit #: TE-050450-2

Site/Project Name: Shinohara Parcel - SD NW 12 Pool #: 10

Township: _____ Range: 7 Section: 7 lat. _____ long. _____

Temperature: _____ Water: 50°F °C Air: 50°F °C

Pool Depth:

Surface Area:

at time of sampling: 24 cm

at time of sampling: 7 m x 7 m

estimated maximum: 24 cm

estimated maximum: 7 m x 7 m

Habitat Condition: (circle where appropriate)

☒ - undisturbed

disturbed: tire tracks garbage discing/plowing

☒ - ungrazed

grazed: cattle horses sheep other _____
light moderate heavy

- land use of habitat: Vernal Pool Preserve - restoration site

(Optional) Water Chemistry Data

Alkalinity (total): _____ ppm or mg/l Conductivity: _____ uMHO

Dissolved NH₄: _____ ppt or ppm Dissolved Oxygen: _____ ppm or mg/l

pH: _____ Turbidity: (secchi disc depth) _____ cm or: clear to bottom _____

Salinity: _____ ppt or ppm Total Dissolved Solids (TDS): _____ ppm

Notes:

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude
 (e.g. 10's, 100's, 1000's)

Branchinecta sandiegensis

Anostracans:
 (note reproductive status)

Notostracans:
 (note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes	no
Conchostracans:	yes	no
Copepods:	yes	no
Ostracods:	yes	no
Fish	yes	no
Frogs	yes	no
Salamanders	yes	no
Waterfowl	yes	no
Other (specify) _____		

Insects: (adult or larvae)

Anisoptera:	yes	no
Zygoptera:	yes	no
Hydrophilidae:	yes	no
Dytiscidae:	yes	no
Corixidae:	yes	no
Notonectidae:	yes	no
Belostomatidae:	yes	no
Other (specify) _____		

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

<u>Species</u>	<u># Individuals</u>	<u>Accession/Catalog #</u>	<u>Pool #</u>
<i>B. sandiegensis</i>	2 (1 ♂, 1 ♀)		VP-10

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: no ☒ yes

Required color slides and/or photographs for the project site are included: no yes

Date: 2 / 19 / 09 Time: 1000 County: San Diego Quad: National City

Collector(s): Lisa Allen Permit #: TE-050450-2

Site/Project Name: Shimohara Parcel - SDNWR Pool #: 20

Township: Range: Section: 32.68364, -116.99056
lat. long.

Temperature: Water: — °C Air: — °C

Pool Depth:

Surface Area:

at time of sampling: 12 cm

at time of sampling: 13 m x 5 m

estimated maximum: 12 cm

estimated maximum: 13 m x 5 m

Habitat Condition: (circle where appropriate)

- | | | | | |
|------------------------|------------|-------------|----------|-----------------|
| - undisturbed | disturbed: | tire tracks | garbage | discing/plowing |
| - ungrazed | grazed: | cattle | horses | sheep other |
| | | light | moderate | heavy |
| - land use of habitat: | | | | |

(Optional) Water Chemistry Data

Alkalinity (total): ppm or mg/l Conductivity: uMHO

Dissolved NH₄: ppt or ppm Dissolved Oxygen: ppm or mg/l

pH: Turbidity: (secchi disc depth) cm or clear to bottom

Salinity: ppt or ppm Total Dissolved Solids (TDS): ppm

Notes:

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude
 (e.g. 10's 100's, 1000's)

Branchinecta sandiegensis

Anostracans:
 (note reproductive status)

Notostracans:
 (note reproductive status)

(Optional) Species Observations: - Jelly masses present

Cladocerans:	yes	no
Conchostracans:	yes	no
Copepods:	yes	no
Ostracods:	yes	no
Fish	yes	no
Frogs	yes	no
Salamanders	yes	no
Waterfowl	yes	no
Other (specify) _____		

Insects: (adult or larvae)		
Anisoptera:	yes	no
Zygoptera:	yes	no
Hydrophilidae:	yes	no
Dytiscidae:	yes	no
Corixidae:	yes	no
Notonectidae:	yes	no
Belostomatidae:	yes	no
Other (specify) _____		

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	<u>Accession/Catalog #</u>	<u>Pool #</u>
<i>B. sandiegensis</i>	2 (♂s)		VP-20