



2023-2024 Dry-Season & Wet-Season Branchiopod Survey 90-Day Report

Meadowview 102
(#RP-Meadowview Site-2023-1019)

City of Sacramento, California
3 September 2024

I certify that the information in this survey report and attached exhibits fully
and accurately represents my work:



Dustin Brown, 3 September 2024, Permit #TE85084C-0



Prepared for:

City of Sacramento
915 I Street, 2nd Floor
Sacramento, CA 95814

Recommended Citation:

Madrone Ecological Consulting, Inc. (Madrone). 2024. *2023-2024 Dry-Season & Wet-Season Branchiopod Survey 90-Day Report, Meadowview 102 (#RP-Meadowview Site-2023-1019)*. Prepared for the City of Sacramento, Published on 3 September 2024.

CONTENTS

**2023-2024 Dry-Season & Wet-Season
Branchiopod Survey
90-Day Report
Meadowview 102**

1.0 OBJECTIVE_____ **1**

2.0 LOCATION_____ **1**

3.0 METHODS AND MATERIALS_____ **1**

3.1 Dry-Season Survey..... **1**

3.2 Wet-Season Survey..... **2**

4.0 GENERAL SITE CONDITIONS AND HABITATS_____ **3**

5.0 FINDINGS _____ **3**

6.0 REFERENCES_____ **4**

Figures:

- Figure 1. Site and Vicinity
- Figure 2. Potential Vernal Branchiopod Habitat

Attachments:

- Attachment A. Authorization to Conduct Surveys
- Attachment B. Dry-Season Lab Data Sheets
- Attachment C. Wet-Season Data Sheets
- Attachment D. Representative Photographs

1.0 OBJECTIVE

The purpose of this report is to summarize the results of protocol-level surveys for listed large vernal pool branchiopods conducted by Madrone Ecological Consulting (Madrone) within the Meadowview 102 Project (Study Area) during the 2023-2024 dry-season and wet-season. Target species included the federally endangered conservancy fairy shrimp (*Branchinecta conservatio*) and vernal pool tadpole shrimp (*Lepidurus packardii*), as well as the federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*). Dry-season and wet-season surveys were conducted under the authority of U.S. Fish and Wildlife Service (USFWS) Recovery Permit for Dustin Brown (TE85084C-0) of Section 10(a)(1)(A) of the ESA, 16 U.S. Code 1531 et seq. and in accordance with the 13 November 2017 *Survey Guidelines for the Listed Large Branchiopods* (Guidelines) (USFWS 2017). Authorization to conduct dry-season and wet-season surveys was issued by the USFWS via e-mail to Dustin Brown on 19 October 2023 (USFWS reference number RP-Meadowview Site-2023-1219)(Attachment A).

2.0 LOCATION

The approximately 102-acre Study Area is located south of Meadowview Road in the City of Sacramento, Sacramento County, California. The Study Area is located in portions of Sections 7 and 18, Township 7 North, Range 5 East (MDB&M) of the "Florin, California" 7.5-Minute Series USGS Topographic Quadrangle (USGS 2021) (Figure 1).

3.0 METHODS AND MATERIALS

All potential large vernal pool branchiopod habitat was sampled within the Study Area. Potential habitat for federally listed large branchiopods is defined as any seasonally inundated depression that, on average, ponds water at a sufficient depth and duration for a listed large branchiopod to complete its lifecycle. Habitats that swiftly flow water (e.g., creeks, streams, and ephemeral drainages) or habitats that are semi-to-permanently inundated and support perennial populations of predators (e.g., bullfrogs, fish, and crayfish) generally do not provide suitable habitat for listed large branchiopods (USFWS 2017). **Figure 2** is an exhibit of potential branchiopod habitat within the Study Area. A total of 10.232 acres of potential branchiopod habitat was sampled including 32 seasonal wetlands and one storm water detention pond.

3.1 Dry-Season Survey

Dry soil/substrate was collected from the top 1 to 3 centimeters with a hand spade from the lowest topographic areas within each sampled feature. Wherever possible, substrate samples were collected in chunks to avoid damaging branchiopod eggs. The number and volume of soil/substrate samples collected was proportionate to the size of the sampled feature pursuant with the requirements summarized in Table 1 of the Guidelines (USFWS 2017). Soil/substrate samples were transferred to liter-sized plastic bags and marked with the project name, aquatic feature number, and collection date for transport to Madrone's laboratory. Madrone biologist Dustin Brown collected soil samples on 26 October 2023 from 32 seasonal

wetlands and one storm water detention pond in accordance with the Guidelines (USFWS 2017). Madrone senior biologist Dustin Brown processed the soil samples in the lab by stirring non-iodized salt with lukewarm tap water in a large container. Soils/substrate samples collected from each aquatic feature were individually placed into the brine solution, and manually worked by hand to reduce soil structure. Floating organic material was decanted into a 710-micron-diameter pore-size sieve stacked atop a 150-micron-diameter pore-size sieve. The soil material was processed through the top sieve by flushing it with lukewarm tap water while gently rubbing it with a soft-bristle brush. The organic material retained from the 150-micron-diameter pore-size sieve was then removed and thinly spread into plastic petri dishes.

All sieved fractions were microscopically inspected for the presence of large branchiopod eggs by Mr. Brown. Soil samples were prepared and inspected pursuant to the Guidelines (USFWS 2017) and the special terms and conditions of Mr. Brown's Take Permit (TE85084C-0).

If present, total egg abundance information for each sampled feature was reported in terms of: low abundance (estimate of 1-10 eggs/sampled feature); medium abundance (estimate of 11-50 eggs/sampled feature); and high abundance (estimate of more than 50 eggs/sampled feature).

Scanning electron micrographs of eggs (Gilchrist 1978, Hill and Shepard 1998, Mura 1991) are used to identify and compare any branchiopod eggs observed within the soil samples. Evidence of other aquatic invertebrates encountered was also noted on the lab data sheet. **Attachment B** contains the Dry-Season Lab Data Sheet, which lists sampled aquatic features.

3.2 Wet-Season Survey

Field surveys were conducted by Mr. Brown every 14 days between 12 December 2023 and 30 April 2024, in accordance with the Guidelines (USFWS 2017). All features were dry during the visits on 12 December 2023 and 30 April 2024 and no data was collected for those dates. All potential habitat was visually inspected for the presence of large vernal pool branchiopods throughout the sampling sessions. Sampling methods for inundated features were implemented as follows. All potential large vernal pool branchiopod habitat was sampled with a 3-foot-long dip net equipped with an 8-inch D-ring and 650-micron mesh. Sampling involved making a series of pulls by extending the net out and pulling it back in a sweeping motion. The net was examined for the presence of large vernal pool branchiopods and then cleaned of debris between pulls. The number of pulls made in each feature was commensurate to feature size and ponding depth. In addition, all potential habitat was visually inspected for the presence of large vernal pool branchiopods throughout the sampling sessions. Air temperature, water temperature, and hydrology/ponding were measured and recorded during the sampling sessions. **Attachment C** contains the wet-season data sheets with the above-described field data. **Attachment D** includes photos of the sampled habitats.

4.0 GENERAL SITE CONDITIONS AND HABITATS

The Study Area is located south of Meadowview Road and north of Consumnes River Boulevard and is comprised of a disturbed non-native annual brome grassland interspersed with occasional disturbed areas, and bordered to the east and west by a row of Eucalyptus trees. The Study Area is at an average elevation of approximately 12 to 18 feet above mean sea level. The property was a California Highway Patrol training academy established in 1954 and then was owned by the Federal Job Corps. Per historic aerials (Historicaerials.com) by 1964 the property was modified regularly for training purposes, including the establishment of a cantilevered track along the perimeter and frequent grading, disking and associated land modifications. This regular disturbance has continued to the present time. In 2007, a detention basin and associated ditch were excavated in the northwest corner of the Study Area. Surrounding properties include similar habitat to the west and north, a residential development to the east, and a planned residential development to the south and southeast.

The majority of the Study Area supports disturbed annual brome grasslands that are characterized by soft chess (*Bromus hordeaceus*), wild oats (*Avena fatua*), rip-gut brome (*Bromus diandrus*), and perennial rye (*Festuca perennis*). Common forbs within this community include prickly lettuce (*Lactuca serriola*), yellow star-thistle (*Centaurea solstitialis*), and alkali mallow (*Malvella leprosa*).

There are disturbed areas including the dilapidated paved roads and margins. These areas are comprised of compacted broken asphalt, earth and/or gravel and are largely unvegetated. The edges of these roads support ruderal vegetation, including stinkwort (*Dittrichia graveolens*), Russian thistle (*Salsola tragus*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), milk thistle (*Silybum marianum*), bindweed (*Convolvulus arvensis*), and broad leaf filaree (*Erodium botrys*).

The eastern and western Study Area boundaries are characterized by windbreaks comprised by mature blue gum (*Eucalyptus globulus*). The understory of this habitat is dominated by annual brome grassland species including soft chess, wild oats, rip-gut brome, and perennial rye.

Surface water in the Study Area all appears to be from natural stormwater runoff and groundwater. The paved cantilevered track along the perimeter of the Study Area has created a basin effect with a number of seasonal wetlands located in the center of the track. A storm water retention pond was installed in 2007 directing run-on from the parcel north of the Study Area into the on-site retention pond. Additionally, it appears that soil excavation has created three basins in the southern portion of the Study Area that also fill seasonally with rain water.

5.0 FINDINGS

California fairy shrimp (*Linderiella occidentals*) was identified in three features including seasonal wetlands 10 and 12 and in the large pond P-1 during both wet and dry season surveys. No listed or non-listed large branchiopods were observed within the Study Area during the 2023-2024 wet-season protocol-level

surveys. Aquatic invertebrates observed included micro-turbellaria, ostracod, Cladocera, copopoda, notonectidae, hydrophilidae dytiscidae, culicidae, collembolans, and hydracarina.

6.0 REFERENCES

- Eng, L.L., D. Belk, and C.H. Erikson. 1990. *California Anostraca: Distribution, Habitat and Status*. Journal of Crustacean Biology 10(2): 247-277.
- Eriksen, C.H., and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas*. Mad River Press, Inc., Eureka, California.
- Gilchrist, B. M. 1978. *Scanning electron microscope studies of the egg shell in some Anostraca* (Crustacea: Branchiopod). Cell Tiss. Res. 193: 337-351.
- Helm, B. P. 1999. *Feeding ecology of Linderiella occidentalis (Dodds) (Crustacea: Anostraca)*. Doctoral thesis. University of California, Davis. 158 pp.
- Hill, R. E., and W. D. Shepard. 1998. *Observation on the identification of California Anostraca cysts*. Hydrobiologia 359: 113-123.
- Mura, G. 1991. *SEM morphology of resting eggs in the species of the genus Branchinecta from North America*. J. Crust. Biol. 11: 432-436.
- Patton, S.E. 1984. *The Life History Patterns and the Distribution of Two Anostraca, Linderiella occidentalis and Branchinecta sp.* MS Thesis, California University, Chico. 50 pp.
- U.S. Geological Survey (USGS). 2021. "*Florin, California*" 7.5-Minute Series Topographic Quadrangle Map. U. S. Geological Survey. Denver, Colorado.
- U.S. Department of the Interior, Fish and Wildlife Service. 2017. *Survey Guidelines for the Listed Large Branchiopods*. Sacramento, California. Revised 13 November 2017.

Figures

Figure 1. Site and Vicinity

Figure 2. Potential Vernal Branchiopod Habitat

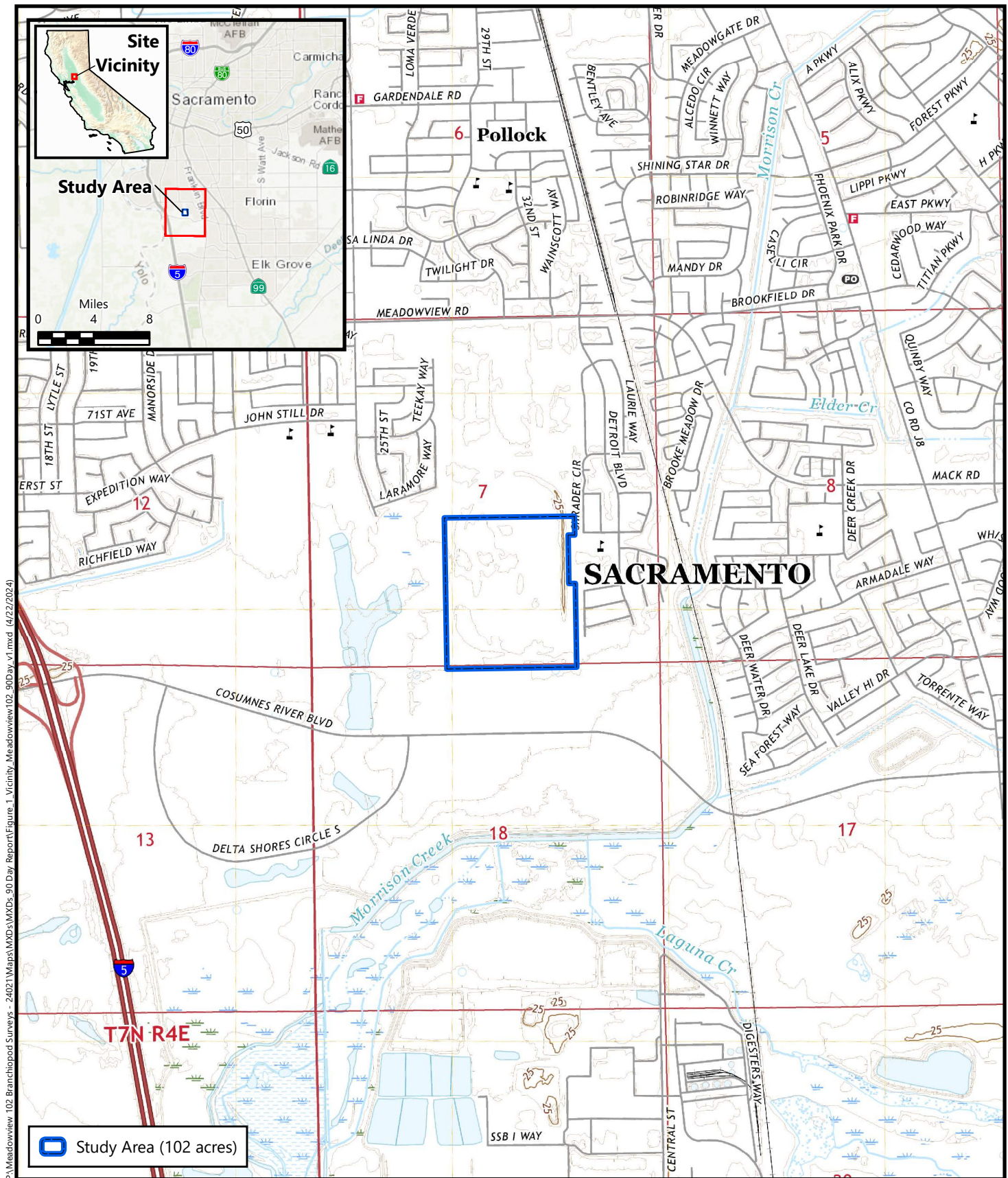


Figure 1
Site and Vicinity

Source: United States Geologic Survey, 2021
 "Florin, California" 7.5-Minute Topographic Quadrangle
 Sections 7 and 18, Township 7 North, Range 5 East, MDBM
 UTM: Easting (NAD83): 633264.8, Northing (NAD83): 4259073.5

Meadowview 102
 Sacramento County, California



P:\Meadowview 102 Branchiopod Surveys - 24021\Map1\MXD\102_90Day_Report\Figure 2_ShrimpResults_Meadowview102_90Day_v1.mxd 4/22/2024

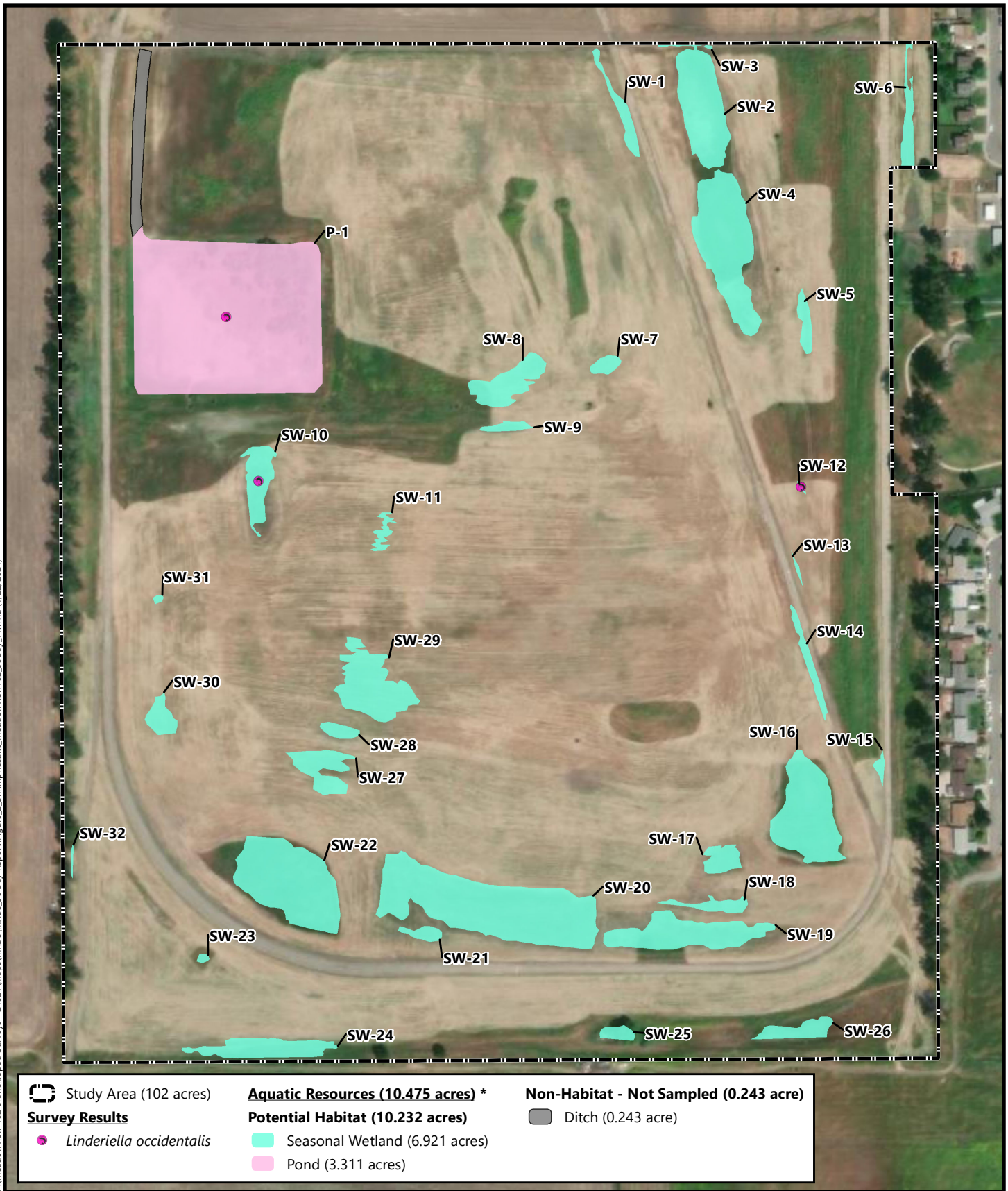


Figure 2
Potential Vernal Pool
Branchiopod Habitat

* Small summation errors may occur due to rounding
Aerial Source: Maxar, 12 April 2022

Meadowview 102
Sacramento County, California



Attachments

Attachment A. Authorization to Conduct Surveys

Attachment B. Dry-Season Lab Data Sheets

Attachment C. Wet-Season Data Sheets

Attachment D. Representative Photographs

Attachment A

Authorization to Conduct Surveys

Dustin Brown

From: SFWO Permits, FW8 <FW8_SFWO_Permits@fws.gov>
Sent: Thursday, October 19, 2023 4:12 PM
To: Dustin Brown
Cc: Cook, Megan T
Subject: Survey Approval, Multiple Sites, VpB

Dustin Brown,

By this email message, you are authorized to conduct vernal pool branchiopod surveys, as specified in your email correspondence with SFWO starting Oct. 16, Oct. 17, and Oct. 18, 2023, per the conditions of your recovery permits under Dustin Brown (TE85084C-0), Bonnie Peterson (TE205600-2), Daria Snider (TE89994B-2). Surveys will be conducted at the following:

- Village Farms Davis project site in Yolo County
- USA Rocklin project site in Placer County
- West Oaks Regional Housing project site in Placer County
- Meadowview 102 project site in Sacramento County

Please remember to carry a copy of your permit while doing the work and to follow the terms and conditions therein. This authorization does not include access to the property which must be arranged with the landowner or manager. Please let us know if the activities are not performed as authorized, or if they are done by a different permittee under a separate authorization.

Please send survey reports with their respective reference numbers:

- **RP-Village Farms-2023-1019**
- **RP- USA Rocklin-2023-1019**
- **RP-West Oaks-2023-1019**
- **RP-Meadowview Site-2023-1019**

to FW8_SFWO_Permits@fws.gov and the Sacramento Valley Division Supervisor, Megan Cook (megan_cook@fws.gov). Reports for vernal pool branchiopod surveys are due in 90 days. Reports for all other species are due in 45 days, unless otherwise specified in your permit. Reports should include, at minimum:

- 1.
2. The reference number to help ensure that we correctly record the fulfillment of the reporting requirement under this authorization,
- 2.
3. A copy of this authorization email,
- 3.
4. The names of all persons involved in each activity and their recovery permit numbers, if applicable,
5. A U.S. Geological Survey topographic map (1:24,000 scale or larger scale) depicting the location of the project site, survey area, and location(s) of species in as precise a manner as possible.

5. All other information required in the 45/90 Day Survey Report section of your permit.

Thank you,

Lauren

10(a)(1)(A) Recovery Permitting | **Sacramento Fish and Wildlife Office**

Pacific Southwest Region | U.S. Fish and Wildlife Service

Helpful Links:

[ePermits](#)

[Pacific Southwest Recovery Permitting](#)

[Minimum Qualifications](#) | [Survey Protocols](#) | [Vernal Pool Branchiopod Practical Exams](#)

We have resumed in-office vernal pool branchiopod practical exams. Please send us an email to schedule your exam.

The Sacramento Fish and Wildlife Office is using this consolidated mailbox for all communications regarding 10(a)(1)(A) recovery permits in our jurisdiction. Please send survey notifications, reports, and permit inquiries to this email address:

FW8_SFOW_Permits@fws.gov.

Attachment B

Dry-Season Lab Data Sheet

Dry Season Lab Data Sheet																
Project Information							Biologist Information									
Project Name: Meadowview 102				Quad: Florin, CA			Name of Person(s) Who Conducted the Following Tasks and Permit Number(s):									
USFWS Project Number: RP-Meadowview Site-2023-1219							Soil Collection Conducted By: D. Brown									
County: Sacramento				Range: 5 East			Soil Processing Conducted By: D. Brown									
Lat:				Section: 7 and 18			Soil Analysis/Cysts ID Conducted By: D. Brown									
Long:							Soil Collection Date: 10/26/2024					Soil Processing Date: 11/17/2023, 12/6, 7, and 8/2023. 1/16/2024				
Feature Number	Invertebrates Present (X)														Comments	
	Insect Exo-Skeletons	Micro-Tubellaria Cysts	Cladocera ephippia	Cladocera Live/Cysts/Carapaces	Ostracods Live/Cysts/Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Eggs					Hydracarina Live	Nematoda	Collembola		Other Species
							Branchinecta sp.	Lepidurus packardii	Lindieriella occidentalis	Lynceus brachyurus	Cyzicus californicus					
SW-1	X	X	X	X										X	rotifer	1 liter soil, 6 plates
SW- 2	X		X	X												2 liters soil, 11 plates
SW- 3	X	X		X												1 liter soil, 6 plates
SW- 4	X		X	X									X	rotifer		2 liters soil, 10 plates
SW- 5	X		X	X												1 liter soil, 7 plates
SW- 6	X	X	X	X										rotifer		1 liter soil, 5 plates
SW- 7	X	X		X										rotifer		1 liter soil, 6 plates
SW- 8	X	X		X												1 liter soil, 5 plates
SW- 9	X	X		X												1 liter soil, 7 plates
SW- 10	X		X	X				55 eggs					X	rotifer		1 liter soil, 5 plates
SW- 11	X			X									X	rotifer		1 liter soil, 4 plates
SW- 12	X		X	X				25 eggs					X			1 liter soil, 5 plates
SW- 13	X			X									X	rotifer		1 liter soil, 4 plates
SW- 14	X	X	X	X									X			1 liter soil, 4 plates
SW- 15	X			X									X	rotifer		1 liter soil, 7 plates
SW- 16	X		X	X												2 liter soil, 12 plates
SW- 17	X	X	X	X												1 liter soil, 4 plates
SW- 18	X			X										rotifer		1 liter soil, 7 plates
SW- 19	X	X	X	X										rotifer		2 liters soil, 13 plates
SW- 20	X	X	X	X									X	rotifer		3 liters soil, 17 plates
SW- 21	X	X	X	X												1 liter soil, 7 plates
SW- 22	X		X	X												3 liters soil, 15 plates
SW-23	X			X									X			1 liter soil, 7 plates
SW-24	X	X	X	X									X	rotifer		2 liters soil, 13 plates
SW-25	X	X		X										rotifer		1 liter soil, 4 plates
SW-26	X	X	X	X												1 liter soil, 4 plates
SW-27	X	X	X	X										rotifer		1 liter soil, 6 plates
SW-28	X		X	X										rotifer		1 liter soil, 6 plates
SW-29	X		X	X												2 liters soil, 11 plates
SW-30	X	X	X	X									X	rotifer		1 liter soil, 7 plates
SW-31	X			X												1 liter soil, 7 plates
SW-32	X	X		X									X	rotifer		1 liter soil, 6 plates
Pond 1	X	X	X	X				67 eggs						rotifer		4 liters soil, 17 plates

Attachment C

Wet-Season Data Sheets

**MADRONE
ECOLOGICAL
CONSULTING**

Project Name: <i>Meadowview 102</i>		 ECOLOGICAL CONSULTING	
Survey Date: <i>12/28/2023</i>	Weather Conditions: <i>Mostly cloudy</i>		Permit #:
Start Time: <i>1345</i>	Start Air Temperature (°C): <i>60°F</i>		Permitted Biologist: <i>D. Brown</i>
End Time: <i>1505</i>	End Air Temperature (°C): <i>62°F</i>		Assisted By: <i>-</i>

[illegible]

X = species present, Large Branchiopods abundance = (1's, 10's, 100's, 1000's) **NAIO = No Aqratic Invertebrates Observed**

**MADRONE
ECOLOGICAL
CONSULTING**

[illegible]

Wet Season Survey Data Sheet


MADRONE
ECOLOGICAL
CONSULTING

 Project Name: Meadowview 102

 Survey Date: 2/8/2024

 Weather Conditions: Overcast, 0-3 mph

Permit #:

 Start Time: 1455

 Start Air Temperature (°F): 52°F

 Permitted Biologist: D. Brown

 End Time: 1735

 End Air Temperature (°F): 50°F

 Assisted By: —

Feature No.	Water Temperature (°C)	Present Ponded Depth (cm)	Current % Surface Area	Micro-Turbellaria	Crustacea							Insecta										Gastropoda	Hydracini	Herps		Habitat Condition			Land Use									
					Amphipoda	Cladocera	Copepoda	Ostracoda	Large Branchiopods						Coleoptera			Diptera		Ephemeroptera	Hemiptera			Odonata		Bufo boreas	Pseudacris sierra	Undisturbed	Disturbed			Fallow	Agriculture	Grazed				
									BRLY	BRME	CYCA	LEPA	LIOC	LYBR	Dytiscidae	Hydrophilidae	Halipidae	Chironomidae	Culicidae		Corixidae			Notonectidae	Limnephilidae				Zygoptera	Anisoptera	Tire Ruts			Garbage	Plowed or Disked	Light	Moderate	Heavy
P-1		40+	100	X		X	X	X				100's	X					X							X		X											
SW-1		15	100																										X									
2		29	100																											X								
4		28	100																											X								
5		17	100																											X								
6		29	100																											X	X							
7		12	90																											X								
8		15	80																											X								
10		19	100									100's																		X								
30		11	90																											X								
29		9	90																											X								
28		14	100	NAIO																										X								
27		10	100																											X								
32		8	100	NAIO																										X								
22		40+	90																											X								
23		12	100																											X								
24		10	100	NAIO																										X								
20		14	40																											X	X							
26		20	100																											X								
19		18	40																											X	X							
17		20	100																											X								
16		29	100																											X								
14		6	80																								X	X	X									
12		15	100									100's																X		X								

 Large Branchiopods: BRLY = *Branchinecta lynchi*, BRME = *Branchinecta mesovallensis*, LIOC = *Linderiella occidentalis*, LEPA = *Lepidurus packardii*, CYCA = *Cyzicus californicus*, LYBR = *Lyneceus brachyurus*

Land Use: Grazed (C = cattle, H = horse, S = sheep, O = other)

Hydrology: S = saturated, N/P = not ponded

X = species present, Large Branchiopods abundance = (1's, 10's, 100's, 1000's)

Wet Season Survey Data Sheet


MADRONE
ECOLOGICAL
CONSULTING
Project Name: Meadowview 102Survey Date: 2/21/2024Weather Conditions: Mostly cloudy, 10 mph

Permit #:

Start Time: 1300Start Air Temperature (°C): 13Permitted Biologist D. BrownEnd Time: 1545End Air Temperature (°C): 12Assisted By: -

Feature No.	Water Temperature (°C)	Present Ponded Depth (cm)	Current % Surface Area	Micro-Turbellaria	Crustacea										Insecta										Gastropoda	Hydracaini	Herps		Habitat Condition			Land Use						
					Amphipoda	Cladocera	Copepoda	Ostracoda	Large Branchiopods							Coleoptera			Diptera		Ephemeroptera	Hemiptera		Odonata			Bufo boreas	Pseudacris sierra	Undisturbed	Disturbed		Fallow	Agriculture	Grazed				
									BRLY	BRME	CYCA	LEPA	LIOC	LYBR	Dytiscidae	Hydrophilidae	Halipidae	Chironomidae	Culicidae	Corixidae		Notonectidae	Limnephiliidae	Zygoptera						Anisoptera	Tire Ruts			Garbage	Plowed or Disked	Light	Moderate	Heavy
SW-16	14	25	80			X	X							X	X														X		X							
15	11	9	100	X		X	X	X																					X		X							
14	13	19	100	X		X									X														X		X							
13	14	14	100	X		X																							X		X							
12	12	19	100	X		X	X	X																								X						
5	12	8	5	X				X							X																	X						
2	13	25	50	X				X							X				X													X						
6	11	13	20	X				X																														
3	11	11	100	N/A																																		
1	12	10	100	X									10's		X							X																
7	10	9	50	X				X							X																							
P-1	11	35	60	X		X	X	X					1,000's								X																	
SW-21	13	11	20	X																																		
20	12	10	1	X											X																							
10	11	19	45	X		X	X						10's		X						X																	

Large Branchiopods: BRLY = *Branchinecta lynchi*, BRME = *Branchinecta mesoallensis*, LIOC = *Linderiella occidentalis*, LEPA = *Lepidurus packardii*, CYCA = *Cyzicus californicus*, LYBR = *Lynceus brachyurus*

Land Use: Grazed (C = cattle, H = horse, S = sheep, O = other)

Hydrology: S = saturated, N/P = not ponded

X = species present, Large Branchiopods abundance = (1's, 10's, 100's, 1000's)

Wet Season Survey Data Sheet


MADRONE
ECOLOGICAL
CONSULTING
Project Name: Meadowview 102Survey Date: 3/6/2024Weather Conditions: Overcast, 1-3 mph

Permit #:

Start Time: 1330 hrsStart Air Temperature (°C): 16Permitted Biologist D. BrownEnd Time: 1800 hrsEnd Air Temperature (°C): 17Assisted By: —

Feature No.	Water Temperature (°C)	Present Ponded Depth (cm)	Current % Surface Area	Micro-Turbellaria	Crustacea										Insecta												Gastropoda	Hydracaini	Herps		Habitat Condition			Land Use				
					Amphipoda	Cladocera	Copepoda	Ostracoda	Large Branchiopods						Coleoptera			Diptera		Ephemeroptera	Hemiptera		Odonata		Bufo boreas	Pseudacris sierra			Undisturbed	Disturbed		Fallow	Agriculture	Grazed				
									BRLY	BRME	CYCA	LEPA	LIOC	LYBR	Dytiscidae	Hydrophilidae	Halipidae	Chironomidae	Culicidae		Corixidae	Notonectidae	Limnephiliidae	Zygoptera						Anisoptera	Tire Ruts			Garbage	Plowed or Disked	Light	Moderate	Heavy
SW-16	15	20	70	X		X		X						X	X														X	X								
14	14	15	70	X		X									X		X												X	X								
13	16	11	70	X		X									X														X	X								
12	17	16	80	X		X	X	X						X	X																X							
2	14	19	30	X				X							X																X							
6	15	10	10	X			X	X							X																	X						
3	15	7	70	X				X							X																	X						
1	16	4	50	X			X	X					100's		X																	X						
21	17	9	10	X																												X						
20	20	5	1	X	X			X							X																	X						
10	19	10	30	X									100's		X																	X						
P-1	17	30	60	X		X	X						1,000's		X							X									X							
SW-4	17	10	80	X		X	X	X						X	X							X										X						

Large Branchiopods: BRLY = *Branchinecta lynchi*, BRME = *Branchinecta mesoatlantica*, LIOC = *Linderiella occidentalis*, LEPA = *Lepidurus packardii*, CYCA = *Cyzicus californicus*, LYBR = *Lyneceus brachyurus*

Land Use: Grazed (C = cattle, H = horse, S = sheep, O = other)

Hydrology: S = saturated, N/P = not ponded

X = species present, Large Branchiopods abundance = (1's, 10's, 100's, 1000's)



**MADRONE
ECOLOGICAL
CONSULTING**

Project Name: Meadow 102

Survey Date: 3/20/2024 Weather Conditions: mostly cloudy

Permit #:

Start Time: 1330

Start Air Temperature (°C): 8 5-8 mph

Permitted Biologist D. Brown

End Time: 1530

End Air Temperature (°C): 9

Assisted By: _____

[illegible]

Large Branchiopods: BRLY = *Branchinecta lynchi*, BRME = *Branchinecta mesoallensis*, LIOC = *Linderiella occidentalis*, LEPA = *Lepidurus packardii*, CYCA = *Cyzicus californicus*, LYBR = *Lyceus brachyurus*

Land Use: Grazed (C = cattle, H = horse, S = sheep, O = other)

Hydrology: S = saturated, N/P = not ponded

X = species present, **Large Branchiopods abundance** = (1's, 10's, 100's, 1000's)

Wet Season Survey Data Sheet



**MADRONE
ECOLOGICAL
CONSULTING**

Project Name: Meadowview 102

Survey Date: 4/2/2024

Weather Conditions: Clear, 8-12 mph

Permit #:

Start Time: 13:30 hrs

Start Air Temperature (°C): 22

Permitted Biologist D. Brown

End Time: 15:00 hrs

End Air Temperature (°C): 24

Assisted By: _____

[illegible]

Large Branchiopods: BRLY = *Branchinecta lynchi*, BRME = *Branchinecta mesovallensis*, LIOC = *Linderiella occidentalis*, LEPA = *Lepidurus packardii*, CYCA = *Cyzicus californicus*, LYBR = *Lyceus brachyurus*

Land Use: Grazed (C = cattle, H = horse, S = sheep, O = other)

Hydrology: S = saturated, N/P = not ponded

X = species present, **Large Branchiopods abundance** = (1's, 10's, 100's, 1000's)

**MADRONE
ECOLOGICAL
CONSULTING**

Survey Date: 4/16/2024

Weather Conditions: Partly Cloudy, 1-5 mph

Permit #:

Start Time: 0900

Start Air Temperature (°C): 56°F

Permitted Biologist : D. Brown

End Time: 1129

End Air Temperature (~~°C~~): 64° F

Assisted By: _____

[illegible]

Land Use: Grazed (C = cattle, H = horse, S = sheep, O = other)

Hydrology: S = saturated, N/P = not ponded

X = species present, **Large Branchiopods abundance** = (1's, 10's, 100's, 1000's)

Attachment D

Representative Photographs



SW-20 west on 26 October 2023.



SW-26 facing east on 26 October 2023.



SW-23 facing west on 26 October 2023.



P-1 facing southeast on 26 October 2024.



SW-6 facing south on 26 October 2023.



SW-16 facing southeast on 25 January 2024.



SW14 facing north on 25 January 2024.



P-1 facing northwest on 25 January 2024.



SW-22 facing southeast on 25 January 2024.



SW-25 facing southeast on 25 January 2024.



SW-17 facing southwest on 16 April 2024.



SW-16 facing southwest on 16 April 2024.