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Project Title:	Vaca Dixon Power Center Project
TN #:	271731
Document Title:	Protocol-Level Wet Season Sampling for Federally-Listed Branchiopods
Description:	N/A
Filer:	Adam Morrison
Organization:	Rincon Consultants, Inc.
Submitter Role:	Applicant Consultant
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July 14, 2026
CEC Docket No: 26-OPT-01

Jon Boyer
Vaca Dixon BESS LLC and Arges BESS LLC
4350 Executive Drive, Suite 320
San Diego, California 92121

**Subject: Vaca Dixon Power Center Project, Protocol-Level Wet Season Sampling for Federally-Listed Branchiopods
City of Vacaville, California**

The attached Wet Season Sampling Report for Federally Listed Large Branchiopods was prepared to support the Vaca Dixon BESS LLC and Arges BESS LLC (Applicants) California Energy Commission Opt-In Application for the Vaca Dixon Power Center Project (Project) in the City of Vacaville.

The report includes results of surveys conducted between October 24, 2025 and May 8, 2026 at the portion of the Project Area south of Interstate-80 (I-80), where the battery energy storage system facilities are proposed. Protocol- Level Dry and Wet Season Sampling Reports for Federally Listed Large Branchiopods specific to the portion of the Project Area north of I-80, where the overhead transmission intertie lines are proposed, were included as appendices to the Project Biological Resources Technical Report, submitted to the CEC docket on January 6, 2026 (TN 268172-1, TN 268172-2, TN 268172-3).

Sincerely,
Rincon Consultants



Adam Morrison
Senior Environmental Planner

Attachments

Attachment 1 Wet Season Sampling Report for Federally Listed Large Branchiopods

Attachment 1

Wet Season Sampling Report for Federally Listed Large Branchiopods

**PROTOCOL-LEVEL
WET-SEASON SAMPLING
FOR
FEDERALLY-LISTED LARGE BRANCHIOPODS
AT THE
VACA DIXON POWER CENTER PROJECT,
SOLANO COUNTY, CALIFORNIA**



RINCON CONSULTANTS, INC.
4825 J Street #200
Sacramento, CA 95819
Contact: Thea Benson
(831) 824-6871



HELM BIOLOGICAL CONSULTING
4600 Karchner Road
Sheridan, CA 95681
Contact: Dr. Brent Helm
(530) 633-0220

June 2026

**PROTOCOL-LEVEL
WET-SEASON SAMPLING
FOR
FEDERALLY-LISTED LARGE BRANCHIOPODS
AT THE
VACA DIXON POWER CENTER PROJECT,
SOLANO COUNTY, CALIFORNIA**

INTRODUCTION

Helm Biological Consulting (HBC), a division of Tansley Team, Inc., was contracted by Rincon Consultants, Inc. to conduct protocol-level wet-season sampling for large branchiopods (fairy shrimp, tadpole shrimp, and clam shrimp) that are listed as threatened or endangered under the federal Endangered Species Act (ESA) (e.g., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]) at the Vaca Dixon Power Center Project (hereafter “Project”).

The Project consists of roughly 10 acres is located on the south side of Interstate 80, just south of the Vaca Dixon Substation, Solano County, California (Figure 1). Additionally, the Project is located within the southwest $\frac{1}{4}$ of the northeast $\frac{1}{4}$ of Section 1, Township 6 North, Range 1 West, and Mount Diablo Base and Meridian of the Allendale 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle map; approximate center coordinates in decimal degrees (North American Datum [NAD83]) are: 38.396143, -121.921524 (Figure 1).

The remainder of this report discusses the methods and results of the 2025/2026 wet-season sampling for the presence of federally-listed large branchiopods at the Project.



“I certify that the information in this survey report fully and accurately represents my work.”

Brent P. Helm
(TE-795930-12)

Signature *Brent Helm*

Date 06-6-2026

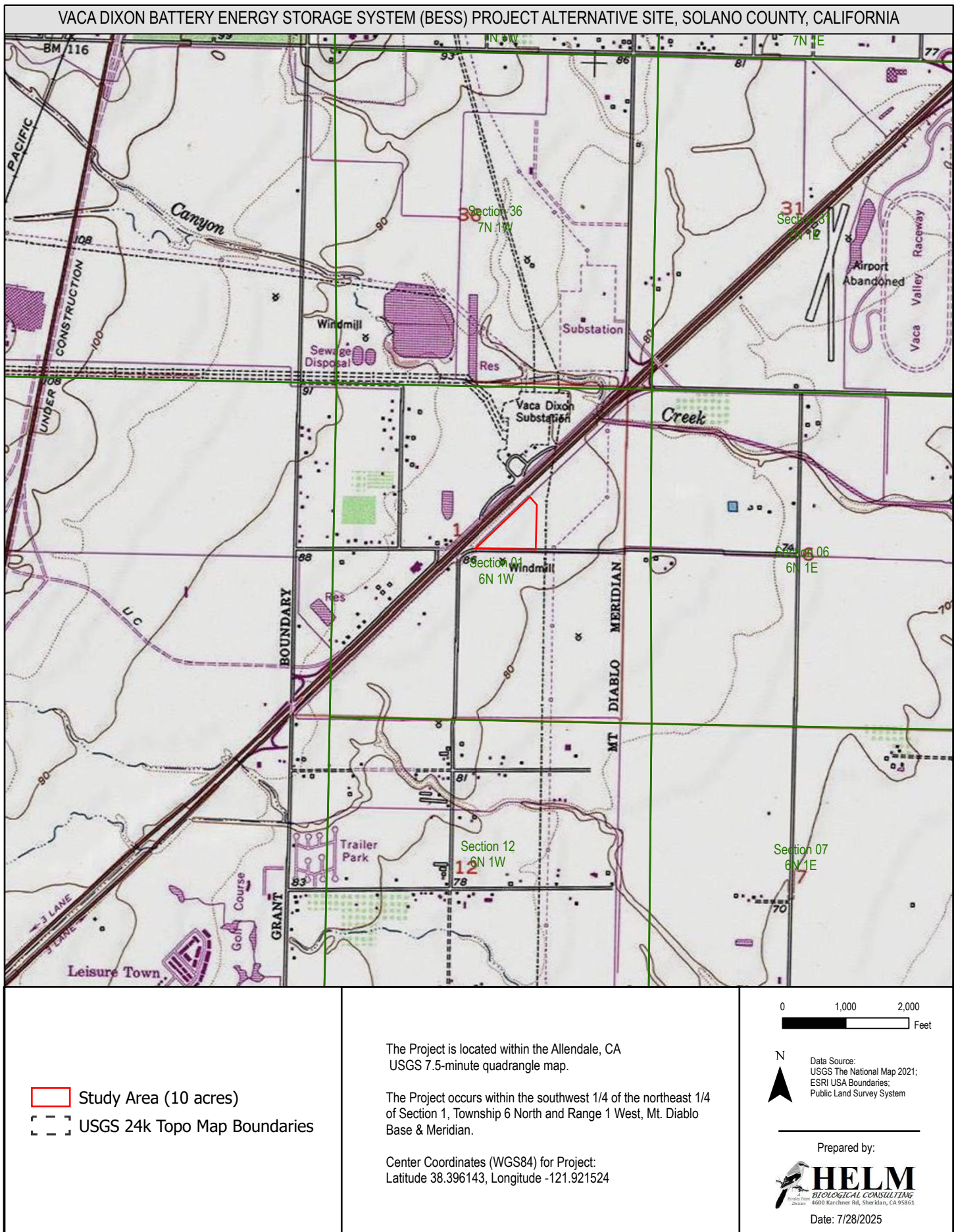


Figure 1. Project Location

METHODS

Dr. Brent Helm of HBC conducted fourteen rounds of protocol-level wet-season sampling during the 2025/2026 wet-season as follows:

- 1st round: October 24, 2025
- 2nd round: November 7, 2025
- 3rd round: November 25, 2025
- 4th round: December 5, 2025
- 5th round: December 19, 2025
- 6th round: January 2, 2026
- 7th round: January 16, 2026
- 8th round: January 30, 2026
- 9th round: February 13, 2026
- 10th round: February 27, 2026
- 11th round: March 13, 2026
- 12th round: March 27, 2026
- 13th round: April 24, 2026
- 14th round: May 8, 2026

The wet-season sampling was conducted under permit TE-795930-10.2 of Section 10(a)(1)(A) of the federal Endangered Species Act, 16 U.S.C. 1531 et seq., and its implementing regulations as authorized by the U.S. Fish and Wildlife Service (USFWS) (Appendix A). Methods generally followed USFWS's (2017) *Survey Guidelines for Listed Large Branchiopods* for wet-season sampling.

HBC's (2025) large branchiopod habitat assessment map (Figure 2) was utilized to target appropriate habitats for sampling. Wet sampling was conducted in all basins (habitats) at the Site that had potential to support federally-listed large branchiopods (Figure 2).

Potential habitat for federally-listed large branchiopods is defined as any seasonal inundated depression that on average ponds water at a sufficient depth and duration for a listed large branchiopod to complete its lifecycle (generally 2.0 inches or greater in depth for 14 or more consecutive days for fairy shrimp and 30 or more consecutive days for tadpole shrimp) (USFWS 2017). Generally these habitats occur within the California Floristic Province at elevations below 1,707 meters in the Coast Ranges (CNDDDB #178) and below 914 meters for the rest of California and Oregon (CNDDDB #244) and Oregon (USFWS 2017). Habitats that swiftly flow water (e.g., creeks, streams, and ephemeral drainages), semi-to-permanently inundated areas that support perennial population of predators (e.g., bullfrogs, fish, and crayfish), and habitats that receive water during the dry season (i.e., artificial water sources) were not generally considered suitable habitat for federally-listed large branchiopods (USFWS 2017).

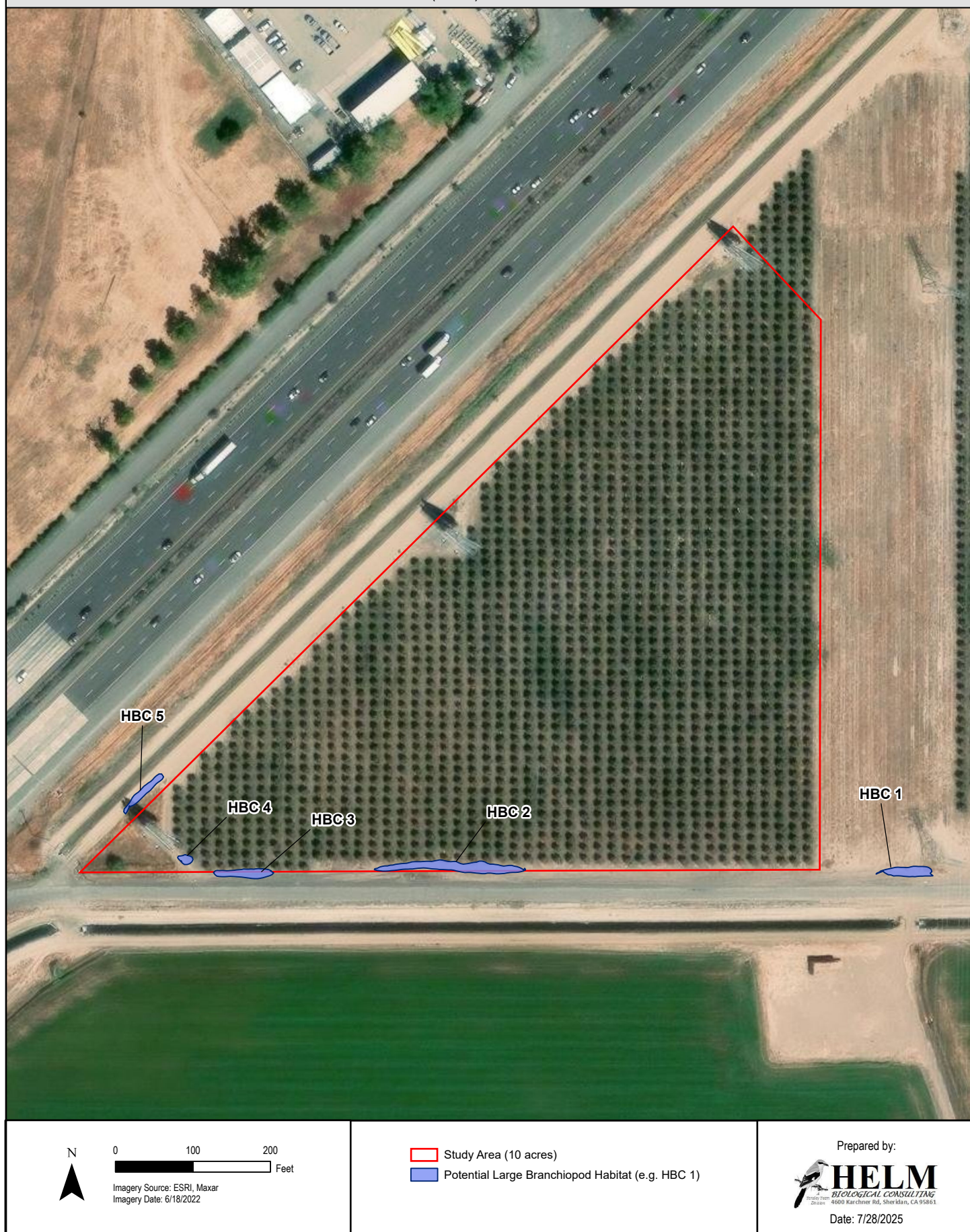


Figure 2. Potential Large Branchiopod Habitat

According to the USFWS (2017), the Project is within Survey Zone A (Southern Oregon, Sacramento Valley, San Francisco Bay Area, North Coast Ranges, Northern Sierra Valley Foothills, Cascade Range foothills, and South Coast Ranges). Therefore wet-season sampling was initiated 14 days after any of the habitats on site (determined to potential large branchiopod habitat) ponded a minimum of 3 centimeters (cm) of standing water.

After initial inundation, wet-season sampling was continued at a minimum of 14-day intervals until the habitats were dry or 90 continuous ponding days had occurred. In cases when the habitats dried and refilled the 90 days would start over. Specific sampling methods are described below.

Each habitat was viewed for active large branchiopods prior to entering the water. Any large branchiopods observed were quickly netted, viewed with the aid of a 30x hand lens to determine species, and released unharmed back into the environment from which they were obtained. If no large branchiopods were observed, then a semi-quantitative sample was taken to determine the relative abundance of large branchiopods as follows.

A dip net was lowered vertically into the deepest portion of the inundated habitat (usually the center) and rested on the bottom. The 80- μ m mesh size dip net was then moved in the direction of the longest axis of the habitat for approximately one-meter. In instances where half of the habitat length is less than one meter in length, the dip net was repositioned in the deepest portion of the habitat and moved in the opposite direction for the remainder of the one-meter sample. Given the aperture of the dip net of 0.025 m² and distance the dip net was moved, roughly 0.025 m³ or 25 liters of the water column was sampled horizontally each time. In those cases when the water column was shallower than the dip net aperture height, the volume of water per sweep was calculated by the horizontal distance the net is moved multiplied by the width of the dip net (25-cm) multiplied by the depth of water. After the completion of each sample sweep, the contents of the net were examined for large branchiopods. All large branchiopods captured in the dip net were identified to the lowest justifiable taxon in the field, and recorded on standardized data sheets. The relative numbers of individuals observed within each taxonomic group was recorded in one of five categories: rare (≤ 2 individuals), not common (3-10 individuals), common (11-50 individual), very common (51 -100 individuals), and abundant (>100 individuals). This method allows for the relative abundances and richness of large branchiopods to be compared between and among wetlands through time. Additionally, this method allows for concentration estimates of large branchiopods to be calculated as number of individuals per liter of water (= number of individuals/net aperture area x length of sweep).

If federally-listed large branchiopods were not detected during the semi-quantified sampling method, then the entire habitat was sampled as follows. Starting at one end of the habitat, the net was moved from one side of the habitat to the other in a zigzag fashion, until the opposite end of the habitat was reached. During this procedure, the net was often bounced along the habitat

bottom (to encourage large branchiopods to move up into the water column from hiding places for easier capture) and viewed often for evidence of large branchiopods. If still no federally listed large branchiopods were captured, then additional netting took place in specific locations within the habitat that may have not been sampled during prior efforts. Additional taxonomic groups of large branchiopods detected using this alternative method is noted as present by an “X” on the standardized field data sheet. After the taxonomic identification and enumeration were completed, the contents of the net were placed back into the habitat from which they were collected.

Data concerning air and water temperatures, present depths (maximum and average [ft]), present ponding surface area (percent inundation), and habitat conditions were collected during each field visit. The potential depths (maximum and average [ft]) and potential ponding surface area percentage were visually estimated. Additionally, presence and abundance data were recorded for all other aquatic species using the same methods as described above for large branchiopod sampling. Representative photographs were taken of the habitats sampled and species observed.

RESULTS

No large branchiopod were observed during the surveys. A total of five wetlands were sampled using wet-season techniques (Figure 3). The first site visit (October 24, 2025) was conducted after a three-day back-to-back storm event that delivered 1.50 inches of rain (Vacaville Nut Tree Airport ASOS, CA USW00093241 (<https://www.ncdc.noaa.gov/cdo-web/quickdata> 2026) that allowed all five basins to inundate. All of the basins dried and refilled at least once during the survey period. With the exception of basin HBC 1 that continuously was inundated for over 90 days, these basins were fairly short lived. Nonetheless, all of the basins were dry by the 12th survey visit on March 27, 2026. All of the basins were re-inundated on April 27 field visit by several storm events that occurred earlier in April (in particular on April 10, 11, 12 and 13 and April 20, 21, and 22). However, by the next visit on April 8, 2026 all of the pools were dry due to the high evaporation and transpiration rates.

Representative photographs of the basins sampled are located in Appendix B. Standardized field data forms are located in Appendix C.

LITERATURE CITED

- Helm Biological Consulting (HBC). 2025. Habitat Suitability Assessment for Federally-listed large Branchiopods at the Vaca Dixon Battery energy Storage System Project Alternative Site, Solano County, California. Prepared for Rincon consultants, Inc. 4825 J Street #200, Sacramento, CA 95819.
- U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS). 2017. Survey guidelines for the listed large branchiopods. 24 pp. Dated: 31 May 2015 (Revised November 13, 2017).

APPENDIX A.
USFWS AUTHORIZATION LETTER



Brent Helm <bhelm@tansleyteam.com>

Re: [EXTERNAL] Large Brachiopod Sampling under Permit TE-795930-12

1 message

SFWO Permits, FW8 <FW8_SFWO_Permits@fws.gov>

Mon, Sep 22, 2025 at 10:11 AM

To: Brent Helm <bhelm@tansleyteam.com>

Cc: "Cook, Megan T" <megan_cook@fws.gov>

Hi Brent,

We simplified our reply by adding an automatic response to this inbox. You may proceed with survey activities after 15 days of the notice's submission; the start date was September 10, and it does not appear that a denial reply was received by then by Megan Cook.

Best,

Stephen Curry, Recovery Permit Coordinator

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](#)

From: Brent Helm <bhelm@tansleyteam.com>

Sent: Thursday, September 11, 2025 9:06 AM

To: SFWO Permits, FW8 <FW8_SFWO_Permits@fws.gov>

Cc: Cook, Megan T <megan_cook@fws.gov>

Subject: Re: [EXTERNAL] Large Brachiopod Sampling under Permit TE-795930-12

Megan,

Does this mean I can proceed with sampling?

Brent

Tansley Team, Inc.

DBA Helm Biological Consulting

4600 Karchner Rd

Sheridan, CA 95681

Phone: (916) 952-0308

Email: bhelm@tansleyteam.com

On Tue, Aug 26, 2025 at 11:38 AM SFWO Permits, FW8 <FW8_SFWO_Permits@fws.gov> wrote:

Thank you for your notification to perform surveys following the [U.S. Fish and Wildlife Service Survey Protocols](#) (whether online or in your permit).

Please include the relevant Geographic Division Supervisor (Cc'ed to this email) in future correspondences related to this notification.

Helpful Links: [ePermits](#) | [Pacific Southwest Recovery Permitting](#) | [Minimum Qualifications](#) | [Survey Protocols](#) | [Vernal Pool Branchiopod Practical Exams](#)

From: Brent Helm <bhelm@tansleyteam.com>

Sent: Tuesday, August 26, 2025 7:24 AM

To: SFWO Permits, FW8 <FW8_SFWO_Permits@fws.gov>

Cc: FWS-FW8 CFWO Permits <fw8_cfwo_permits@fws.gov>

Subject: Re: [EXTERNAL] Large Brachiopod Sampling under Permit TE-795930-12

Sorry about that, here it is.

Brent

Tansley Team, Inc.

DBA Helm Biological Consulting

[4600 Karchner Rd](#)

[Sheridan, CA 95681](#)

Phone: (916) 952-0308

Email: bhelm@tansleyteam.com

On Mon, Aug 25, 2025 at 3:46 PM SFWO Permits, FW8 <FW8_SFWO_Permits@fws.gov> wrote:

Hello Brent,

I didn't receive an attachment to this email. Can you please resend it to me?

Thank you,

Lauren

Helpful Links: [ePermits](#) | [Pacific Southwest Recovery Permitting](#) | [Minimum Qualifications](#) | [Survey Protocols](#) | [Vernal Pool Branchiopod Practical Exams](#)

From: FWS-FW8 CFWO Permits <fw8_cfwo_permits@fws.gov>

Sent: Monday, August 25, 2025 7:05 AM

To: Brent Helm <bhelm@tansleyteam.com>

Cc: SFWO Permits, FW8 <FW8_SFWO_Permits@fws.gov>

Subject: Re: [EXTERNAL] Large Brachiopod Sampling under Permit TE-795930-12

Good morning Brent,

The location proposed for sampling is outside of the Carlsbad jurisdiction, so I have copied the Sacramento office to make them aware of your request.

Thank you,
Jess Sattler

U.S. Fish and Wildlife Service
Carlsbad Field Office Recovery Permit Program
Contact:
fw8_cfwo_permits@fws.gov

Useful links:
[Pacific Southwest Region Recovery Permits web page](#)
[ePermits](#) and [Recovery Permit application page](#)
Technical problems with an ePermits account? Contact [Support](#)

Permittees:
Please include your permit number in all correspondence and reporting, thank you.

From: Brent Helm <bhelm@tansleyteam.com>
Sent: Saturday, August 23, 2025 4:20 PM
To: FWS-FW8 CFWO Permits <fw8_cfwo_permits@fws.gov>
Subject: [EXTERNAL] Large Brachiopod Sampling under Permit TE-795930-12

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

To Whom It May Concern,

Attached is a request to conduct dry-season sampling for the Vaca Dixon Battery Energy Storage System Project Alternative Site. Thank you for your time and consideration regarding this matter.

Brent
Tansley Team, Inc.
DBA Helm Biological Consulting
4600 Karchner Rd
Sheridan, CA 95681
Phone: (916) 952-0308
Email: bhelm@tansleyteam.com

APPENDIX B.

REPRESENTATIVE PHOTOGRAPHS



Photograph of HBC -1 road rut taken by Brent Helm on April 24, 2026 facing northeast.



Photograph of HBC -1 road rut taken by Brent Helm on April 24, 2026 facing northeast.



Photograph of HBC-3 road rut taken by Brent Helm on April 24, 2026 facing northwest.



Photograph of HBC-2 road rut taken by Brent Helm on April 24, 2026 facing northeast.



Photograph of HBC-5 road rut taken by Brent Helm on November 7, 2026 facing north.



Photograph of HBC-4 road rut taken by Brent Helm on November 7, 2026 facing northwest.



Photograph of HBC-3 road rut taken by Brent Helm on November 7, 2026 facing west.



Photograph of HBC-2 road rut taken by Brent Helm on November 7, 2026 facing west.



Photograph of HBC-1 road rut taken by Brent Helm on November 7, 2026 facing west.



Photograph of HBC-1 road rut taken by Brent Helm on March 13, 2026 facing west.

APPENDIX C.
WET-SEASON SAMPLING FIELD FORMS

Project:

Surveyor(s): *Helm*
Time: *11:50 AM*

Weather Cond: Partly cloudy, slight breeze
Air Temperature(°F): 68°F-72°F

Air Temperature(°F):

Abundance: R = Rare (≤ 2 individuals), NC = Not Common (3-10 individuals), C = Common (11-50 individuals), VC = Very Common (51-100 individuals), A = Abundant (> 100 individuals)
Hydrology: D = dry, N/P = not ponding, M=moist, S = saturated to surface, I/P = intermittent ponding, X = Present but not observed in 1 meter sample
LR Reductive Status: I = immature, m = mature, g = gravid (with eggs)

Habitat Condition:

UD = undisturbed, D = disturbed - tt = tire tracks, t = trash, p = plowing
UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

[illegible]

Weather Cond: Cold, slight breeze
Air Temperature(°F): 44

Weather Cond: Foggy
Air Temperature(°F): 70.5

Time: 7:37am

Weather Cond:

Air Temperature(°F):

Habitat Condition:
UD = undisturbed, D = disturbed - tt = tire tracks, t = trash, p = plowing
UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

Hydrology: D = dry, N/P = not ponding, M=moist, S = saturated to surface, I/P = intermittent ponding, X = Present but not observed in 1 meter sample

LB Redroductive Status: i = immature, m = mature, g = gravid (with eggs)

[illegible]

Weather Cond: Fair
Air Temperature(°F): 47°F

[illegible]

Date: Jan 2, 2026

Time: 10:22 am

Air Temperature(°F): 51 °F

R = Rare (≤ 2 individuals), NC = Not Common (3-10 individuals), C = Common (11-50 individuals), VC = Very Common (51-100 individuals), A = Abundant (>100 individuals)

D = dry, N/P = not ponding, M=moist, S = saturated to surface, I/P = intermittent ponding, X = Present but not observed in 1 meter sample

LB Redroductive Status: i = immature, m = mature, g = gravid (with eggs)

UD = undisturbed, D = disturbed - tt = tire tracks, t = trash, p = plowing

UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

[illegible]

Date: Jan 30, 2026

Time:

Welm, B
4544

Weather Cond:

Air Temperature(°F):

Cold, clear, slight Breeze
42°F

Abundance: R = Rare (≤ 2 individuals), NC = Not Common (3-10 individuals), C = Common (11-50 individuals), VC = Very Common (51-100 individuals), A = Abundant (>100 individuals)

Hydrology: D = dry, N/P = not ponding, M=moist, S = saturated to surface, I/P = intermittent ponding, X = Present but not observed in 1 meter sample

LB Redroductive Status: i = immature, m = mature, g = gravid (with eggs)

Habitat Condition:

UD = undisturbed, D = disturbed - tt = tire tracks, t = trash, p = plowing

UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

[illegible]

Date: Feb 13, 2020

Surveyor(s): Welm
Time: 10:06 am

Weather Cond: Cold
Air Temperature(°F): 45°F

Habitat Condition:
UD = undisturbed, D = disturbed - tt = tire tracks, t = trash, p = plowing
UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

[illegible]

Weather Cond: Partly Cloudy

Date: Feb 27, 2026

Time: 9:30 AM

Air Temperature(°F): 48°F

Abundance: R = Rare (≤ 2 individuals), NC = Not Common (3-10 individuals), C = Common (11-50 individuals), VC = Very Common (51-100 individuals), A = Abundant (>100 individuals)

Habitat Condition:

UD = undisturbed, D = disturbed - tt = tire tracks, t = trash, p = plowing

— = present; + = present; g_i = number of intervals observed; A = present but not observed in 1 meter sample

UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

[illegible]

Date: 3/13/2026

Time: 10:35 a.m.

Air Temperature(°F): 77.80

Abundance: R = Rare (≤ 2 individuals), NC = Not Common (3-10 individuals), C = Common (11-50 individuals), VC = Very Common (51-100 individuals), A = Abundant (>100 individuals)

Hydrology: D = dry, N/P = not ponding, M=moist, S = saturated to surface, I/P = intermittent ponding, X = Present but not observed in 1 meter sample

LB Redroductive Status: i = immature, m = mature, g = gravid (with eggs)

Habitat Condition:

UD = undisturbed, D = disturbed - tt = tire tracks, t = trash, p = plowing

UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

[illegible]

[illegible]

Project: Vaca-Dixon BESS Alt Site
Date: April 24, 2026

Surveyor(s): Helm, Brant
Time: 1:20 pm

Weather Cond: warm, clear
Air Temperature(°F): 70°F

Abundance: R = Rare (≤ 2 individuals), NC = Not Common (3-10 individuals), C = Common (11-50 individuals), VC = Very Common (51-100 individuals), A = Abundant (> 100 individuals)
Hydrology: D = dry, NP = not ponding, M=moist, S = saturated to surface, IP = Intermittent ponding, X = Present but not observed in 1 meter sample
LB Redroductive Status: I = immature, m = mature, g = gravid (with eggs)

Habitat Condition:
UD = undisturbed, D = disturbed - tt = tire tracks, t = trash, p = plowing
UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

[illegible]

Air Temperature(°F): 83°F

Habitat Condition:
 UD = undisturbed, D = disturbed - it = tire tracks, t = trash, p = plowing
 UG = ungrazed, G = grazed - C = cattle, H = horse, S = sheep, l = light grazing, m = moderate grazing, h = heavy grazing

[illegible]