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2010 Dry and 2009 - 2010 Wet Season Branchiopod Survey Report, Site 300

W. Dexter

March 15, 2011

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This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

2009-2010 Wet Season Branchiopod Survey Report

Site 300 Experimental Test Site
Lawrence Livermore National Laboratory
Alameda and San Joaquin Counties, California

July 16, 2010

Prepared for:
Subcontract No. B588157
Lawrence Livermore National Laboratory
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Prepared by:
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INTRODUCTION

Project Description

Lawrence Livermore National Laboratory (LLNL) requested that Condor Country Consulting, Inc. (CCCI) perform wet season surveys and manage the dry season sampling for listed branchiopods in two ponded locations within the Site 300 Experimental Test Site. Site 300 is located in Alameda and San Joaquin Counties, located between the Cities of Livermore and Tracy (Figure 1). The two pool locations (Figure 2) have been identified for possible amphibian enhancement activities in support of the Compensation Plan for impacts tied to the Building 850 soil clean-up project.

Purpose of the Survey

The Building 850 project design resulted in formal consultation with the U.S. Fish and Wildlife Service (USFWS) as an amendment (File # 81420-2009-F-0235) to the site-wide Biological Opinion (BO) (File # 1-1-02-F-0062) in the spring of 2009 and requires mitigation for the California tiger salamander (AMCA, *Ambystoma californiense*) and California red-legged frog (CRLF, *Rana draytonii*) habitat loss. Both pools contain breeding AMCA, but do not produce metamorphs due to limited hydroperiod. The pool to the southeast (Pool BC-FS-2) is the preferred site for amphibian enhancement activities, and the wetland to northwest (Pool OA-FS-1) is the alternate location for enhancement. However, prior to enhancement, LLNL has been directed by USFWS (BO Conservation Measure #17 iii) to “conduct USFWS protocol-level branchiopod surveys to determine whether listed brachiopod species are present within the compensation area.”

CCCI conducted surveys for listed branchiopods in the 2009-2010 wet season to determine the presence of federally-listed branchiopods at the two pools (previous surveys with negative findings were performed by CCCI in 2001-2002 and 2002-2003 onsite). Surveys were conducted to partially satisfy the survey requirements of 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” (“Guidelines”, USFWS 1996 and BO Conservation Measure #17 iii). The dry sampling (include as an Appendix D) followed the wet season surveys in the summer of 2010.

For the purpose of this report, the term branchiopod refers specifically to phyllopodous branchiopods (Smith 2001) and not cladocerans. Fairy shrimp, tadpole shrimp, and clam shrimp are all categorized as phyllopodous branchiopods and are currently the only members of the Class Branchiopoda that contain species that are listed under the federal Endangered Species Act. Although cladocerans are branchiopods, they are only referred to by Order in this report because they are not federally listed and therefore are not the target species of this study.

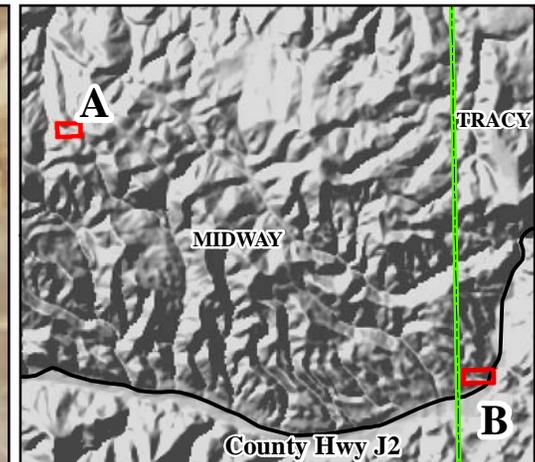
The following report is submitted in accordance with the conditions of USFWS Permit TE-016591-5.1 (Appendix A). The format of the report follows the format outlined in the Guidelines (USFWS 1996). Appendix A also includes an accuracy statement from the surveying biologist, in accordance with the USFWS letter dated March 2005.



Fairy Shrimp Survey Locations - Project Area
Lawrence Livermore National Laboratory
Site 300 Experimental Test Site

Figure 1





Legend

- Fairy Shrimp Survey Pools
- USGS 7.5' Quadrangle Boundary

Surveys located within Alameda and San Joaquin Counties, in the Midway and Tracy 7.5' USGS topographic quadrangles.
Sources: California Spatial Information Library & ESRI



Listed Branchiopod Survey Pool Locations
Lawrence Livermore National Laboratory
Site 300 Experimental Test Site

Figure 2

METHODOLOGY

CCCI's principal biologist, Wendy Dexter (TE-016591-5.1), conducted the wet season surveys to determine the status of vernal pool branchiopods at the two pool locations. Written authorization to conduct these surveys was received from Angela Picco of the USFWS via email on January 14, 2010 (Service File No. 81420-2009-F-0235). The dry season survey findings report will be provided under a separate cover (Appendix D).

Study Area

The study area consists of the two pool locations within Site 300 Experimental Test Site that may serve as locations for amphibian habitat enhancement. They are located on Midway and Tracy USGS 7.5 minute topographic quadrangle maps (Figure 1). The total project area, combining the area of both pools is 480 m² (5,167 ft²).

Topography within the Site 300 boundary consists of moderate to steep sloping, rolling hills that range in elevation from approximately 152 meters (500 feet) to 524 meters (1720 feet) above mean sea level, generally increasing from southeast to northwest. Non-native and native annual grasslands dominate the hills, and ephemeral streams bisect the landscape. Aquatic features in the general vicinity include ephemeral pools and perennial and intermittent drainages.

Current land use in the vicinity of the study area is primarily experimental testing of explosives ignition devices. There is also a waste water evaporation facility near one of the survey pools that treats Site 300 waste water. Surrounding land use consists of cattle grazing, wind-produced electricity farms and the Carnegie State Vehicular Recreation Area.

Site 300 consists primarily of annual grasslands, with smaller patches of native grasslands and forbs. Other community types onsite include oak woodland, coastal sage scrub, and riparian woodland. Freshwater marsh and seep habitats also occur in the vicinity of the study area, where water persists through much of the year. Freshwater marsh/seep vegetation occurs in conjunction with some ephemeral pools and seep fed streams.

The aquatic habitat at the two locations consists of a pooled drainage site above a road crossing (BC-FS-2) and an overflow pool (OA-FS-1) below the largest ephemeral pond onsite. Both sites were created by blocking the outfall of the natural drainage with an earthen berm thereby extending the hydroperiod. Neither pool harbors emergent vegetation typical of stock ponds inundated for long durations each year. Both pools provide potentially suitable habitat for large branchiopods.

Survey Methodology

Surveys were conducted according to the methods described in the Guidelines (USFWS 1996). Wet season surveys began on February 4, 2010, within two weeks of the pools filling to a depth greater than 3 cm (1 in). Sampling occurred every two weeks thereafter until May 14, 2010 when both pools were dry. The surveys performed in the interim were conducted on the dates listed in Table 1.

Each day's survey data were collected on USFWS Vernal Pool Data Sheets (Appendix B). A fine-meshed aquarium net attached to a piece of plastic PVC pipe was used to sample the water column. Samples were taken at the surface, throughout the water column, and along the margins and bottom of each pool. Identification of specimens was performed in the field using a 16X hand lens. Living specimens were identified and returned to their collection location. All amphibian eggs and larvae found in samples were released at the point of capture after being identified to species.

Survey locations were limited to those identified as potential enhancement sites in the amendment to the site-wide BO. Air and water temperature data were taken at the beginning of the survey for each pool. Other data recorded for each pool include habitat type, pool dimensions, and branchiopods, amphibians, waterfowl, and other aquatic invertebrates observed.

HABITAT DESCRIPTIONS

The majority of Site 300 provides suitable habitat for a wide variety of species; only 5% of the property is currently developed for explosives testing or as infrastructure. Prior to the early 1950's and federal acquisition of the property, grazing was an element of this landscape, but is no longer practiced. Annual prescribed burns are implemented for fire protection.

Surveyed Pools

The two sites, Pool OA-FS-1 and Pool BC-FS-2, are best described as a stock pond outfall and a stock pond, respectively. Pool OA-FS-1 is approximately 160 m² (1,722 ft²) at full capacity. Pool BC-FS-2 is approximately 320 m² (3,444 ft²) at its fullest. Maximum pool depth for each pool was estimated at 122 cm (48 in) and 100 cm (39 in), respectively. The habitat suitability of these pools is influenced by factors such as the duration of ponding and the presence or absence of fish and other potential aquatic predators. Ponding persisted at both pools for between 12 and 14 weeks, plenty of time for all California freshwater branchiopods that could occur on the site to complete their lifecycle. Fish populations have not been recorded at Site 300 and were not detected in either pool. Other possible predators encountered during surveys are reported in the results section.

Pool characteristics varied between the two survey locations. Pool OA-FS-1 had a loamy substrate vegetated with grasses and surrounded by mainly annual grasses. This pool is fed, in part, by the adjacent ephemeral pond. The adjacent pond holds a large volume of water and is known to be a successful breeding location for AMCA and CRLF and also harbors California linderiella (*Linderiella occidentalis*). Pool BC-FS-2, also a relatively large pool, had a fine clay-silt substrate that often caused the water to be milky in appearance. Vegetation within the pool is limited to skeletons of tumble weeds (Russian thistle, *Salsola tragus*) remaining from those that grew in the drainage during the previous dry season. Vegetation surrounding this pool is ruderal in nature with annual grasses dominant.

Upland Habitat

The area surrounding the two pool locations consists of rolling grasslands, with a mix of native and non-native grasses and forb species. Pool OA-FS-1 is in the outfall of a larger pool that has

provided habitat for California linderiella, CRLF, and AMCA. Pool BC-FS-2 is across Corral Hollow Road from Corral Hollow Creek, a known breeding location for Western spadefoot (*Spea hammondi*). This pool is also in close proximity to the Site 300 wastewater evaporation facility. The wastewater evaporation facility consists of two pools, the larger treatment pool that supports a variety of waterfowl and a secondary overflow pool in which tadpoles likely to be CRLF were incidentally observed during the branchiopod surveys. Both pools are surrounded by primarily annual grasslands.

SURVEY RESULTS

The 2009-2010 wet season survey of Pools OA-FS-1 and BC-FS-2 identified no listed branchiopods. One fairly common branchiopod species, California linderiella, was observed in OA-FS-1. Pools surveyed are mapped in Figure 2. Datasheets containing information such as survey date, time, weather, habitat characteristics, pool dimensions, and species observed are provided in Appendix B. Pool names, dates, coordinate locations, and species observed each survey are summarized in Table 1. The distribution of invertebrates and amphibians detected during the branchiopod surveys is reported below.

Sampling Location

The study area is located in Alameda and San Joaquin Counties (Figure 1), on the Midway and Tracy, California, U. S. Geological Survey 7.5-minute topographic quadrangle maps, respectively. The locations of the sampled pools are shown in Figure 2. The two sampling locations were specifically chosen by the Site 300 biologist because of their potential for use as amphibian habitat enhancement sites. Pool OA-FS-1 is adjacent to and down gradient of another ephemeral pond and retains water due to a firetrail blocking the outfall. Pool BC-FS-2 was also created by a road crossing the bottom of a drainage, although at this location a culvert was installed to allow water to pass under the road once the pool has filled.

Study Area Photographs

Copies of color photographs of the two pool locations are included in Appendix C. Photography was restricted on the site so the photos were taken by Mr. Jim Woollett, biologist for Site 300, before and after the pools filled. Photograph captions include the date and the direction from which the photo was taken.

Species Identified and Population Size

California linderiella was the only branchiopod observed and it was only observed in OA-FS-1. All individuals observed were dead, likely due to high water temperatures prior to the survey in which they were detected. This species numbered less than 200 individuals in this pool. Other invertebrates found in OA-FS-1 included ostracods, chaobotids, cladocerans, culicids, zygoptera, notonectids, corixids, and chironomids (Voshell 2002).

No branchiopods were observed in BC-FS-2. Other invertebrates found in this pool included ostracods, cladocerans, notonectids, corixids, and chironomids.

Table 1. Branchiopod Survey Summary

Pool #	Survey Date	Latitude, Longitude (decimal degrees)	Special Status Species Observed	Other Species Observed
OA-FS-1	02/04/10	37.67203, -121.56666	none	none
BC-FS-2	02/04/10	37.63658, -121.49549	none	Ost, Cor, Chi
OA-FS-1	02/19/10	37.67203, -121.56666	none	LIOC (dead), Ost
BC-FS-2	02/19/10	37.63658, -121.49549	SPHA eggs	Ost, Cor, Not
OA-FS-1	03/05/10	37.67203, -121.56666	none	Ost, Cor, Chi
BC-FS-2	03/05/10	37.63658, -121.49549	SPHA tadpoles	Ost, Cor, Chi
OA-FS-1	03/19/10	37.67203, -121.56666	none	Cl, Ost, Cor
BC-FS-2	03/19/10	37.63658, -121.49549	SPHA tadpoles	Ost, Cor, Chi
OA-FS-1	04/02/10	37.67203, -121.56666	none	Chi, Cha
BC-FS-2	04/02/10	37.63658, -121.49549	SPHA tadpoles, 3 AMCA larvae	Cl, Ost, Cor, Not
OA-FS-1	04/16/10	37.67203, -121.56666	none	PSSI male and 10 egg masses, Ost, Cor, Cul, Chi, Cha
BC-FS-2	04/16/10	37.63658, -121.49549	7 SPHA tadpoles, 1 AMCA larva	Ost, Cor, Not
OA-FS-1	04/30/10	37.67203, -121.56666	none	BUBO tadpoles, Ost, Cor, Zyg, Cul, Chi
BC-FS-2	04/30/10	37.63658, -121.49549	100+ SPHA tadpoles, 3 AMCA larvae	PSSI tadpoles, Cor, Not
OA-FS-1	05/14/10	37.67203, -121.56666	none	none
BC-FS-2	05/14/10	37.63658, -121.49549	5 SPHA metamorphs	none

KEY: Invertebrates Amphibians

LIOC=California linderiella (*Linderiella occidentalis*)
 Cha=Chaobtidae
 Chi=Chironomid
 Cl=Cladocera
 Cor=Corixid
 Cul=Culicidae
 Not=Notonectid
 Ost=Ostracods
 Zyg=Zygoptera

AMCA=California tiger salamander (*Ambystoma californiense*)
 BUBO=California toad (*Bufo boreas halophilus*)
 PSSI=Sierran treefrog (*Pseudacris sierra*)
 SPHA=Western spadefoot (*Spea hammondi*)

Two amphibian species were observed incidental to surveying for branchiopods in OA-FS-1. Observations included one adult and ten egg masses of Sierran treefrog (*Pseudacris sierra*) and many California toad (*Bufo boreas halophilus*) tadpoles.

Amphibians were also observed in Pool BC-FS-2. Western spadefoot eggs, tadpoles, and metamorphs, Sierran treefrog tadpoles, and AMCA larvae were found in this pool during branchiopod surveys. Western spadefoot is a small, xeric habitat adapted toad listed by the California Department of Fish and Game as a Species of Special Concern. California tiger salamander is listed as Threatened under the federal Endangered Species Act and is a State Candidate for Endangered listing under the California Endangered Species Act.

California Linderiella (*Linderiella occidentalis*)

California linderiella, a California endemic, is the most common inhabitant of cool water vernal pools in the Central Valley (Eriksen and Belk 1999). This species can be active from late December through early May and tolerates temperatures ranging from 5°C to 29.5°C (Eriksen and Belk 1999). This species is not listed under the federal Endangered Species Act.

Of the two pools surveyed, California linderiella was only detected in one pool, OA-FS-1. The species has been detected in other pools at Site 300 in years past (Condor Country Consulting, Wet Season Branchiopod Surveys 2001-2002, 2002-2003) and were incidentally observed in the pool adjacent to OA-FS-1 during this survey effort.

CONCLUSIONS

The proposed amphibian habitat enhancement at either of the two pools is not likely to have a negative effect on any special status branchiopods because none were observed in the pools during this survey. One non-listed large branchiopod species occupies one of the two pools analyzed in this survey effort. The other pool, BC-FS-2, was occupied by two special status amphibians, Western spadefoot and AMCA. Both pools were inundated consecutively for between 12 and 14 weeks. Rainfall in the area was above average for the 2009-2010 wet season. There were no detected anomalies that would preclude detection of listed species if they were present. Dry season surveys (Appendix D) have been performed to complete this survey per the Guidelines. *No cysts of federally listed branchiopods were detected, so the proposed habitat enhancement will have no effect on federally listed branchiopods.*

REFERENCES

- Eriksen, Clyde, and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press, Eureka, CA.
- Smith, D. G. 2001. Pennak's freshwater invertebrates of the United States: porifera to crustacea (4th ed.). John Wiley and Sons, Inc., New York, NY.
- U.S. Fish and Wildlife Service (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. USFWS Sacramento Field Office, Sacramento, CA.
- Voshell, J. R. 2002. A guide to common freshwater invertebrates of North America. McDonald & Woodward Publishing Company, Granville, Ohio, USA.

APPENDIX A

ACCURACY STATEMENTS AND SURVEYOR'S RECOVERY PERMIT

July 16, 2010

CONDOR COUNTRY CONSULTING, INC.

Accuracy Statement

I, Wendy Dexter, certify that the information in this survey report and attached exhibits fully and accurately represent my work.

Signed: Wendy K. Dexter

Date: July 14, 2010

Permit Number: TE-016591-5.1

Protocol surveys authorized under Permit Number TE-016591-5.1



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In reply refer to:
81420-2010-TA-0159

Wendy Dexter
Condor Country Consulting
411 Ferry St., Suite 6
Martinez, California 95553-1145

Subject: Change to List of Authorized Individuals for Permit TE-016591

Dear Ms. Dexter:

This is in response to your electronic mails dated November 20, 2009 and November 30, 2009, requesting changes to the list of individuals authorized to conduct activities pursuant to section 10(a)(1)(A) permit TE-016591. Specifically, you have requested that Mark Mendelsohn and Felix Radcliff be added to the list of authorized individuals to independently conduct activities with respect to the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). You have also requested that Sarah Foster be removed from the list of authorized individuals for your permit.

We have reviewed the material transmitted with your letter and authorize the addition of Mark Mendelsohn and Felix Radcliff to the permit under the conditions stipulated therein. We have also removed Sarah Foster from your permit as requested.

Please contact staff biologist, David Kelly at (916) 414-6492, if you have questions regarding this response.

Sincerely,

Eric Tattersall
Deputy Assistant Field Supervisor

Enclosure

cc:

Pacific Southwest Region (Attn: Daniel Marquez c/o CFWO Carlsbad, CA)
CDFG



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

LIST OF AUTHORIZED INDIVIDUALS TE-016591-5.1

1. Individual authorized to independently conduct activities pursuant to this permit:

Wendy Dexter.

2. Individuals authorized to independently conduct surveys for the garter snake, the whip snake, the red-legged frog, and the tiger salamander pursuant to this permit:

Jeff Alvarez.

3. Individuals authorized to independently conduct surveys for the garter snake pursuant to this permit:

Mark Mendelsohn and Felix Radcliff.

Supervised individuals may conduct activities pursuant to this permit only under the direct on-site supervision of an individual authorized to independently conduct activities listed above. On-site supervision is defined as an unauthorized individual conducting activities within 3 meters (9.8 feet) of an authorized individual.

02 Dec 2009
Date

E. Tattersall
Eric Tattersall
Deputy Assistant Field Supervisor

This List is only valid if it is dated on or after the permit issuance date.

FILENAME CC ADDRESSES OTHER INSTRUCTIONS --- NOT FOR MAILING

CC ADDRESSES

CDFG, Recovery Permits
Habitat Conservation Planning Branch
1812 9th Street
Sacramento, CA 95811

FILENAME

M:\ESD\RECOVERY\RECOVERY_PERMITTING\Signed Permits\016591- Dexter \016591 -
LAI - 20091130.doc

OTHER INSTRUCTIONS

After signature:

E-mail to: Daniel Marquez

Mail to: Daniel Marquez
VFWO Chris Kofron
CDFG

No other instructions at this time.





United States Department of the Interior



FISH AND WILDLIFE SERVICE
California/Nevada Operations Office
2800 Cottage Way, Suite W-2606
Sacramento, California 95825-1846

IN REPLY REFER TO:
CNO/Recovery

APR 16 2008

Dear Permittee:

Enclosed is your U.S. Fish and Wildlife Service recovery permit issued under section 10(a)(1)(A) of the Endangered Species Act (ESA), 16 U.S.C. 1531 *et seq.*, and its implementing regulations.

Please refer to the permit number in all correspondence and reports concerning permit activities. Engagement in any activity pursuant to this permit constitutes understanding and acceptance of the Special Terms and Conditions attached to your permit.

By accepting this permit and conducting activities authorized by it, you are agreeing to adhere to the attached terms and conditions. Failure to meet permit terms and conditions could result in ESA section 9 take violations, or suspension/revocation of this permit.

Please be aware that some species named in your recovery permit may also be listed under various State Endangered Species Acts or otherwise be of special concern to the States. As such, activities affecting those species may not be conducted without first obtaining the appropriate State permits. Federal permits do not supersede State authorizations.

If you have any questions regarding this matter, please contact Daniel Marquez at 760-431-9440. Thank you.

Sincerely,

Michael Fris
Chief, Endangered Species Division

Enclosures

TAKE PRIDE
IN AMERICA 



FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

WENDY DEXTER
411 FERRY STREET
SUITE 6
MARTINEZ, CA 94553
U.S.A.

2. AUTHORITY-STATUTES
16 USC 1539(a)
16 USC 1533(d)

REGULATIONS (Attached)
50 CFR 17.22
50 CFR 17.32

50 CFR 13

3. NUMBER

TE016591-5

AMENDMENT

4. RENEWABLE

YES

NO

5. MAY COPY

YES

NO

6. EFFECTIVE

04/15/2008

7. EXPIRES

04/14/2012

8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)

9. TYPE OF PERMIT

THREATENED AND ENDANGERED SPECIES

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

ON LANDS SPECIFIED WITHIN THE ATTACHED SPECIAL TERMS AND CONDITIONS

11. CONDITIONS AND AUTHORIZATIONS:

- A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.
- B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.
- C. VALID FOR USE BY PERMITTEE NAMED ABOVE.
- D. Further conditions of authorization are contained in the attached Special Terms and Conditions.

ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ANNUAL REPORTS DUE: 1/31
See permit conditions for further reporting requirements.

ISSUED BY

TITLE

ENDANGERED SPECIES PROGRAM MANAGER

DATE

04/15/2008

SPECIAL TERMS AND CONDITIONS
Wendy Dexter

1. This permit was previously issued on September 1, 2006. The terms and conditions set forth in that permit are hereby superseded by this amendment.
2. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the "General Conditions for Native Endangered and Threatened Wildlife Species Permits," 50 CFR Part 13, 50 CFR 17.22 (endangered wildlife), and 50 CFR 17.32 (threatened wildlife), as applicable (copies attached). In addition, the permittee must have all other applicable State and Federal permits prior to the commencement of activities authorized by this permit.
3. The permittee is authorized to take (harass by survey, collect, and sacrifice) the Conservancy fairy shrimp (*Branchinecta conservatio*), the longhorn fairy shrimp (*Branchinecta longiantenna*), the Riverside fairy shrimp (*Streptocephalus woottoni*), the San Diego fairy shrimp (*Branchinecta sandiegonensis*), the vernal pool fairy shrimp (*Branchinecta lynchi*), and the vernal pool tadpole shrimp (*Lepidurus packardii*) (hereafter collectively referred to as vernal pool branchiopods); take (capture, handle, mark, and release) the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*; garter snake), and the Alameda whipsnake (*Masticophis lateralis euryxanthus*; whipsnake); and take (harass, capture, and release) the California red-legged frog (*Rana aurora draytoni*; frog) and the California tiger salamander (*Ambystoma Californiense*; tiger salamander) in conjunction with population surveys for the purpose of enhancing their survival, as specified in the permittee's October 30, 2007, renewal and amendment request, in accordance with the conditions stated below.
4. Permitted activities are restricted to the following geographic area in California:

Throughout the range of each species.

Proposals to conduct survey activities within the above referenced areas shall be submitted in writing to the Recovery Permit Coordinator at the appropriate Fish and Wildlife Office (FWO) of the U.S. Fish and Wildlife Service (Service) at least 10 days prior to conducting activities for the vernal pool branchiopods and at least 30 days prior to conducting activities for the tiger salamander, garter snake, whipsnake, and the frog. The appropriate FWO is determined as follows:

For the Central Valley hydrographic basin and the coast ranges north of the Santa Cruz County line, contact the Sacramento Fish and Wildlife Office (SFWO), 3310 El Camino, Suite 130, Sacramento, California 95821 (telephone: 916-414-6600; fax: 916-414-6710). For areas from Santa Cruz County south to Los Angeles County north of the Angeles National Forest, contact the Ventura Fish and Wildlife Office (VFWO), 2493 Portola Road, Suite B, Ventura, California 93003

(telephone: 805-644-1766; fax: 805-644-3958). For areas from Los Angeles County including and south of the Angeles National Forest to San Diego County, contact the Carlsbad Fish and Wildlife Office (CFWO), 6010 Hidden Valley Road, Carlsbad, California 92011 (telephone: 760-431-9440; fax: 760-431-9624).

Proposals shall include: (i) an explanation of the purpose of the study and a clear description of methods, including the names of field personnel, and the number and dates of surveys; (ii) a map (at a minimum, a 1:24,000 scale U.S. Geological Survey (USGS) topographic map) depicting the location of the survey site(s); (iii) the number of vernal pools or number of acres proposed to be surveyed; (iv) the number of individuals proposed to be capture or collected; (v) the name of the individual who will be completing the soil processing and/or preliminary vernal pool branchiopod cyst identification; (vi) the assessor's parcel number (APN) for the site (if possible); and (vii) geographic information system (GIS) data depicting the survey site or global positioning system (GPS) coordinates (if possible). Information may be submitted electronically if pre-arranged with the Recovery Permit Coordinator.

The permittee may not commence activities authorized by this permit in a new area or in a previously authorized site at a new time until permission is received from the appropriate FWO. If the permittee is denied authorization to survey at the requested location(s), including previously authorized sites, a request for reconsideration may be submitted to the Endangered Species Program Manager at the Service's Regional Office for the California and Nevada Region (Region 8), 2800 Cottage Way, Room W-2606, Sacramento, California 95825-1846, as provided in 50 CFR 13.29. The procedures specified in 50 CFR 13.29(b) must be followed.

5. Authorized individuals:

Only individuals on the attached List of Authorized Individuals (List) are authorized to conduct activities pursuant to this permit. The List, printed on Service letterhead, may identify special conditions or circumstances under which individuals are authorized to conduct permitted activities and must be retained with these Special Terms and Conditions. Each named individual shall be responsible for compliance with the terms and conditions of this permit.

To request changes to the List, the permittee shall submit written requests to the SFWO. Two copies of the request shall be submitted at least 30 days prior to the requested effective date. The request shall be signed and dated by the permittee and include:

- a. The name of each individual to be appended to the List;
- b. The resume/qualifications statement of each person to be appended to the List, detailing their experience with each species and type of activity for which authorization is requested;

- c. The names and phone numbers of a minimum of two references; and
- d. The names of the individuals to be deleted from the List.

Note: This procedure is for personnel changes only. For requests to renew/amend this permit, a complete application must be submitted to the Endangered Species Program Manager, at the Region 8 Office.

6. Taking of the vernal pool branchiopods:

The permittee is authorized to sample and collect voucher specimens of the above vernal pool branchiopods (both hatched individuals and eggs) within the geographic boundaries specified above, and the time limitation specified in the permit, provided that:

- a. The permittee must implement all of the actions included in the attached *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* (Guidelines), dated April 19, 1996. The Guidelines will be updated periodically and the permittee must follow the most recent Guidelines after receipt of such. Any deviation from these Guidelines shall first be approved verbally or in writing by the appropriate FWO.
- b. As specified in the Guidelines, sampling/collecting of hatched individuals or eggs is not authorized at any specific location until the permittee obtains approval from the appropriate FWO.

Note: The sampling and preservation of voucher specimens from locations that have been previously surveyed will not be authorized, except in cases where the adequacy of the earlier survey work is in doubt or otherwise should be repeated as determined by the Service.

- c. The number of voucher specimens authorized to be collected and preserved is limited as follows:

No more than 20 hatched individuals of each species from each vernal pool (or swale) per sampling visit or less than 10 percent of the subpopulation in the vernal pool (or swale) during the sampling visit, whichever is the lesser amount.

- d. The permittee is authorized to collect an unquantifiable number of vernal pool branchiopod eggs contained within soil samples taken following the most recent Guidelines. The total amount of soil samples each calendar year shall not exceed a ratio of 1 liter per each 10 square meters (approximately 1 percent at 1 centimeter deep) of estimated vernal pool surface area surveyed.

- e. The permittee shall disinfect sampling and field gear as follows:
 - i. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (e.g., boiled or treated) water before leaving each survey site.
 - ii. Boots, nets, traps, etc., must be scrubbed with 70 percent alcohol (isopropyl or ethanol) or 3 to 6 percent sodium hypochlorite, and thoroughly rinsed with clean tap water between survey sites. Avoid cleaning equipment in the immediate vicinity of a pond or wetland.
 - iii. In remote locations, clean all equipment as described above upon return to the lab or base camp. Elsewhere, when washing machine facilities are available, remove nets from poles and wash with bleach on the delicates cycle, within a protective mesh laundry bag.
 - iv. Used cleaning materials (liquids, etc.) shall be disposed of safely at the lab. Used disposable gloves shall be retained for safe disposal in sealed bags.
- f. If the permittee observes California tiger salamanders (*Ambystoma californiense*) during the course of field surveys, the locations shall be listed as UTM coordinates in the 90-day report referenced below.
- g. Within 90 days following completion of the last field visit at each project site, a report shall be submitted to the appropriate FWO following the general reporting format specified below. The report shall include all reporting criteria specified in the current Guidelines unless otherwise specified below:
 - i. Each survey report submitted to the Service shall include the following:
 - A. An introduction section addressing reasons and objectives for taking the species;
 - B. Methodology section addressing data collection and analysis procedures, the names of personnel, and the number and dates of surveys;
 - C. Results section that includes data collected (including reporting criteria specified in the Guidelines) and summarizes the data collected;

- D. Conclusion section that specifically provides recommendations for recovery of the species and any other pertinent observations made during survey efforts.
- ii. All vernal pool data sheets should be included as attachments to the final 90-day report. Vernal pool datasheets shall not solely be submitted as a final report for any one project site;
- iii. The location of the project site and survey area shall be delineated on a USGS topographic map (1:24,000 scale), and the location of the listed vernal pool branchiopods (i.e., pools, swales, ponds) delineated on a USGS topographic map in as precise a manner as possible (e.g., UTM coordinates or location within a section);
- iv. Reports submitted to the Service shall provide accurate and complete reporting of activities. Each report shall include the following certification statement and be signed by each surveyor(s) performing activities pursuant to this permit: "I certify that the information in this survey report and attached exhibits fully and accurately represents my work." The date of signature and the surveyor's permit number shall be included.

7. Taking of the San Francisco garter snake:

The permittee is authorized to harass by survey, capture, handle, mark, insert PIT tags, and release individuals within the geographic boundaries specified above, and the time limitation specified in the permit, provided that:

- a. San Francisco garter snakes may be captured by hand, by hand-held reptile stick, or by terrestrial "trap-line," which typically consists of funnel traps and drift fencing.
- b. Changes to drift fence and trap design, including materials and construction, shall be submitted to the SFWO for review and written approval (e.g., via electronic mail) at least 30 days prior to the initiation of any new activity.
- c. All traps shall be inspected for San Francisco garter snakes daily, unless circumstances (e.g., climate) dictate the need for more frequent inspection. Traps shall contain a water (moisture) source for incidentally captured amphibians (e.g., sponge in a petri-style dish, etc.).
- d. All San Francisco garter snakes shall be released promptly at the point of capture unless release would cause the individual to be injured or killed, and then the individual shall be released as close to the point of capture as possible.

- e. Morphological data is to be collected on all snakes. Individuals may be held only as long as necessary to be weighed, measured, sexed, photographed, marked by a ventral scute clip or by micro-branding. If a San Francisco garter snake exhibits signs of physiological stress (e.g., lack of response to stimuli), it shall be released immediately at the point of capture. All individuals shall be photographed (dorsal, ventral, lateral, and head with ruler reference) prior to release.
 - f. The permittee is authorized to mark (by clipping the ventral scute or micro-branding) and PIT-tag all individual San Francisco garter snakes at a given site:
 - i. No snake under 15 centimeters snout/vent length (SVL) shall have ventral scutes clipped for identification.
 - g. Prior to independently performing ventral scute marking or micro-branding, individuals shall have verifiable experience conducting this procedure, or have been observed performing this procedure on at least 12 San Francisco garter snakes by an experienced, permitted individual. Any individual independently PIT-tagging San Francisco garter snakes must have demonstrated prior experience with no less than 25 individuals of another similar species of snake with at least 12 of these snakes being hatchling/small juveniles, or have been observed implanting PIT tags in at least 25 San Francisco garter snakes, of which 12 must have been small individuals (e.g., 15 cm snout vent length), by an experienced, permitted individual. These individuals must also be named on the List accompanying the permit.
8. Taking of the Alameda whipsnake (whipsnake):
- The permittee is authorized to harass by survey, capture, handle, mark, insert PIT tags, and release within the geographic boundaries specified above, and the time limitation specified in the permit, provided that:
- a. Whipsnakes may be captured by hand, by hand-held reptile stick, or by terrestrial “trap-line,” which typically consists of funnel traps and drift fencing.
 - b. The number of adults and sub-adults that may captured, measured, marked, photographed, and PIT-tagged is 250 individuals per sub-population, locality, or distinct site.
 - c. Changes to drift fence and trap design, including materials and construction, shall be submitted to the SFWO (e.g., via electronic mail) for review and approval at least 30 days prior to the initiation of any new activity.
 - d. All traps shall be inspected daily regardless of weather conditions. In hot weather (temperatures predicted above 82 degrees Fahrenheit in the study area), all traps shall be inspected no later than 1330 hours, and no sooner than 1200 hours. Traps

in the warmest part of the study area shall be checked first. During warm weather (temperatures predicted below 82 degrees Fahrenheit in study area), traps will be checked later in the day, beginning 1330 or later.

- e. All whipsnakes shall be released promptly at the point of capture unless release would cause the individual to be injured or killed, and then the individual shall be released as close to the point of capture as possible.
- f. Morphological data is to be collected on all whipsnakes. Individuals may be held only as long as necessary to be weighed, measured, sexed, photographed, and marked by a ventral scute clip or micro-brand. If a whipsnake exhibits signs of physiological stress (e.g., lack of response to stimuli), it shall be released immediately at the point of capture. All individuals shall be photographed (dorsal, ventral, lateral, and head with ruler reference) prior to release.
- g. The permittee is authorized to mark (by clipping the ventral scute or micro-brand) all individual whipsnakes at any given site; and PIT-tag up to 250 whipsnakes per site throughout the range of the species, provided that no snake under 15 cm snout/vent length (SVL) shall have ventral scutes clipped for identification.
- h. During surveys, the following data will be recorded: (i) survey information including date, time, effort (number of trap hours, searching hours, traps, etc.), weather conditions at start and end of survey, number of acres or linear feet surveyed, and other appropriate information as deemed necessary to adequately describe the survey; and (ii) site description including habitat types and approximate acreage of each, size and location of freshwater areas, soil classification, topography/elevation, and surrounding land-use activity.
- i. If the purpose of the activity is research to obtain data regarding whipsnakes, with the immediate release of the snake, the following step-down procedures shall be used: (i) any individual independently PIT-tagging whipsnakes must have demonstrated prior experience with no less than 25 individuals of another similar species of snake with at least 12 of these snakes being hatchling/small juveniles, or have been observed implanting PIT tags in at least 25 whipsnakes, of which 12 must have been hatchlings/small juveniles, by an experienced, permitted individual. All individuals referenced above must be named on the List pursuant to condition number 5 above.
- j. Prior to independently performing ventral scute marking or micro-branding, individuals shall have verifiable experience conducting this procedure, or have been observed performing this procedure on at least 12 Alameda whipsnakes by an experienced, permitted individual. These individuals must also be named on the List accompanying the permit.

- k. Baseline presence surveys must be conducted during the active period of the whipsnake immediately preceding the start of habitat management activities and an estimate of the population size must be determined.

9. Taking of the frog:

The permittee is authorized to harass by survey, capture, handle, and release individuals within the geographic boundaries specified above, and the time limitation specified in the permit, provided that:

- a. Capture methods shall follow commonly accepted techniques for amphibian field sampling, including: (i) capture by hand (wet hands only); (ii) dip-netting; (iii) seining; (iv) scooping up by container; and (v) using approved traps including cast nets. If minnow traps are used, they shall be checked at intervals not to exceed 12 hours. Minnow traps shall not be used when metamorphic and adult frogs may be present unless the traps can be placed in a manner that would allow captured individuals to gain ready access to the surface to prevent drowning.
- b. All handling of frogs must adhere to the following measures:
 - i. Amplexing pairs of frogs shall not be captured, handled, or disturbed.
 - ii. No egg masses may be harassed in any manner for any activity authorized in this permit.
 - iii. All handling shall be done in an expedient manner with minimal harm to the individuals being handled. The hands and arms of all workers handling frogs shall be free of lotions, creams, sunscreen, oils, ointment, insect repellent, or any other material that may harm frogs. Handling of frogs shall be done with wet hands.
 - iv. The permittee shall contact the SFWO prior to collecting morphological data to obtain the most recent information about what morphological data is most valuable to collect and the most appropriate collection and recording techniques.
 - v. If captured frogs exhibit signs of distress (e.g., lack of response to stimuli or erratic behavior), they shall be immediately released at the point of capture.
 - vi. All captured frogs shall be released at the point of capture unless that location puts them in imminent danger, in which case they shall be placed in a nearby refuge sufficient to protect them.

- vii. Larval frogs shall not be handled out of the water for longer than 30 seconds, unless rewetted, and shall not be retained for longer than 5 minutes for processing.
 - viii. Frogs may be held temporarily in captivity on a case by case basis with prior approval (e.g., email) from the appropriate FWO. Animals shall be transported according to accepted methods, in moist cloth bags or in terrarium with moisture gel or non-cellulose sponge to minimize desiccation.
- c. In an effort to minimize the spread of pathogens that may be transferred as a result of permitted activities, surveyors shall follow the guidance outlined below for disinfecting equipment and clothing after entering a pond and before entering a new pond, unless the wetlands are hydrologically connected to one another.
- i. All organic matter shall be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water or potentially contaminated sediments. Cleaned items shall be rinsed with clean water before leaving each study site.
 - ii. Boots, nets, traps, hands, etc. shall be scrubbed with either a 75 percent ethanol solution, a bleach solution (0.5 to 1.0 cup per 1.0 gallon of water), Quat-128™ (1:60), or a 3 to 6 percent sodium hypochlorite solution and thoroughly rinsed clean with water between study sites. Cleaning equipment in the immediate vicinity of a pond or wetland shall be avoided clean in an area at least 100 feet from aquatic features). Care shall be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.
 - iii. Used cleaning materials (liquids, etc.) shall be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves shall be retained for safe disposal in sealed bags.
 - iv. Additionally, the surveyors shall implement the following when working at sites with known or suspected disease problems: disposable gloves shall be worn and changed between handling each animal. Gloves shall be wetted with water from the site or distilled water prior to handling any amphibians. Gloves should be removed by turning inside out to minimize cross-contamination.
- d. During surveys the following data shall be recorded, at a minimum: (i) survey information including date, time, effort, weather conditions at start and end of survey, number of acres or linear feet surveyed, and other appropriate information

as deemed necessary to adequately describe the survey; and (ii) site description including habitat types including approximate acreage of each, size and location of freshwater areas, soil classification, topography/elevation, presence of non-native predators, and surrounding land-use activity.

9. Taking of the tiger salamander:

The permittee is authorized to capture, handle, and release larvae, juveniles, and adults of the tiger salamander at any one site within the geographic boundaries specified above, and the time limitations specified in this permit, provided that:

- a. The permittee has submitted and received approval from the appropriate FWO to survey a given site. The permittee's request to survey shall include a description of the site to be surveyed, maps or aerial photos of the site, and a diagram of the layout of the traps and drift fences. Requests to survey shall be submitted at least 45 days prior to the desired commencement of surveys.
- b. Capture of larval tiger salamanders in ponds is achieved via dip-netting with standard aquatic nets, minnow traps, cast nets, seines, and umbrella seines in the following manner:
 - i. Capture of tiger salamanders in ponds shall be done in a manner to avoid disturbing tiger salamander eggs. Sampling shall be conducted between March and May. The permittee shall use dipnets with a maximum mesh size of 3.2 millimeters, however, a mesh size of 2 millimeters is advised due to the possibility of newly hatched tiger salamander larvae passing through larger mesh sizes. If tiger salamander eggs are encountered after these dates, surveys shall cease until eggs have hatched.
 - ii. The permittee must receive prior approval from the appropriate FWO prior to using minnow traps. Minnow traps shall be deployed overnight and checked frequently enough to ensure that larvae are not killed or injured and do not exhibit signs of physiological stress due to low oxygen levels. The frequency will have to be determined empirically for each site, but shall not exceed 24 hours between inspections.
 - iii. The necessity of sampling in ponds shall be evaluated on a case-by-case basis. Sampling in ponds shall be done after a point in time when most larvae in the pond have grown sufficiently that they can avoid being trampled. When possible, sampling shall be done in ways that do not disturb the pond's bottom. Shallow areas where young larvae may occur shall be avoided when walking or pulling nets. If such areas must be crossed, they shall be traversed in the most direct and least disturbing manner possible.

- iv. In an effort to minimize the spread of pathogens that may be transferred as result of these surveys, surveyors shall follow the guidance outlined below for disinfecting equipment and clothing after surveying a pond and before entering a new pond, unless the wetlands are hydrologically connected to one another.
 - A. All organic matter shall be removed from nets, traps, boots, vehicle tires, and all other surfaces that have come into contact with water or potentially contaminated sediments. Cleaned items shall be rinsed with clean water before leaving each study site.
 - B. Boots, nets, traps, etc., shall then be scrubbed, sprayed, or dipped in either a 70 percent ethanol solution, a bleach solution (0.5 to 1.0 cup per 1.0 gallon of water), Virkon diluted to 1 gram/liter (3.78 gram per gallon of water), or Quat-128 (1 ounce per gallon of water) and rinsed clean with water between study sites. Cleaning equipment in the immediate vicinity of a pond or wetland shall be avoided. Care shall be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.
 - C. When working at sites with known or suspected disease problems, disposable gloves shall be worn and changed between handling each animal. Gloves shall be wetted with water from the site or distilled water prior to handling any amphibians. Gloves shall be removed by turning inside out to minimize cross-contamination.
 - D. Used cleaning materials (liquids, etc.) shall be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves shall be retained for safe disposal in sealed bags.
 - v. The permittee shall use the Service-approved guidance for surveying for tiger salamanders once this guidance becomes available, except where this permit allows for divergence from the guidance.
- c. Capture of adult and juvenile tiger salamanders in terrestrial habitats is achieved by hand-capturing or through the use of drift fences and pitfall traps in the following manner:
- i. Pitfall traps shall not be placed in a manner that will disturb or destroy rodent burrows or other refugia (e.g., logs, fissures, etc.) that could be used by tiger salamanders.
 - ii. All pitfall traps shall be fitted with a lid that closes securely. When not in use, the lids shall be closed in a manner that precludes entry by tiger

salamanders and other species. If vandalism occurs, a mechanism for securing the lids in place shall be implemented to assure the pitfall traps are not opened outside of active survey periods.

- iii. Each pitfall trap shall be a cylindrical, non-galvanized metal or plastic container. They shall be at least 8 inches (20 centimeters) deep.
- iv. Each pitfall trap shall contain non-cellulose sponges or other nontoxic absorbent material that shall be kept moist at all times in order to provide a source of moisture for trapped animals.
- v. When open, each pitfall trap shall have a rigid cover supported 1 to 2 inches high to provide access for moving tiger salamanders as well as cover from weather. The cover shall be designed such that it prevents predator access.
- vi. When in use, the permittee shall check each pitfall trap as often as necessary and at a minimum of once per day with one of these checks occurring between 1 hour before sunrise and noon. Whenever possible traps shall be opened just before dark and checked and closed the following morning.
- vii. Captured tiger salamanders shall be released as near as possible to the point of capture, in a manner that maximizes their survival. Tiger salamanders shall be released into the mouth of a small mammal burrow or other suitable refugia. Tiger salamanders shall be watched after release to be sure that they are in a safe location and are not susceptible to increased predation risk.
- viii. Pitfall traps shall be placed as far as possible from ant nests. If an ant nest develops within 10 feet of an existing pitfall trap, the pitfall trap shall be moved, removed from the field, or closed.
- ix. If marking of tiger salamanders is necessary, only a single toe shall be clipped per individual. A description of the rationale and methodology for toe-clipping individual tiger salamanders shall be included in the proposal to conduct research, as required by condition number 4 above.
- x. The permittee shall carefully lift cover (e.g., logs and other debris) from burrows and other refugia to prevent injury to any tiger salamanders and shall replace it to its original position.
- xi. Digging or other disturbance to the structural integrity of burrows or other refugia is prohibited.

- xii. Activities that would result in small mammals abandoning burrows potentially used as refugia by tiger salamanders are prohibited.
- d. All handling of tiger salamanders must adhere to the following measures:
- i. All handling shall be done in an expedient manner with minimal harm to the individuals being handled. The hands and arms of all workers handling tiger salamanders shall be free of lotions, creams, sunscreen, oils, ointment, insect repellent, or any other material that may harm tiger salamanders.
 - ii. If captured tiger salamanders exhibit signs of physiological distress, they shall be immediately released at the point of capture.
 - iii. All captured tiger salamanders shall be released at the point of capture unless that location puts them in imminent danger, in which case they shall be placed in a refugium sufficient to protect them.
 - iv. All tiger salamanders shall be maintained at or near the site of capture in a manner that optimizes their survival.
 - v. Tiger salamanders shall not be marked unless approved in writing by the VFWO or the SFWO depending on location.
- e. Photographs shall serve as voucher specimens unless otherwise approved by the appropriate FWO. In instances where collection of voucher specimens is authorized, they are to be collected in the following manner:
- i. Specimens shall be taken only from new breeding localities or from localities that have not been validated for more than 10 years.
 - ii. Only one larval tiger salamander shall be removed from any such site.
 - iii. The permittee shall preserve voucher specimens in accordance with standard museum practices and deposit them at a designated depository, listed below.
- f. The appropriate FWO shall be informed by written notification of all new localities for the tiger salamander within 2 days of their discovery. Within 1 week of identification of a new locality, the information shall be submitted to the California Natural Diversity Database and the appropriate FWO.
10. The number of individuals allowed to be incidentally injured or killed during permitted activities is 10 individuals of each vernal pool branchiopod species (and an unquantifiable

number of eggs), zero garter snakes, zero whipsnakes, 5 frogs, and 1 tiger salamander per breeding site/locality, in any calendar year.

- a. Any incidental injury or killing must be reported within 3 working days to the Region 8 Office and the appropriate FWO.
 - b. In the event that the number of individuals allowed to be incidentally injured or killed is exceeded during the performance of permitted activities, the permittee must:
 - i. Immediately cease the activity resulting in injury or death until reauthorized by the Region 8 Office, which may, after analysis of the circumstances of mortality or injury, revoke or amend this permit.
 - ii. Immediately notify the Region 8 Recovery Permit Coordinator (telephone: 760-431-9440; fax: 760-930-0846) and the appropriate FWO. The permittee must follow-up such verbal notification in writing to each office.
 - iii. With the written notification, the permittee is to provide a report of the circumstances that led to the injury or mortality. A description of the changes in protocols that will be implemented to reduce the likelihood of such injury or mortality from happening again should be included, if appropriate. A copy of this report shall also be sent to the California Department of Fish and Game (CDFG), Attention: Permitting Biologist, Wildlife Branch, 1812 Ninth Street, Sacramento, California 95811 (telephone: 916-653-4875).
 - c. The appropriate parts of any dead specimen shall be preserved in accordance with standard museum practices. Before expiration of the permit, all preserved specimens shall be properly labeled and deposited with one of the designated depositories. The permittee shall supply the depository with a copy of this permit to validate that the specimens supplied to the museum were taken pursuant to a permit.
11. The permittee is authorized to salvage all vernal pool branchiopods, garter snake, whipsnake, frog, and tiger salamander carcasses to be provided to one of the designated depositories listed below.
12. Designated depositories:
- a. For the vernal pool branchiopods:

The California Academy of Sciences, Golden Gate Park, San Francisco, California; the Los Angeles County Museum of Natural History, Los Angeles,

California; the SFWO; the CFWO; or any other institution designated in writing by the SFWO.

- b. For the garter snake, frog, and tiger salamander:

The Museum of Vertebrate Zoology, University of California, Berkeley, California; the Vertebrate Museum, California State University, Hayward, California; the Vertebrate Museum, California State University, San Jose, California.

13. California Natural Diversity Database forms shall be completed, as appropriate, for each listed species addressed herein and submitted to the Biogeographic Data Branch, CDFG, 1807 13th Street, Suite 202, Sacramento, California 95811 (also accessible online at: <http://www.dfg.ca.gov/biogeodata/cnddb>), with copies submitted to the appropriate FWO.

All reports or other documents which include information gathered under the authority of this permit (e.g., reports prepared by consulting firms for their clients) shall reference this permit. Copies of such documents shall be provided to the appropriate FWO upon their completion. Draft documents and other information resulting from work conducted under the authority of this permit shall be submitted to the Service upon request.

14. Annual reports:

Annual reports shall be submitted to the Recovery Permit Coordinator at each appropriate FWO by January 31, following each year this permit is in effect. Specifically, part 14(a) below is required as applicable and part 14(b) below is required as specified:

- a. As applicable, for any research or monitoring activity authorized pursuant to this recovery permit and/or for any activity conducted for each species authorized pursuant to this permit that does not have a previously required reporting obligation as stated in survey protocols, survey guidelines, or previously specified in this permit, the permittee shall submit an annual report in the following format: (i) an introduction section addressing reasons and objectives for taking the species; (ii) a methodology section addressing data collection and analysis procedures; (iii) a results section that summarizes the data collected including any information on any other federally listed species detected while conducting activities authorized under this permit; and (iv) a conclusion section that specifically provides recommendations for recovery of the species. If no activities occurred over the course of a year, indication of such shall be submitted as an annual report. Information may be submitted electronically if pre-arranged with the Recovery Permit Coordinator.

The annual report shall include, but not be limited to:

- i.. Summary presentations and brief discussions of research and/or monitoring results;
 - ii. Locations sampled or survey/monitoring area delineated on a 7.5 minute U.S. Geological Survey topographic map at 1:2400 scale. The name of the USGS map identified;
 - iii. The names of all personnel conducting the activity and associated permit numbers.
 - iv. The results of all sampling efforts, including estimates of population sizes and genetic analyses (if applicable);
 - v. Reports or other documents that include information gathered under the authority of this permit;
 - vi. Numbers of individuals incidentally killed, including dates, locations, circumstances of take, and depository receiving the preserved specimen(s);
 - vii. Other pertinent observations made during sampling efforts regarding the status or ecology of the species; and
 - viii. Planned future activities if authorized under this permit.
- b. Required for all species authorized pursuant to this permit:
- i. An annual report of activities shall be submitted to each FWO the permittee is authorized (as specified in term and condition number 4 above) by January 31, following each year this permit is in effect. The report should provide a summary for each focused survey and/or permitted activity conducted during the previous calendar year for all species authorized pursuant to this permit. This annual report shall include, but not be limited to: (a) the title of the project (preferably the same title as was used in any survey, research, monitoring or other required report previously or concurrently being submitted to the Service), (b) the specific location of the project site, including the County, (c) the common and scientific names of the listed species for which the permitted activity was conducted, (d) the numbers of each species observed and the dates of observation, (e) the date and name of the Service office where the survey, research, or monitoring report was or will be submitted, and (f) include the permittees name, permit number, and date of permit expiration. This information can be in tabular format and should provide a summary for all species authorized in the permit.
 - ii. If no activities were conducted with any or all species authorized under the permit during the previous year, please state this in writing in your annual report.

15. Failure to comply with reporting requirements may result in non-renewal or suspension/revocation of this permit.

4/15/08
Date

M. P. F. M.
Endangered Species Program Manager



United States Department of the Interior



FISH AND WILDLIFE SERVICE
California and Nevada Region
2800 Cottage Way, Suite W-2606
Sacramento, California 95825-1846

LIST OF AUTHORIZED INDIVIDUALS TE-016591-5

1. Individual authorized to independently conduct activities pursuant to this permit:

Wendy Dexter.
2. Individuals authorized to independently conduct surveys for the garter snake, the whip snake, the red-legged frog, and the tiger salamander pursuant to this permit:

Jeff Alvarez.
3. Individuals authorized to independently conduct surveys for the tiger salamander pursuant to this permit:

Sarah Foster.

Supervised individuals may conduct activities pursuant to this permit only under the direct on-site supervision of an individual authorized to independently conduct activities listed above. On-site supervision is defined as an unauthorized individual conducting activities within 3 meters (9.8 feet) of an authorized individual.

4/15/08
Date

Mel F...
Endangered Species Program Manager

This List is only valid if it is dated on or after the permit issuance date.

APPENDIX B

DATASHEETS

July 16, 2010



**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: 02/04/2010 Time: 12:15 County: Alameda Quad: Midway

Collector(s): W. Dexter Permit #: TE-016591-5.1

Site/Project Name: Site 300: Bldg 850 Enhancement Pool Pool #: FS-1

Township: 3S Range: 4E Section: NE of 17 37.67203° lat. -121.56666° long.

Temperature: Water: _____ °C Air: ~15 °C no thermometer

Pool Depth: Surface Area:

at time of sampling: 16.5 cm at time of sampling: 1 m x 0.5 m

estimated maximum: 122 cm estimated maximum: 8 m x 20 m

Habitat Condition: (circle where appropriate)

- undisturbed

disturbed: tire tracks

garbage

discing/plowing

burning

ungrazed

grazed: cattle

horses

sheep

other _____

light

moderate

heavy

- land use of habitat:

wildlife habitat / experimental ignition device testing

(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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

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

Insects: (adult or larvae)		
Anisoptera:	yes	<input checked="" type="radio"/> no
Zygoptera:	yes	<input checked="" type="radio"/> no
Hydrophilidae:	yes	<input checked="" type="radio"/> no
Dytiscidae:	yes	<input checked="" type="radio"/> no
Corixidae:	yes	<input checked="" type="radio"/> no
Notonectidae:	yes	<input checked="" type="radio"/> no
Belostomatidae:	yes	<input checked="" type="radio"/> 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 #

**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: 2/19/200 Time: _____ County: Alameda Quad: Midway

Collector(s): W. Dexter Permit #: TE-016591-5.1

Site/Project Name: UNL Pool #: 1

Township: 3S Range: 4E Section: NE of 17 ^{37.67203°} lat. -121.56666° long.

Temperature: Water: 12 °C Air: 14 °C

Pool Depth: Surface Area:

at time of sampling: 7.6 cm at time of sampling: 0.5 m x 1 m

estimated maximum: _____ cm estimated maximum: _____ m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed

disturbed: tire tracks

garbage

discing/plowing

berm @ road

ungrazed

grazed: cattle

horses

sheep

other _____

light

moderate

heavy

- land use of habitat:

National security

(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)

Anostracans: (note reproductive status) possible LIOC (all were dead)

Notostracans: (note reproductive status) none

(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>
possible LIOC	4	already dead	

**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: 3/5/10 Time: 10:30 County: Alameda Quad: Midway

Collector(s): W. Dwyer Permit #: TE-016591-5.1

Site/Project Name: Site 300 Pool #: 1

Township: 3S Range: 4E Section: NE of 17 37.67203° lat. -121.56666° long.

Temperature: Water: 9.9 °C Air: 11.6 °C

Pool Depth: Surface Area:

at time of sampling: 40.6 cm at time of sampling: 8 m x 16 m

estimated maximum: _____ cm estimated maximum: _____ m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed	<input checked="" type="checkbox"/> disturbed	tire tracks	garbage	discing/plowing	<u>road berm</u>
- <input checked="" type="checkbox"/> ungrazed	grazed:	cattle	horses	sheep	other _____
			light	moderate	heavy

- land use of habitat: explosives testing / 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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(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) *Chironomids yes*

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

Species

Individuals

Accession/Catalog #

Pool #

**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: 3/19/10 Time: _____ County: Alameda Quad: Midway

Collector(s): W. Dexter Permit #: TE-016591-5.1

Site/Project Name: SITE 300 Pool #: 71

Township: 3S Range: 4E Section: NE-17 37.67203 lat. -121.5660 long.

Temperature: Water: 11 oC Air: 16.5 oC

Pool Depth: Surface Area:

at time of sampling: 61 cm at time of sampling: _____ m x _____ m *see previous*

estimated maximum: _____ cm estimated maximum: _____ m x _____ 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:

National Security

(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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(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.

Species

Individuals

Accession/Catalog #

Pool #

**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: 04/02/10 Time: _____ County: Alameda Quad: _____
Collector(s): W. Dexter Permit #: TE-016591-51
Site/Project Name: UNL - Site 300 Pool #: 1

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

Temperature: Water: 7.5 oC Air: 9 oC

Pool Depth: Surface Area:

at time of sampling: 34 cm at time of sampling: _____ m x _____ m

estimated maximum: _____ cm estimated maximum: _____ m x _____ 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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

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

Insects: (adult or larvae)

Anisoptera:	yes	<i>no</i>
Zygoptera:	yes	<i>no</i>
Hydrophilidae:	yes	<i>no</i>
Dytiscidae:	yes	<i>no</i>
Corixidae:	yes	<i>no</i>
Notonectidae:	yes	<i>no</i>
Belostomatidae:	yes	<i>no</i>
Other (specify) <i>Chironomid</i>	<i>yes</i>	
<i>fantomidge</i> <i>(Chaoboridae)</i>	<i>yes</i>	

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

Species

Individuals

Accession/Catalog #

Pool #

**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: 04/16/2010 Time: 10:40 County: _____ Quad: _____
Collector(s): W. Dexter Permit #: TE-016591-5.1
Site/Project Name: SITE 300 Pool #: 1

Township: _____ Range: _____ Section: _____ lat. _____ long. _____
Temperature: Water: 15 oC Air: _____ oC

Pool Depth: Surface Area:
at time of sampling: 43 cm at time of sampling: 5 m x 12 m
estimated maximum: _____ cm estimated maximum: _____ m x _____ m

Habitat Condition: (circle where appropriate)

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

(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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

Cladocerans:	yes	<input checked="" type="radio"/> no	Insects: (adult or larvae)	
Conchostracans:	yes	<input checked="" type="radio"/> no	Anisoptera:	yes <input checked="" type="radio"/> no
Copepods:	yes	<input checked="" type="radio"/> no	Zygoptera:	yes <input checked="" type="radio"/> no
Ostracods	<input checked="" type="radio"/> yes	no	Hydrophilidae:	yes <input checked="" type="radio"/> no
Fish	yes	<input checked="" type="radio"/> no	Dytiscidae:	yes <input checked="" type="radio"/> no
Frogs	<input checked="" type="radio"/> yes	no	Corixidae:	<input checked="" type="radio"/> yes no
Salamanders	yes	<input checked="" type="radio"/> no	Notonectidae:	yes <input checked="" type="radio"/> no
Waterfowl	yes	<input checked="" type="radio"/> no	Belostomatidae:	yes <input checked="" type="radio"/> no
Other (specify) _____			Other (specify) <i>culicid</i>	<i>yes</i>
			<i>Clironomid</i>	<i>yes</i>
			<i>Chaobatr</i>	<i>yes</i>

pair of eggs
1 A ♂

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

Species

Individuals

Accession/Catalog #

Pool #

Branchiopod Field Data Sheet

Site Name: *SITE 300*
 County: *Alameda*
 Date: *4/30/2010*
 Weather: *Sunny ~14°C*
 Investigator(s): *W. Dexter*

Habitat Types:
 VP = Vernal Pool
 SP = Stock Pond
 VS = Vernal Swale
 SW = Seasonal Wetland

Habitat Modifier:
 b = bermed
 a = artificially created
 p = plowed
 r = rut in road

TE-014591-5.1

Pool Number		1																			
Habitat Type		VP																			
Depth (cm)		30.5																			
Temperature (Deg. C)		13.5																			
Conductivity X1000		—																			
pH		—																			
DO (mg/l)		—																			
Crustacea	Large Branchiopods	<i>Branchinecta</i>																			
		<i>Eubranchipus</i>																			
		<i>Streptocephalus</i>																			
		<i>Thamnocephalus</i>																			
		<i>Linderiella</i>																			
		<i>Lepidurus packardii</i>																			
		<i>Cyzicus californicus</i>																			
	Ostracods		C																		
	Copepoda	Calanoidia																			
		Cyclopoda																			
Cladocera																					
Insecta	Coleoptera	Dyticidae																			
		Hydrophilidae																			
		<i>Berosus</i> sp.																			
		Hydroptillidae																			
	Hemiptera	Notonectidae																			
		Corixidas	R																		
	Ephemeroptera																				
	Odonata	Zygoptera	NC																		
		Anisoptera																			
	Diptera	Culicidae	C																		
Chironomidae		R																			
Mollusc	Lymnaeidae																				
	Physidae																				
	Planoridae																				
Microturbularian																					
Amphibia	<i>Ambystoma californica</i>																				
	<i>Bufo boreas</i>	<i>Jade</i>	VC																		
	<i>Hyla regilla</i>																				
	<i>Spea hammondi</i>																				
	<i>Gambusia affinis</i>																				
Other																					

many fig.

Abundance: R = Rare (2 or fewer) NC = Not Common (3-10) C = Common (11-50)
 VC = Very Common (50-100) A = Abundant (>100) X = Present, but not in sample

**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: 5/14/2010 Time: 10:30 County: Alameda Quad: _____
Collector(s): W. Dexter Permit #: TE-016591-5.1
Site/Project Name: SITE 300 Pool #: 1

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

Temperature: Water: N/A oC Air: 21.5 oC

Pool Depth: Surface Area:

at time of sampling: 0 cm at time of sampling: 0 m x 0 m *pool dry*

estimated maximum: _____ cm estimated maximum: _____ m x _____ 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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(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.

Species

Individuals

Accession/Catalog #

Pool #

**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: 02/04/2010 Time: _____ County: San Joaquin Quad: Tracy

Collector(s): W. DeWitt Permit #: TE-016591-5.1

Site/Project Name: Site 300: Bldg. 850 Enhancement Pool Pool #: FS-2

Township: 3S Range: 4E Section: SE of 26 37.63658° lat. -121.49549° long.

Temperature: Water: _____ °C Air: _____ °C no thermometer

Pool Depth: Surface Area:

at time of sampling: 46 cm at time of sampling: 6 m x 20 m

estimated maximum: 100 cm estimated maximum: _____ m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed	<input checked="" type="checkbox"/> disturbed:	tire tracks	garbage	discing/plowing	<u>heavily silted</u>
<input checked="" type="checkbox"/> ungrazed	grazed:	cattle	horses	sheep	other _____
			light	moderate	heavy

- land use of habitat:

experimental testing of explosives ignition devices

(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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(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) Chironomid larvae

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

Species

Individuals

Accession/Catalog #

Pool #

**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: 2/19/2010 Time: 1:45 County: San Joaquin Quad: Tracy

Collector(s): W. Dexter Permit #: TE-016591-5.1

Site/Project Name: LLNL - Site 300 Pool #: 2

Township: 3S Range: 4E Section: SE of 26 37.63658° lat. -121.49549° long.

Temperature: Water: _____ °C Air: 14 °C

Pool Depth: Surface Area:

at time of sampling: 12.7 cm at time of sampling: 17 m x 10 m

estimated maximum: _____ cm estimated maximum: _____ m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed	<input checked="" type="checkbox"/> disturbed:	tire tracks	garbage	discing/plowing	<u>bermed @ road</u>
<input checked="" type="checkbox"/> 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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

Cladocerans:	yes	<input checked="" type="radio"/> no	Insects: (adult or larvae)		
Conchostracans:	yes	<input checked="" type="radio"/> no	Anisoptera:	yes	<input checked="" type="radio"/> no
Copepods:	yes	<input checked="" type="radio"/> no	Zygoptera:	yes	<input checked="" type="radio"/> no
Ostracods	<input checked="" type="radio"/> yes	no	Hydrophilidae:	yes	<input checked="" type="radio"/> no
Fish	yes	<input checked="" type="radio"/> no	Dytiscidae:	yes	<input checked="" type="radio"/> no
Frogs	<input checked="" type="radio"/> yes	no	Corixidae:	<input checked="" type="radio"/> yes	no
Salamanders	yes	<input checked="" type="radio"/> no	Notonectidae:	<input checked="" type="radio"/> yes	no
Waterfowl	yes	<input checked="" type="radio"/> no	Belostomatidae:	yes	<input checked="" type="radio"/> no
Other (specify) _____			Other (specify) _____		

Spea hammondi
\$ 99
⊙

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

Species

Individuals

Accession/Catalog #

Pool #

**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: 3/5/10 Time: 12:00 County: San Joaquin Quad: Tracy

Collector(s): W. Dwyer Permit #: TE-016591-5.1

Site/Project Name: Site 300 Pool #: 2

Township: 3S Range: 4E Section: SE 04 26 37.63658° lat. -121.49549° long.

Temperature: Water: _____ oC Air: _____ oC

Pool Depth: Surface Area:

at time of sampling: 61 cm at time of sampling: _____ m x _____ m

estimated maximum: _____ cm estimated maximum: _____ m x _____ 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)

Anostracans: (note reproductive status)

Notostracans: (note reproductive status)

} none

(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) _____

spadefoot tad

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) Chironomids yes

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

Species

Individuals

Accession/Catalog #

Pool #

**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: 03/19/2010 Time: 9:25 County: San Joaquin Quad: Midway/Altamont?

Collector(s): W. Dexter Permit #: TE-016591-5.1 Tracy

Site/Project Name: Site 300 Pool #: 2

Township: 3S Range: 4E Section: SE of 26 37.63658 lat. -121.49549 long.

Temperature: Water: 11 oC Air: 16.5 oC

Pool Depth: Surface Area:

at time of sampling: 27.9 cm at time of sampling: ___ m x ___ m see narrow

estimated maximum: ___ cm estimated maximum: ___ m x ___ 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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

Cladocerans: yes no

Conchostracans: yes no

Copepods: yes no

Ostracods yes no

Fish yes no

Frogs yes no *spade-foot toads*

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) *Chironomid* yes

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

Species

Individuals

Accession/Catalog #

Pool #

**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: 04/22/10 Time: 8:40 County: San Joaquin Quad: _____

Collector(s): W. Dexter Permit #: TE 016591-5.1

Site/Project Name: LLNL - Site 300 Pool #: 2

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

Temperature: Water: 8 °C Air: 9.5 °C

Pool Depth: Surface Area:

at time of sampling: 13 cm at time of sampling: _____ m x _____ m

estimated maximum: _____ cm estimated maximum: _____ m x _____ 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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

Cladocerans:	<input checked="" type="radio"/> yes	<input type="radio"/> no	Insects: (adult or larvae)	
Conchostracans:	yes	<input checked="" type="radio"/> no	Anisoptera:	yes <input checked="" type="radio"/> no
Copepods:	yes	<input checked="" type="radio"/> no	Zygoptera:	yes <input checked="" type="radio"/> no
Ostracods	<input checked="" type="radio"/> yes	<input type="radio"/> no	Hydrophilidae:	yes <input checked="" type="radio"/> no
Fish	yes	<input checked="" type="radio"/> no	Dytiscidae:	yes <input checked="" type="radio"/> no
Frogs	<input checked="" type="radio"/> yes	<input type="radio"/> no	Corixidae:	<input checked="" type="radio"/> yes <input type="radio"/> no
Salamanders	<input checked="" type="radio"/> yes	<input type="radio"/> no	Notonectidae:	<input checked="" type="radio"/> yes <input type="radio"/> no
Waterfowl	yes	<input checked="" type="radio"/> no	Belostomatidae:	yes <input checked="" type="radio"/> no
Other (specify) _____			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 #

**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: 04/16/10 Time: 9:44 County: San Joaquin Quad: _____

Collector(s): W. Dexter Permit #: TE-016591-5.1

Site/Project Name: Site 300 Pool #: 2

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

Temperature: Water: 13 °C Air: 17 °C

Pool Depth: Surface Area:

at time of sampling: 13 cm at time of sampling: 8 m x 40 m

estimated maximum: _____ cm estimated maximum: _____ m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed
- ungrazed

disturbed: tire tracks
grazed: cattle

garbage discing/plowing
horses sheep
light moderate

other _____
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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

Cladocerans:	yes	<input checked="" type="radio"/> no	Insects: (adult or larvae)		
Conchostracans:	yes	<input checked="" type="radio"/> no	Anisoptera:	yes	<input checked="" type="radio"/> no
Copepods:	yes	<input checked="" type="radio"/> no	Zygoptera:	yes	<input checked="" type="radio"/> no
Ostracods	<input checked="" type="radio"/> yes	no	Hydrophilidae:	yes	<input checked="" type="radio"/> no
Fish	yes	<input checked="" type="radio"/> no	Dytiscidae:	yes	<input checked="" type="radio"/> no
Frogs	<input checked="" type="radio"/> yes	no - <i>western spadefoot</i>	Corixidae:	<input checked="" type="radio"/> yes	no
Salamanders	<input checked="" type="radio"/> yes	no - <i>7 tadpoles</i>	Notonectidae:	<input checked="" type="radio"/> yes	no
Waterfowl	yes	<input checked="" type="radio"/> no <i>1 larvae</i>	Belostomatidae:	yes	<input checked="" type="radio"/> no
Other (specify) _____			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 #

**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: 04/30/2010 Time: 9:20 County: San Joaquin Quad: _____

Collector(s): W. Dexter Permit #: TE-016591-5.1

Site/Project Name: SITE 300 Pool #: 2

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

Temperature: Water: 10.5 oC Air: 15 oC

Pool Depth: Surface Area:

at time of sampling: 15 cm at time of sampling: _____ m x _____ m *same as last*

estimated maximum: _____ cm estimated maximum: _____ m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- <u>ungrazed</u>	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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

Cladocerans:	yes	<input checked="" type="radio"/> no	Insects: (adult or larvae)	yes	<input checked="" type="radio"/> no
Conchostracans:	yes	<input checked="" type="radio"/> no	Anisoptera:	yes	<input checked="" type="radio"/> no
Copepods:	yes	<input checked="" type="radio"/> no	Zygoptera:	yes	<input checked="" type="radio"/> no
Ostracods:	yes	<input checked="" type="radio"/> no	Hydrophilidae:	yes	<input checked="" type="radio"/> no
Fish:	yes	<input checked="" type="radio"/> no	Dytiscidae:	<input checked="" type="radio"/> yes	no
Frogs:	<input checked="" type="radio"/> yes	no	Corixidae:	<input checked="" type="radio"/> yes	no
Salamanders:	<input checked="" type="radio"/> yes	no	Notonectidae:	yes	<input checked="" type="radio"/> no
Waterfowl:	yes	<input checked="" type="radio"/> no	Belostomatidae:	yes	<input checked="" type="radio"/> no
Other (specify) _____			Other (specify) _____		

*FEW PATT. tabs
100+ WESP. tabs
3 CTS larvae*

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

Species

Individuals

Accession/Catalog #

Pool #

**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: 5/14/10 Time: 1:15 County: San Joaquin Quad: _____
Collector(s): W. Dexter Permit #: TE-016591-51
Site/Project Name: SITE 300 Pool #: 2

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

Temperature: Water: NA °C Air: 21.5 °C

Pool Depth: Surface Area:

at time of sampling: 0 cm at time of sampling: 0 m x 0 m pool dry
estimated maximum: _____ cm estimated maximum: _____ m x _____ 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)

Anostracans: (note reproductive status) *none*

Notostracans: (note reproductive status) *none*

(Optional) Species Observations:

Cladocerans:	yes	<input checked="" type="radio"/>	Insects: (adult or larvae)		
Conchostracans:	yes	<input checked="" type="radio"/>	Anisoptera:	yes	<input checked="" type="radio"/>
Copepods:	yes	<input checked="" type="radio"/>	Zygoptera:	yes	<input checked="" type="radio"/>
Ostracods	yes	<input checked="" type="radio"/>	Hydrophilidae:	yes	<input checked="" type="radio"/>
Fish	yes	<input checked="" type="radio"/>	Dytiscidae:	yes	<input checked="" type="radio"/>
Frogs	<input checked="" type="radio"/>	no	Corixidae:	yes	<input checked="" type="radio"/>
Salamanders	yes	<input checked="" type="radio"/>	Notonectidae:	yes	<input checked="" type="radio"/>
Waterfowl	yes	<input checked="" type="radio"/>	Belostomatidae:	yes	<input checked="" type="radio"/>
Other (specify) _____			Other (specify) _____		

Spadyfo? metamorphosis
-50

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>Lots of dead tads & larvae</i>			

APPENDIX C

POOL PHOTOGRAPHS

July 16, 2010





Pool 2, December 10, 2009: Photo taken from east edge of pool looking west.



Dry Pool 1, June 2010: Photo taken from southwest looking northeast.

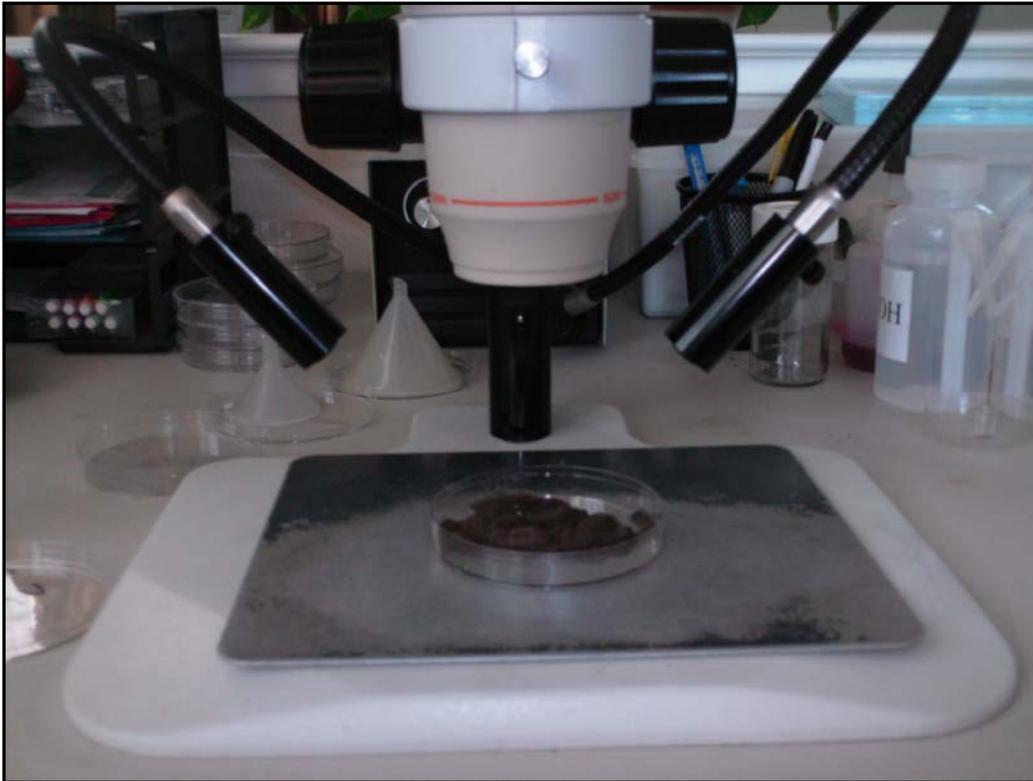
APPENDIX D

DRY SEASON SAMPLING REPORT

July 16, 2010



**SOIL EXAMINATIONS
FOR THE PRESENCE OF
FEDERALLY LISTED LARGE BRANCHIOPODS
AT THE
LAWRENCE LIVERMORE NATIONAL LABORATORY
SITE 300 EXPERIMENTAL TEST SITE**



Prepared for: **CONDOR COUNTRY CONSULTING, INC.**
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2273 Nolen Drive
Lincoln, CA 95648
Contact: Brent Helm
(916) 543-7397

July 2010



**SOIL EXAMINATIONS
FOR THE PRESENCE OF
FEDERALLY LISTED LARGE BRANCHIOPODS
AT THE
LAWRENCE LIVERMORE NATIONAL LABORATORY
SITE 300 EXPERIMENTAL TEST SITE**

INTRODUCTION

Helm Biological Consulting was contracted by Condor Country Consulting, Inc. to examine soils, collected from the Lawrence Livermore National Laboratory Site 300 Experimental Test Site, for the presence of large branchiopods (fairy shrimp, tadpole shrimp, and clam shrimp) that are listed as threatened or endangered under the federal Endangered Species Act (e.g., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]).

The Lawrence Livermore National Laboratory Site 300 Experimental Test Site is located south of Interstate 580, west of Interstate 5, and north of County Highway J2/ Tesla Road (aka. Corral Hollow Road) in San Joaquin and Alameda Counties, California (Figure 1). Soils were collected within two basins occurring at the Lawrence Livermore National Laboratory Site 300 Experimental Test Site. The first pool, OA-FS-1, is located in the southwest $\frac{1}{4}$ of the northwest $\frac{1}{4}$ of Section 17, Range 4 East, and Township 3 South of the Midway 7.5 minute U.S. Geological Survey (USGS) Quadrangle map (approximate center coordinates - Longitude: 37°40'20" North and Latitude: 121° 34'3" West). The second pool, BC-FS-2, is located in the southeast $\frac{1}{4}$ of the southeast $\frac{1}{4}$ of Section 26, Range 4 East, and Township 3 South of the Tracy 7.5 minute USGS Quadrangle map (approximate center coordinates - Longitude: 37°38'11" North and Latitude: 121°29'40" West) (Figure 1).

This report discusses the methods and results of the soil examinations for the presence of federally listed large branchiopods at the Lawrence Livermore National Laboratory Site 300 Experimental Test Site.

**Soil Examinations
Lawrence Livermore National Laboratory
Site 300 Experimental Test Site**

**Ph: (916) 543-7397
Fax: (916)543-7398**



"I certify that the information in this survey report and attached exhibits fully and accurately represent my work."

Brent P. Helm Signature  Date 7-12-10



Fairy Shrimp Survey Locations - Project Area
Lawrence Livermore National Laboratory
Site 300 Experimental Test Site

Figure 1



METHODS

Wendy Dexter of Condor Country conducted dry-season sampling on June 11, 2010 under permit TE-016591-5.1 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 U.S. Fish and Wildlife Service. Methods generally followed USFWS's *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* (1996). The collected soil was then transported to Helm Biological Consulting's laboratory for processing and analysis.

In the laboratory, a brine solution was prepared by mixing table salt (NaCl) with lukewarm tap water in a large container. The soil material was placed in the brine solution, then gently worked by hand to breakdown any persistent soil structure. The organic material rising to the top of the brine solution was skimmed off and placed in a 710-micron diameter pore-size sieve stacked atop a 75-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 soil retained from the 75-micron diameter pore size sieve was then removed and thinly (≈ 1.0 mm) spread into plastic petri dishes.

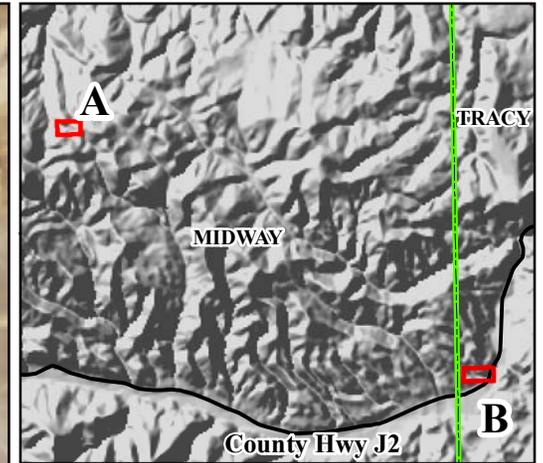
The contents of each petri dish were examined under a 10 to 252-power zoom binocular microscope. A minimum of 0.5-hour was spent searching the contents of each petri dish for large branchiopod cysts (embryonic eggs). Dr. Helm's large branchiopod cyst reference collection and scanning electron micrographs of cysts (Hill and Shepard 1998, Mura 1991, and Gilchrist 1978) were used to identify and compare any cysts observed within the soil samples.

RESULTS

Soil samples collected from two pools were examined for the presence of federally listed large branchiopods (Figure 2). No evidence of federally listed large branchiopods (i.e., large branchiopod cysts) was observed in the collected soils (Table 1). Representative photographs of the pools on site are in Appendix A.

Table 1. Results of Soil Examinations

Pool No.	Insect Exo-Skeletons	Micro-Turbellarian Cysts	Ostracods Live/Cysts/Carapaces	Nematoda Live	Collembola Live
OA-FS-1	X	X	X		
BC-FS-2	X	X	X	X	X



Legend

- Fairy Shrimp Survey Pools
- USGS 7.5' Quadrangle Boundary

Surveys located within Alameda and San Joaquin Counties, in the Midway and Tracy 7.5' USGS topographic quadrangles.
Sources: California Spatial Information Library & ESRI



Listed Branchiopod Survey Pool Locations
Lawrence Livermore National Laboratory
Site 300 Experimental Test Site

Figure 2

LITERATURE CITED

- Gilchrist, B. M. 1978. Scanning electron microscope studies of the egg shell in some Anostraca (Crustacea: Branchiopoda). *Cell Tiss. Res.* 193: 337-351.
- Hill, R. E., and W. D. Shepard. 1998. Observation on the identification of California anostracan 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.



APPENDIX A. REPRESENTATIVE PHOTOGRAPHS

Soil Examinations
Lawrence Livermore National Laboratory
Site 300 Experimental Test Site

Ph: (916) 543-7397
Fax: (916)543-7398



Pool 2, December 10, 2009: Photo taken from east edge of pool looking west.



Dry Pool 1, August 21, 2008: Photo taken from southwest looking northeast.