UC Merced/University Community Planning Area Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey Report

Prepared for
University of California
and Merced County

EIP

September 1999

UC Merced/University Community Planning Area
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1998/1999 Wet Season Survey Report

Prepared for:

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Prepared by:

EIP Associates
Sacramento, California

September 1999

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FEDERALLY-LISTED VERNAL POOL CRUSTACEANS SURVEY REPORT FOR THE UC MERCED/UNIVERSITY COMMUNITY PLANNING AREA IN EASTERN MERCED COUNTY, CALIFORNIA

INTRODUCTION

EIP Associates, on behalf of the University of California and Merced County, initiated informal consultation with the U.S. Fish and Wildlife Service (Service) during December 1998. The consultation was initiated to determine whether the long term development of the 10th campus of the University of California (i.e., UC Merced) and adjacent University Community could affect federally-listed species and therefore require compliance with the Endangered Species Act. Studies conducted in support of the preliminary Section 404 assessment and analysis of constraints related to waters of the United States on the UC Merced campus site (Stromberg, 1998) and biological assessment for the Revised Bear Creek Unit of the Merced County Streams Project (Jones and Stokes, 1997) had already identified the vernal pool fairy shrimp (*Branchinecta lynchi*) within the UC Merced/University Community planning area (planning area). This species was listed as threatened on September 19, 1994 (59 Federal Register 48136). The Service subsequently determined during informal consultation that additional information on the presence and distribution of federally-listed vernal pool branchiopods within the planning area would be required as part of the consultation process. The Service was particularly concerned about the potential for the Conservancy fairy shrimp (*Branchinecta conservatio*) to occur within the planning area given the areas' extensive vernal pool resources and that known occurrences for this extremely rare species have been documented from approximately 0.5 miles east (near Haystack Mountain) and 17 miles southwest (at San Luis National Wildlife Refuge) of the planning area.

Further informal consultation with the Service (Exhibit 1) resulted in the preparation of a survey protocol designed to provide presence and distribution data for federally-listed vernal pool branchiopods that occur within the planning area. The Service provided verbal concurrence with this protocol on January 20 and 22, 1999 and written concurrence on March 24, 1999 (Exhibit 2). The protocol was subsequently implemented during the 1998/1999 wet season. The following report describes the survey methodology that was implemented, presents the results of the survey, and identifies recovery recommendations as required by EIP Associates' Federal Scientific Take Permit No. TE795938-2 (Exhibit 3).

METHODS

The following survey protocol was designed to identify the presence and distribution of vernal pool branchiopods (particularly *B. conservatio*) within the UC Merced/University Community planning area (study area). The survey protocol follows the Service's April 19, 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 where possible, but includes a number of variances that reflect the primary purpose of the surveys (i.e., documentation of *B. conservatio* within the study area), logistical constraints associated with the study area, and 1998/1999 wet season weather conditions. The variances from the standard protocol were agreed upon during a meeting between EIP Associates and the Service on January 6, 1999, and subsequent phone discussions. These variances are summarized in Table 1.

The survey protocol consisted of a representative sampling program that provided coverage of each of 29 watershed subbasins within the study area (Figure 1). No sampling was conducted in watershed subbasins MC01, FC07, FC09, BR04, BR07, BR08, BR09, BR11, LG10, LG11, LG12, LG13, LG14 (in part), and LG15 (in part) because the subbasins were either within the proposed Haystack Mountain Dam inundation area, largely outside of the study area, or did not contain vernal pools. In addition, since representative sampling was to be used, the Service determined that the survey results would have to comply with rather stringent probability constraints. Guidance from the Sacramento Fish and Wildlife Office of the Service indicated that the protocol would need to have less than a one percent probability of failing to find *B. conservatio* if it occurs within the study area. Consequently, the equation $(1-a)^x=b$ was used to determine the minimum number of vernal pools that would need to be surveyed to achieve this confidence level. The variables in this equation correspond to the following:

- "a" is the percentage of vernal pools in the Central Valley that *B. conservatio* has been assumed to be randomly distributed in;
- "b" is the probability of failing to find the species if it occurs within the study area; and
- "x" is the number of vernal pools that would need to be sampled to achieve the probability associated with "b."

Using the assumptions that *B. conservatio* is randomly distributed in one percent of the vernal pools within the study area and the surveys would have less than a one percent chance of failing to find the species if it occurs on-site, it was determined that a minimum of 458 vernal pools would need to be sampled. These 458 pools were originally intended to be located within the areas that would most likely experience development associated with the campus and adjacent University Community. However, the University and County decided that a similar level of effort throughout the planning area would provide data that would be useful for mitigation planning as well as impact analysis. The minimum number of vernal pools that would be sampled was therefore increased to 680 pools distributed throughout the planning area.

A total of 713 vernal pools within the study area were ultimately sampled. A total of 709 vernal pools were sampled during sampling period 1 (February 4 to 17, 1999). However, six of these vernal pools (i.e., pools 3, 4, 5, 6, 8 and 11 in subbasin LG03) were deleted from further study because three of the pools were geo-referenced into the data base twice (i.e., were duplicates) and three pools could not be relocated with the Trimble Pro XRS Global Positioning System (GPS) units. In addition, 10 new vernal pools (i.e., pools 27, 28, 29 and 30 in subbasin LG06, pools 27, 28, 29, 30 and 31 in subbasin LG02, and pool 19 in LG05) were added to the study during sampling period 2 (February 18 to March 3, 1999). These latter vernal pools were added to provide better geographic coverage within portions of the study area that appeared to be inadequately represented. The number of vernal pools sampled per subbasin ranged between 3

TABLE 1

VARIANCES FROM APRIL 19, 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

Variance	Justification
Surveys were conducted for a total of ten (10) weeks rather than during the entire period of inundation and were initiated during early February.	The late 1998/1999 wet season precluded sampling earlier than February. In addition, the 10-week survey protocol was based on previous studies which indicated that the study area's vernal pools are rarely inundated for more than about 70 days. It was also expected that water temperatures that are lethal for vernal pool branchiopods (>24°C) would become prevalent by early to mid-April.
The 10-week survey consisted of five (5) consecutive 2-week sampling periods.	The use of consecutive 2-week sampling periods was based on the minimum time required for *B. conservatio* to hatch and reach maturity under optimum conditions (approximately 19 days at 20°C) (Helm 1998). The 2-week sampling frequency should therefore not fail to find identifiable *B. conservatio* if they hatched and developed to maturity in a sampled vernal pool.
Representative sampling of the vernal pools within the study area was conducted rather than sampling of all vernal pools. Consequently, a minimum of 458 vernal pools were proposed for sampling.	The estimated number of vernal pools within the study area (approximately 7,000) precluded sampling of all pools within the area. The minimum number of vernal pools sampled was based on the assumption that *B. conservatio* is randomly distributed in approximately 1% of vernal pools and the requirement to achieve less than a 1% probability of failing to find the species if it occurs within the study area.
Representative sampling of the vernal pools within each watershed subbasin was conducted rather than sampling of all vernal pools within the study area.	The number of vernal pools within the study area precluded sampling of all pools within the area. Therefore, a representative sample of the type, size and distribution of vernal pools within each watershed subbasin was conducted.
Sampling of each vernal pool was continued through the entire 10-week survey regardless of whether a federally-listed vernal pool branchiopod (other than *B. conservatio)* was found as opposed to terminating sampling as soon as a listed species was found.	Sampling was continued in each surveyed vernal pool if a federally-list vernal pool branchiopod (other than *B. conservatio)* was found since the primary purpose of the surveys was to document the presence of *B. conservatio*.

Source: EIP Associates, 1999.

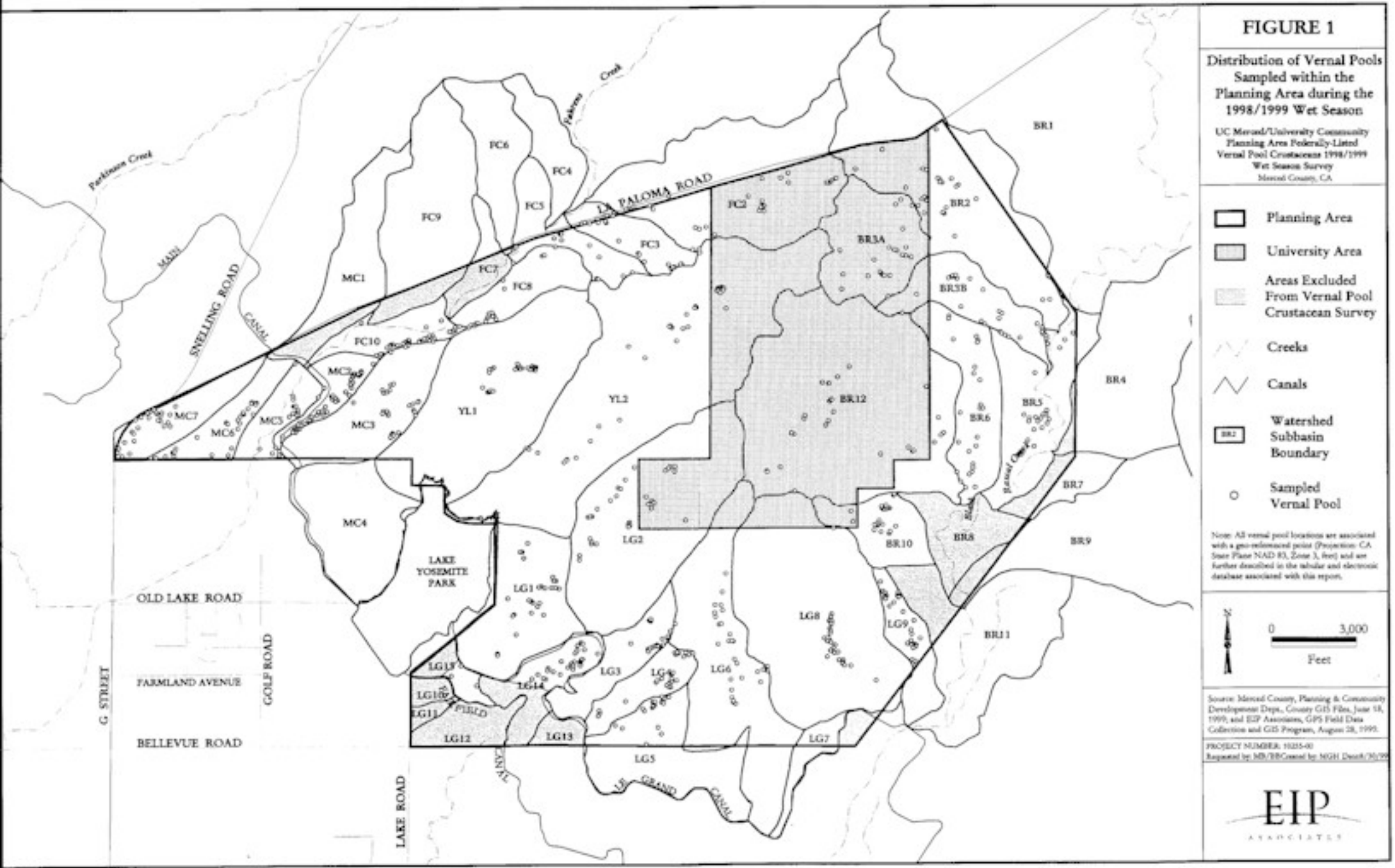

FIGURE 1

Distribution of Vernal Pools Sampled within the Planning Area during the 1998/1999 Wet Season

UC Merced/University Community Planning Area Federally-Listed Vernal Pool Crustacean 1998/1999 Wet Season Survey
Merced County, CA

- Planning Area
- University Area
- Areas Excluded From Vernal Pool Crustacean Survey
- Creeks
- Canals
- BR2 — Watershed Subbasin Boundary
- Sampled Vernal Pool

Note: All vernal pool locations are associated with a geo-referenced point (Projection: CA State Plane NAD 83, Zone 3, feet) and are further described in the tabular and electronic database associated with this report.

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Source: Merced County, Planning & Community Development Dept., County GIS Files, June 18, 1999; and EIP Associates, GPS Field Data Collection and GIS Program, August 28, 1999.

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Requested by: MB/BB Created by: MGH Date: 8/30/99

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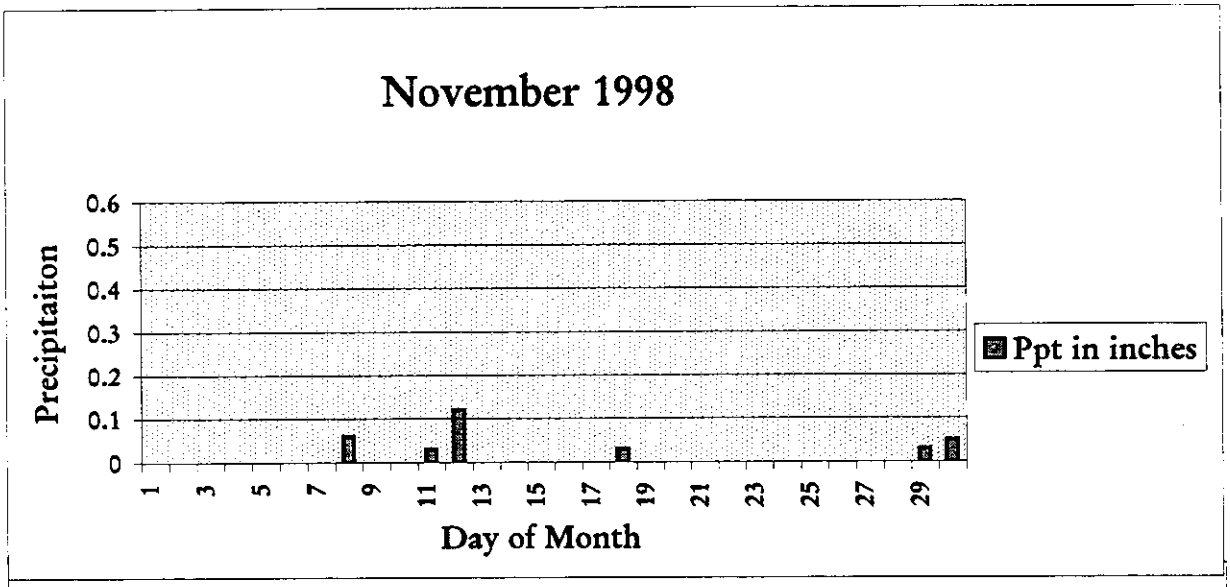
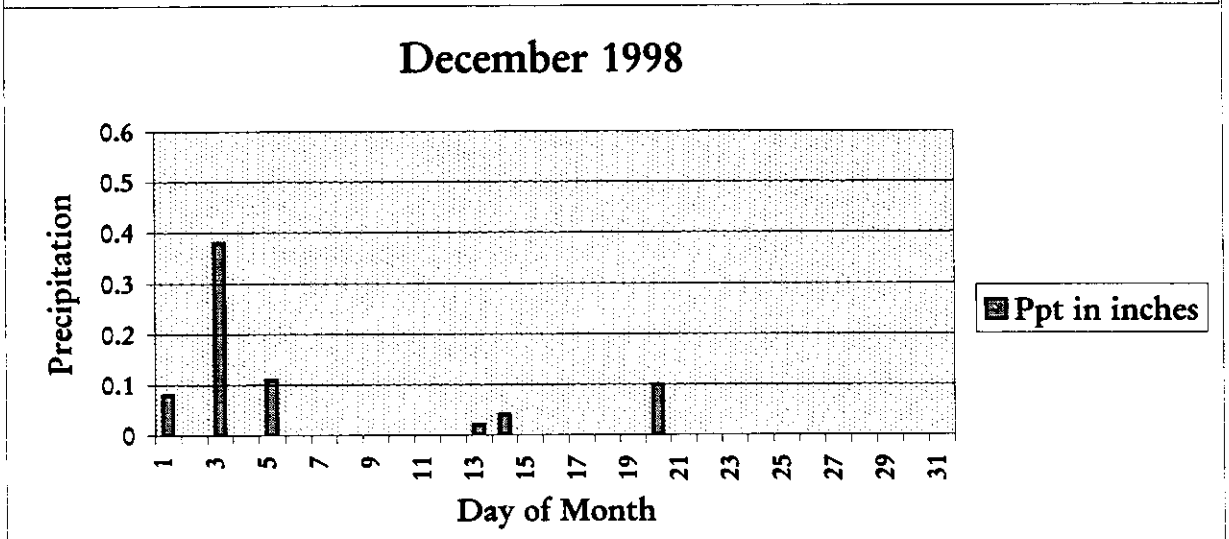
and 39 ($\bar{x}$=24 pools). The range of the number of vernal pools sampled per individual subbasin was based on the number of inundated vernal pools present in a subbasin (e.g., only three vernal pools in LG15), difficulties in determining which subbasin some vernal pools were located in due to the relatively flat topography, and attempts to provide more complete geographic coverage within portions of the study area. It should be noted that at least 26 vernal pools were sampled in each subbasin that contained as many as 26 pools.

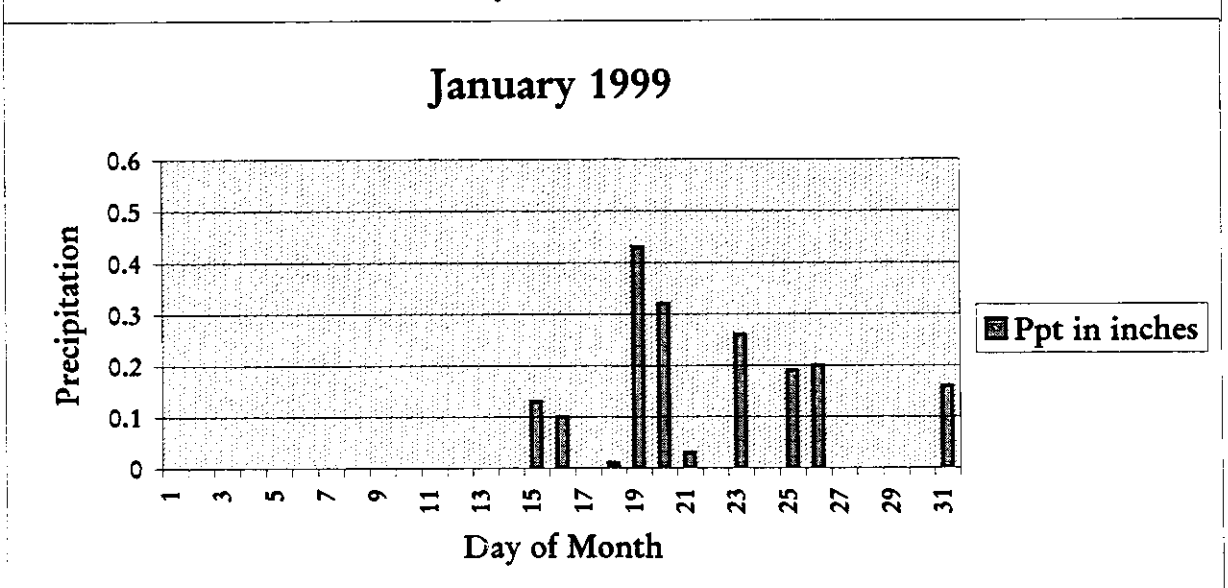
The surveys were proposed to be initiated during the wet season of 1998/1999 within two weeks of the vernal pools filling and holding at least 2.5 cm of standing water at least 12 hours after a rain event. Monitoring of the study area indicated that these conditions first occurred on approximately January 22, 1999. However, only a small number of pools were inundated to a depth of 2.5 cm at this time. Substantial numbers of pools did not fill until approximately February 1, 1999. The first 2-week sampling period was therefore initiated on February 4, 1999. Precipitation data for the vicinity of the study area are shown in Figures 2A and 2B. Each surveyed vernal pool was then sampled once (if inundated) during each of the remaining four (4) consecutive 2-week sampling periods.

The surveys utilized a pool skimmer-type dipnet with a mesh size of no greater than 1/8 inch. The frequency of sampling points at any given vernal pool varied, but generally consisted of a sample point at least every five feet around the pool perimeter on pools less than 20 feet in diameter and at least every 12 feet on pools greater than 20 feet in diameter. Data collected from the surveyed vernal pools included the species of vernal pool crustaceans present, pool surface area, pool inundation depth, water temperature, air temperature, turbidity, estimated population size, and presence of vernal pool amphibians. These data were recorded on standard data sheets (i.e., USFWS Vernal Pool Data Sheet for Wet Season Surveys) (Exhibit 4). Data were also recorded in an electronic data dictionary that was geo-referenced to the location of each vernal pool through the use of a GPS unit. A hard-copy example of this data dictionary is provided in Exhibit 5.

Vernal pools were sampled regardless of whether vernal pool branchiopods were visible within the pool. No more than 20 individuals of either *Lepidurus packardi* or *Branchinecta* sp. or less than 10% of the subpopulation in the vernal pool (whichever was the lesser amount) were collected during each visit. Mature male *Branchinecta* sp. were preferentially collected whenever possible to help facilitate later identification efforts. However, female and immature specimens were also collected when necessary to document vernal pool branchiopod presence at each vernal pool. Captured vernal pool branchiopods were transferred from the dipnets into 4-dram glass shell vials. The vials were filled with water from the same vernal pool in which the specimens were collected. Each vial contained a label with the date, collector's initials, and vernal pool identification number. Collected specimens were taken to the field lab where they were transferred from the vernal pool water into a dish containing tonic water. The tonic water relaxed and asphyxiated the specimens prior to their transfer into alcohol. This latter step helped to achieve a better state of preservation since vernal pool branchiopods typically thrash and damage soft body parts when transferred live to alcohol. The specimens were removed from the tonic water and placed into labeled 4-dram glass shell vials containing 95% non-denatured alcohol. In order to achieve the initial fixation ratio recommended by the California Academy of Sciences







SOURCE: State of California, Department of Water Resources, 1999; EIP Associates, July 1999.

10255-0-2A/2B-Prcptn-Burns-Creek

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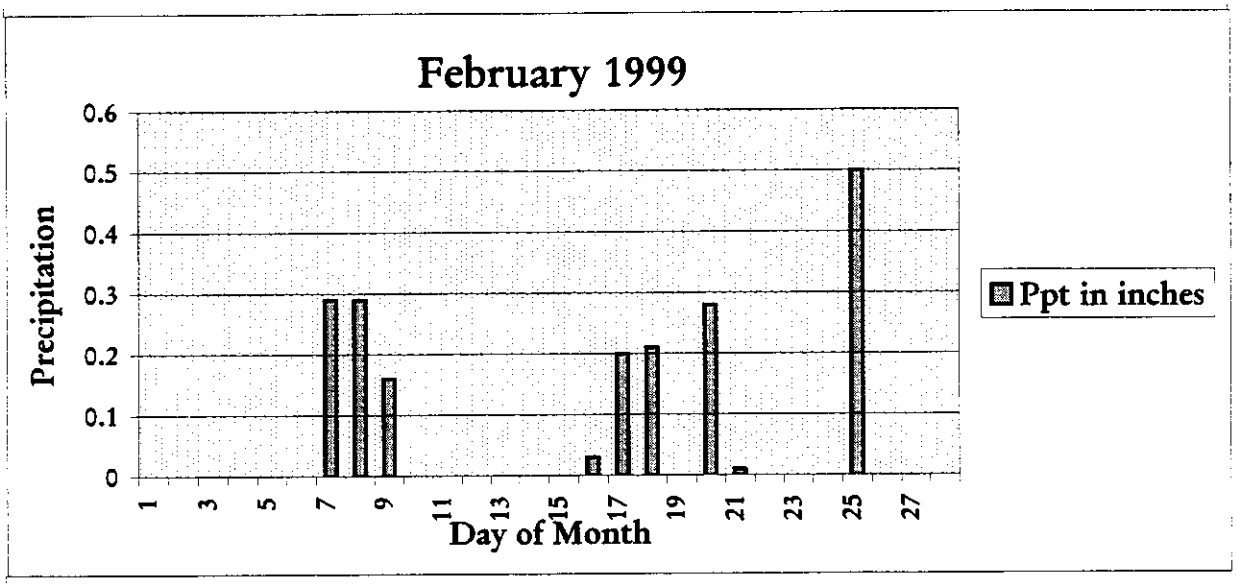
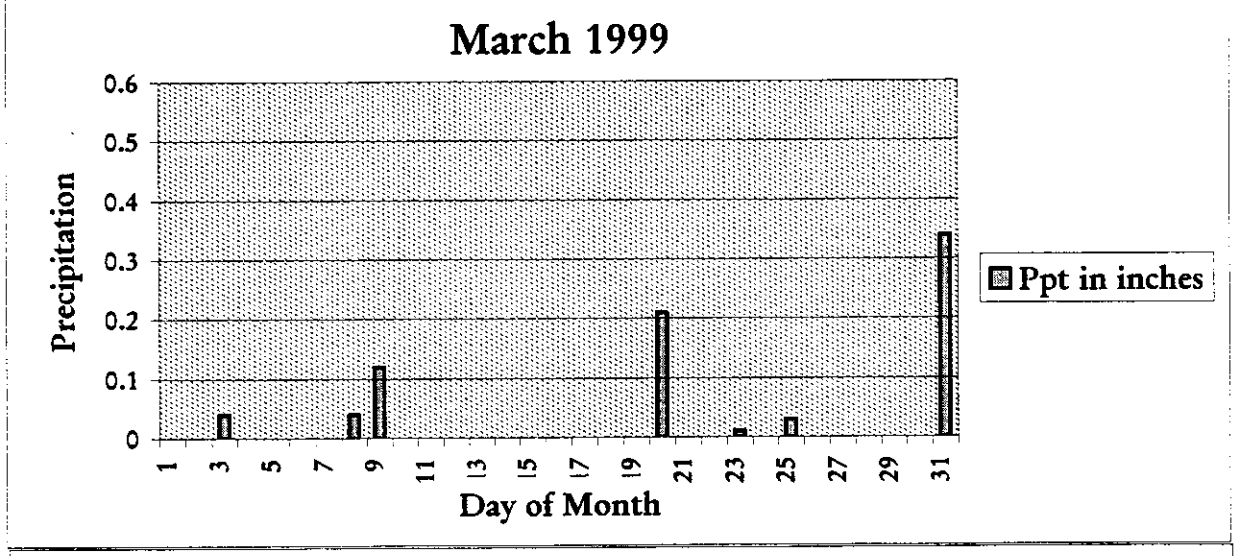
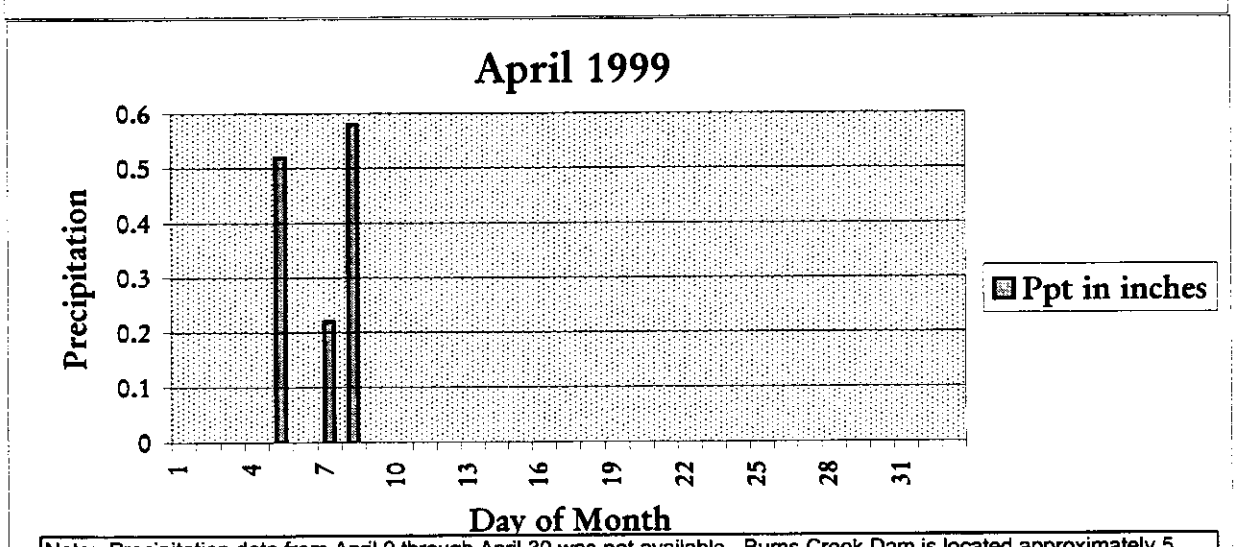
Figure 2A
Precipitation at Burns Creek Dam







Note: Precipitation data from April 9 through April 30 was not available. Burns Creek Dam is located approximately 5 miles east of the UC Merced/University Community Planning Area.

SOURCE: State of California, Department of Water Resources, 1999; EIP Associates, July 1999.

10255-0-2A/2B-Prcptn-Burns-Creek

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Figure 2B
Precipitation at Burns Creek Dam

(CAS) of 10 parts alcohol to 1 part tissue, no more than 10 individual specimens were placed into each vial. Preserved specimens were later identified to species using a dissecting microscope. Relevant collection and identification data were entered into a GIS database. Approximately 80 voucher specimens will be preserved according to CAS's October, 1995 *Protocols and Standards for Preservation and Archival of Vernal Pool Crustaceans* and accessioned to both the CAS and Los Angeles County Museum of Natural History. The University of California will then request that the remaining voucher specimens be accessioned to the museum collections at either the University of California at Davis or the University of California at Berkeley.

RESULTS

Analysis of the data base generated during the 1998/1999 wet season survey for federally-listed vernal pool branchiopods within the planning area (Exhibit 6) determined that two species of federally-listed vernal pool branchiopods occur within the study area. In addition, two other non-listed species of vernal pool branchiopods were found to occur in the planning area. A brief summary of the survey results for each of these species, including associated habitat parameters such as water temperature, pool inundation depth, pool surface area, and estimated population size, is provided below.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp (*Branchinecta lynchi*) was found to be widely distributed across the study area (Figure 3, Exhibit 7) and occurred in 68 percent of all vernal pools sampled (Table 2). The species occurred in all sampled watershed subbasins within the study area and exhibited a frequency of occurrence that ranged between 33 and 90 percent of the sampled vernal pools within each of the subbasins.

The 482 vernal pools that *B. lynchi* occurred in ranged from 10 to 7,200 sq. ft. in surface area ($\bar{x}$=707 sq. ft., n=636 visits) when the species was present (Figure 4). However, 90 percent of the pools that the species was found in had a surface area less than 1,300 sq. ft. The 482 pools also ranged between 0 and 20 inches ($\bar{x}$=6 inches, n=636 visits) in inundation depth during sampling visits when the species was present (Figure 5), while the water temperature in these pools varied between 0 and 25°C (Figure 6).

Population size for *B. lynchi* was estimated in each occupied vernal pool during sampling. The recorded population estimates are provided in Figure 7. With the exception of one pool that contained *B. lynchi* on March 23, 1999, the last collected *B. lynchi* from sampled vernal pools in the planning area were taken during March 11 and 12, 1999. The mean surface area, pool inundation depth, and water temperature for the 30 pools with *B. lynchi* on these dates were respectively 669 sq. ft., 4 inches, and 14°C. The last date on which one of the 482 vernal pools contained water at least one inch deep (i.e., 2.5 cm) was April 8, 1999. It should be noted that this latter pool (MC0516) contained water on March 12, 1999, but was dry on March 26, 1999. It subsequently refilled after this date, but contained no *B. lynchi* during subsequent surveys.

TABLE 2

Frequency of Occurrence of Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) within each Watershed Subbasin

Watershed Subbasin	Number of Vernal Pools Sampled within Watershed Subbasin	Vernal Pools with *Branchinecta lynchi*	Frequency of Occurrence
BR02	24	9	37.50%
BR03A	26	12	46.15%
BR03B	26	16	61.54%
BR05	22	14	63.64%
BR06	26	16	61.54%
BR10	22	17	77.27%
BR12	27	14	51.85%
FC02	26	16	61.54%
FC03	24	15	62.50%
FC05	12	10	83.33%
FC08	20	15	75.00%
FC10	34	30	88.24%
LG01	26	14	53.85%
LG02	31	22	70.97%
LG03	20	12	60.00%
LG04	26	21	80.77%
LG05	19	14	73.68%
LG06	30	20	66.67%
LG08	26	19	73.08%
LG09	26	20	76.92%
LG14	26	17	65.38%
LG15	3	1	33.33%
MC02	39	35	89.74%
MC03	26	19	73.08%
MC05	17	11	64.71%
MC06	26	18	69.23%
MC07	26	16	61.54%
YL01	26	22	84.62%
YL02	31	17	54.84%
TOTAL	**713**	**482**	**67.60%**

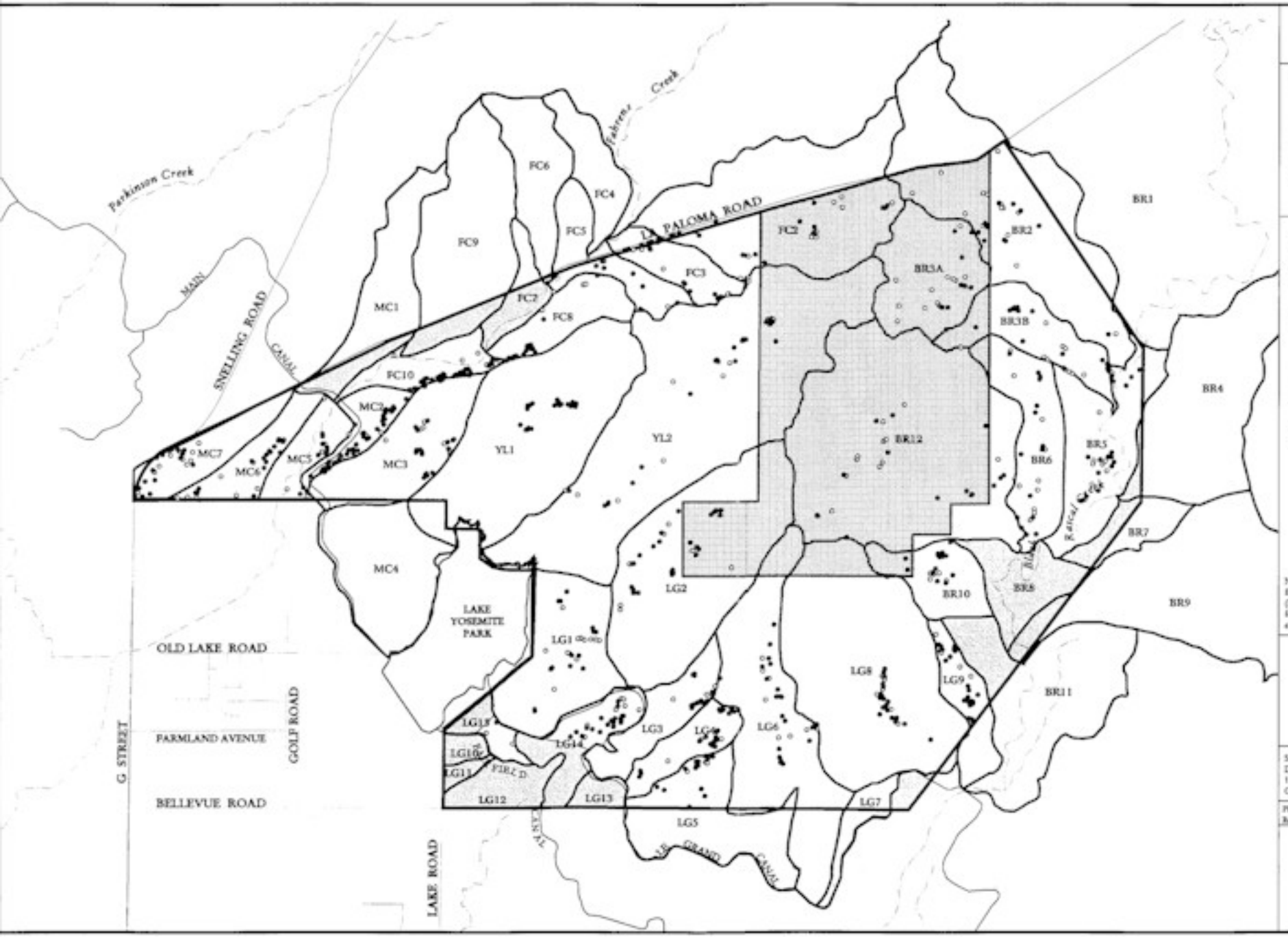

FIGURE 3

Occurrences of Vernal Pool Fairy Shrimp *(Branchinecta lynchi)* within the Planning Area

UC Merced/University Community Planning Area Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey
Merced County, CA

- Planning Area
- University Area
- Areas Excluded From Vernal Pool Crustacean Survey
- Creeks
- Canals
- Watershed Subbasin Boundary (BR2)
- Sampled Vernal Pools with *Branchinecta lynchi*
- Other Sampled Vernal Pools

Note: All occurrences of species shown in this figure are associated with a geo-referenced point (Projection: CA State Plane, NAD 83, Zone 3, feet) and are further described in the tabular and electronic database associated with this report.

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Source: Merced County, Planning & Community Development Dept., County GIS Files, June 18, 1999; and EIP Associates, GPS Field Data Collection and GIS Program, August 28, 1999.

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Requested by: MB/BB Created by: MGH Date:8/30/99

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Figure 4
Presence of Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) vs. Vernal Pool Surface Area

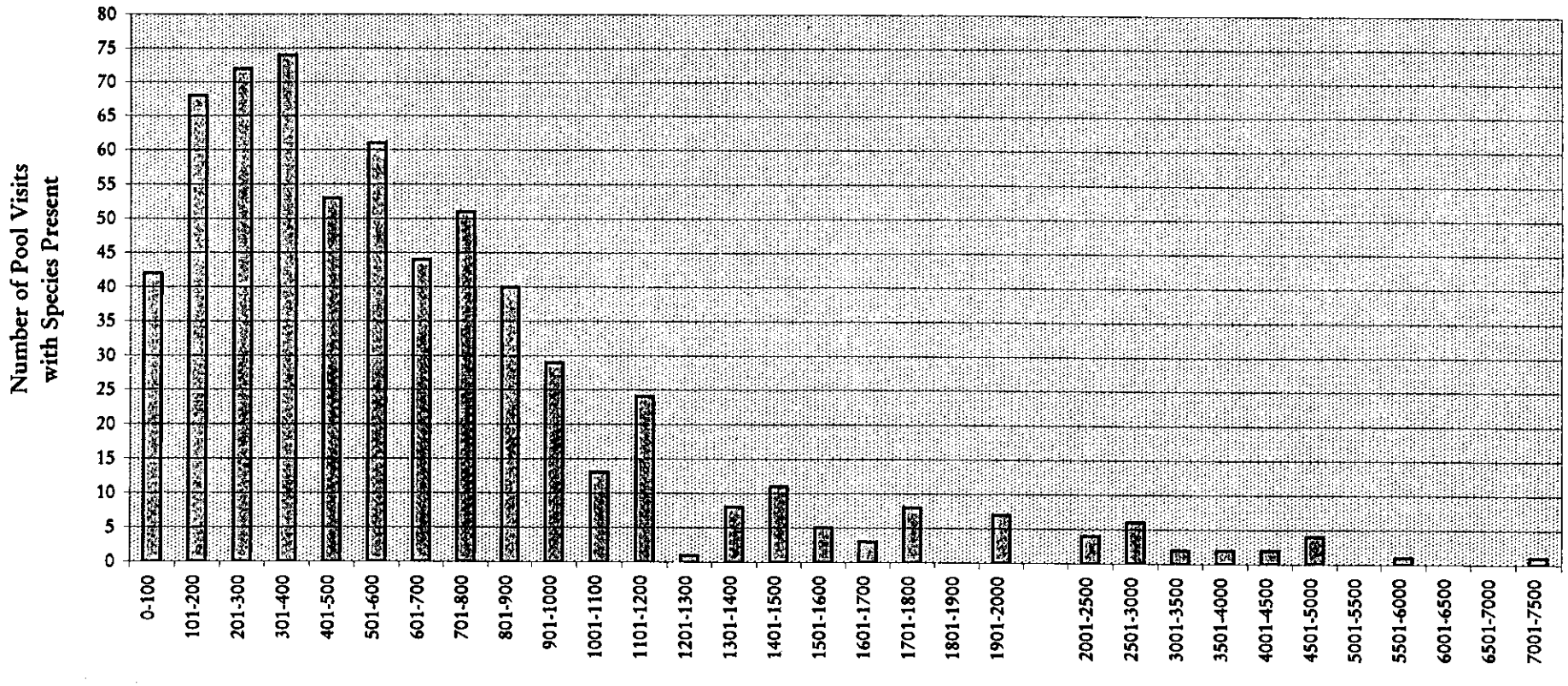


Figure 5
Presence of Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) vs. Inundation Depth

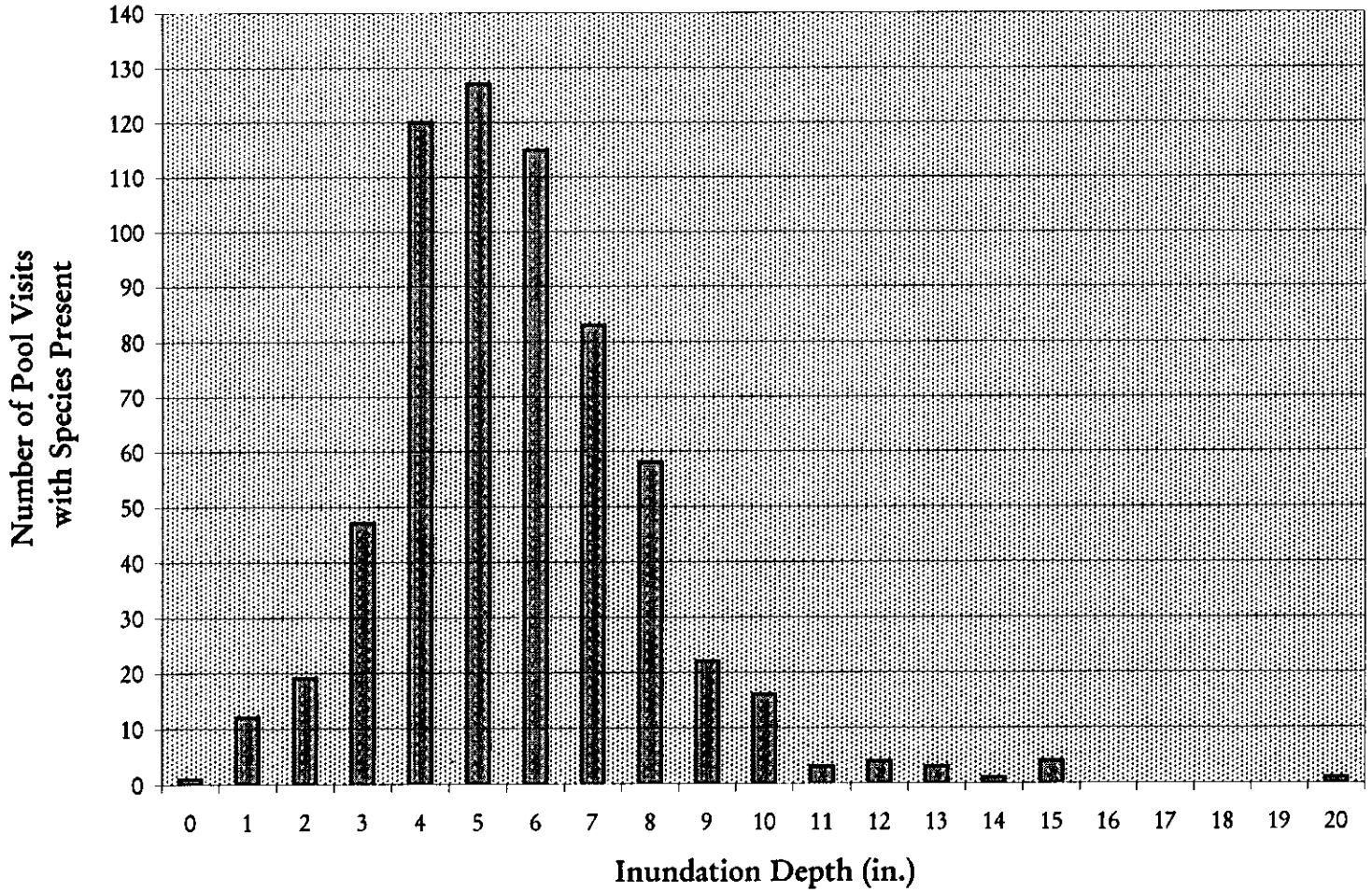


Figure 6
Presence of Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) vs. Water Temperature

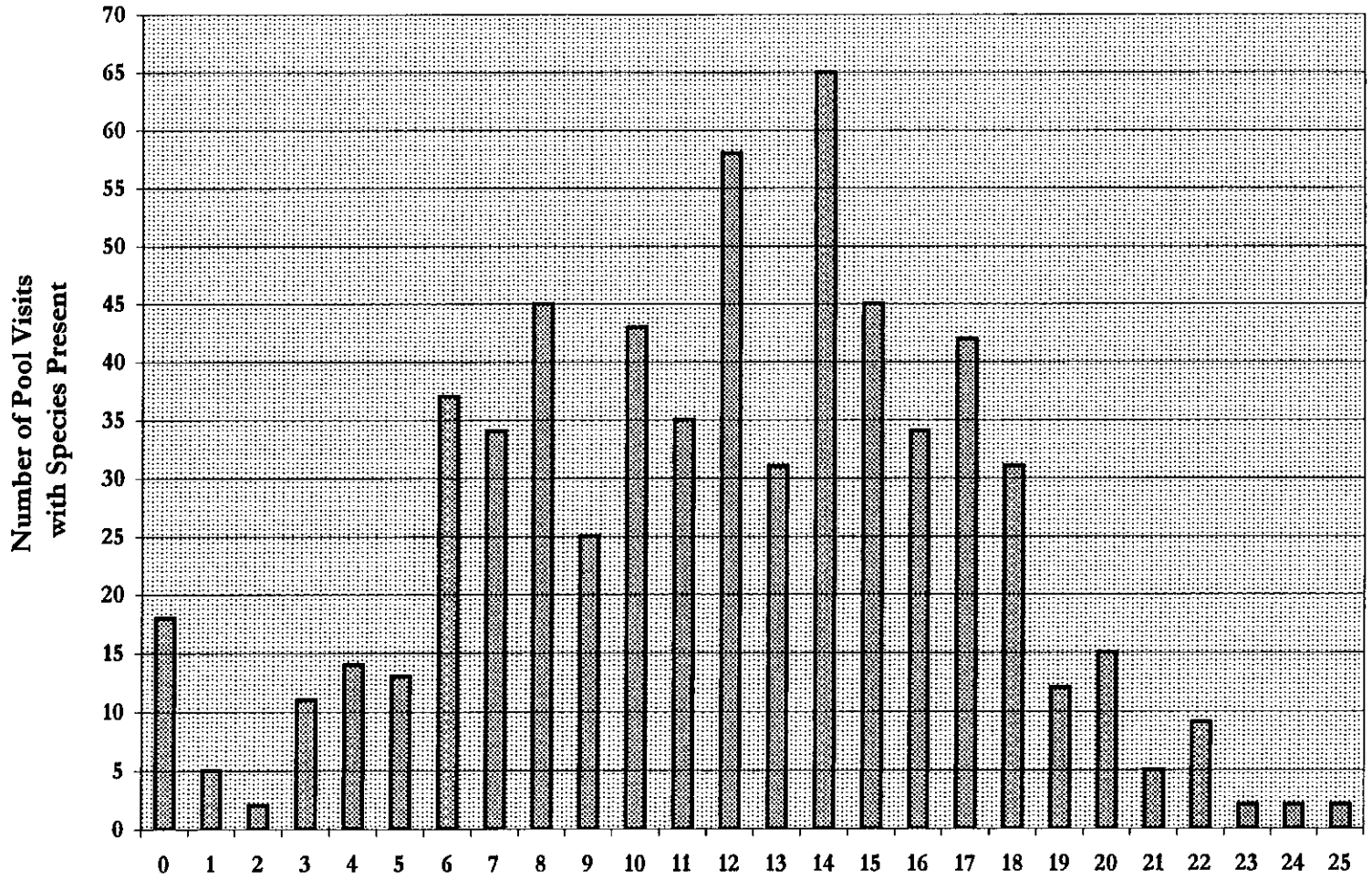
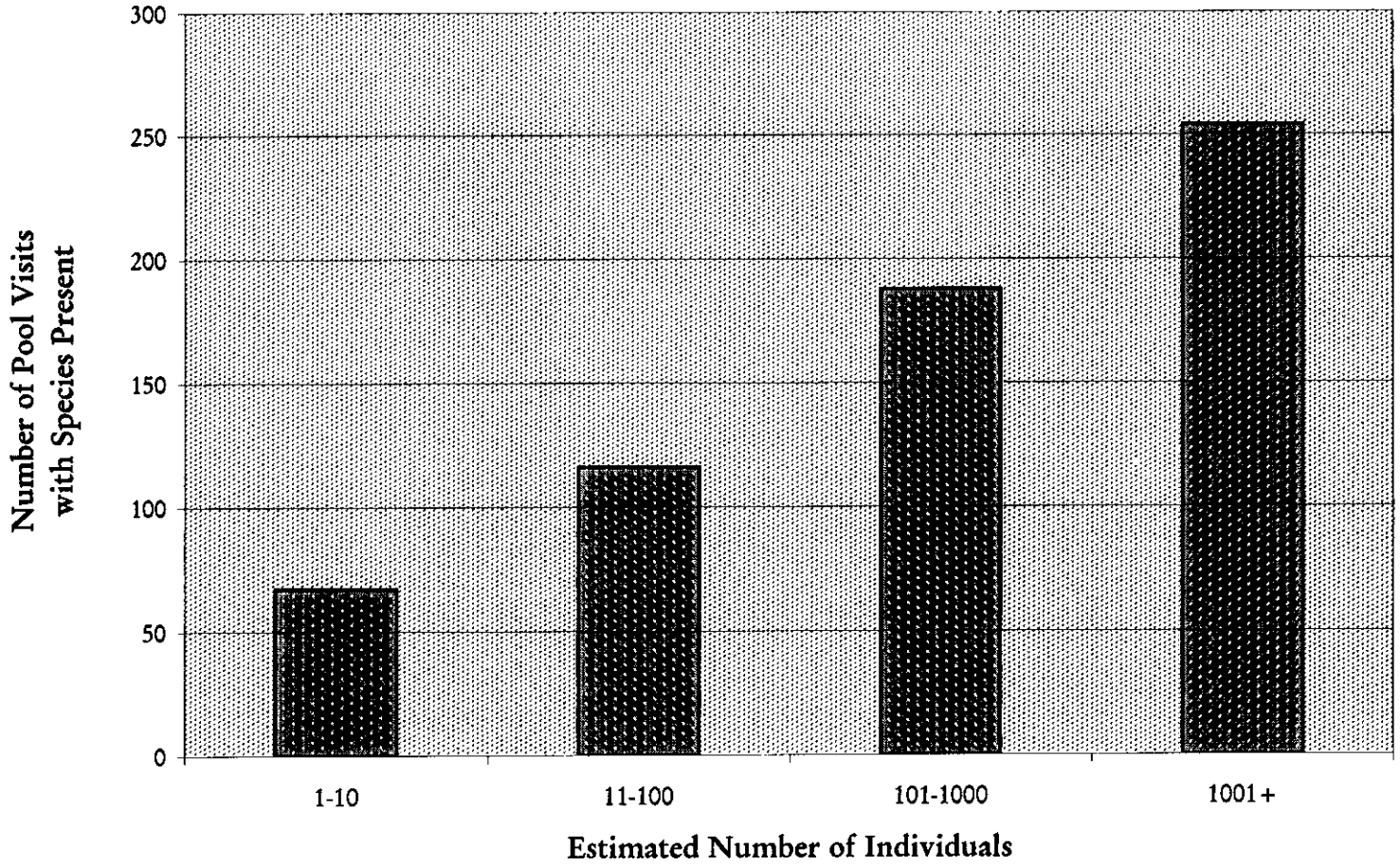


Figure 7
Estimated Population Size of Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) During Vernal Pool Visits



Vernal Pool Tadpole Shrimp

The second federally-listed vernal pool branchiopod that was documented from the study area was the vernal pool tadpole shrimp (*Lepidurus packardi*). This species was found only in three vernal pools located within watershed subbasin LG09 (Table 3, Figure 8, Exhibit 8),where it co-occurred with *B. lynchi* (Table 4). The co-occurrence of these two species is not unusual given that *L. packardi* is known to prey on *Branchinecta* sp. (Eriksen and Belk, 1999).

The three vernal pools that *L. packardi* occurred in ranged from 480 to 1,000 sq. ft. in surface area ($\bar{x}$=686 sq. ft., n=5 visits) when the species was present (Figure 9). The inundation depth of these pools during sampling visits when the species was present ranged between 5 and 8 inches ($\bar{x}$=6 inches, n=5 visits) (Figure 10), while the water temperature in these pools varied between 15 and 18°C (Figure 11). The estimated population size of this species during the five sampling visits when the species was present is provided in Figure 12. The last collected *L. packardi* from sampled vernal pools in the planning area were taken on February 25, 1999. The last sample date on which one of the three pools contained water at least one inch deep (i.e., 2.5 cm) was February 25, 1999.

Midvalley Fairy Shrimp

A third vernal pool branchiopod that was documented from the study area is a currently undescribed species of *Branchinecta* that may be formally described as the species *Branchinecta mesovaliensis* before the end of 1999. This species, known as the midvalley fairy shrimp, was more widely distributed than *L. packardi*, but was still substantially less common than *B. lynchi*. The species was documented from 54 vernal pools (8 percent of the sampled vernal pools within the study area) distributed irregularly within a broad band that stretches from the watershed subbasins associated with the Main Canal and Fahrens Creek in the northwestern portion of the study area to the subbasins in the southern portion of the study area that are located north of Le Grand Canal (Table 5, Figure 13, Exhibit 9). Within the watershed subbasins that the species occurred in it exhibited a frequency of occurrence that ranged between 3 and 60 percent of the sampled vernal pools. It should be noted that this species occurred in conjunction with *B. lynchi* in 31 pools (57 percent of the pools that midvalley fairy shrimp was found in) (Table 4). It was not found in the same vernal pools as *L. packardi*.

The surface area of the 54 vernal pools that the midvalley fairy shrimp was documented in ranged from 25 to 4,000 sq. ft. ($\bar{x}$=386 sq. ft., n= 57 visits) when the species was present (Figure 14). Ninety-five percent of these pools were less than 750 sq. ft. in surface area. The inundation depth of these pools ranged between 1 and 8 inches ($\bar{x}$=5 inches, n= 57 visits) during sampling visits when the species was present (Figure 15). Water temperatures in these occupied pools varied between 0 and 25°C (Figure 16).

The estimated population size for the midvalley fairy shrimp during each sampling visit of an occupied vernal pool is provided in Figure 17. The last collected midvalley fairy shrimp from sampled vernal pools in the planning area were taken between March 1 and 3, 1999. The mean surface area, pool inundation depth, and water temperature for the 15 pools with midvalley fairy

TABLE 3

Frequency of Occurrence of Vernal Pool Tadpole Shrimp (*Lepidurus packardi*) within each Watershed Subbasin

Watershed Subbasin	Number of Vernal Pools Sampled within Watershed Subbasin	Vernal Pools with *Lepidurus packardi*	Frequency of Occurrence
BR02	24	0	0.00%
BR03A	26	0	0.00%
BR03B	26	0	0.00%
BR05	22	0	0.00%
BR06	26	0	0.00%
BR10	22	0	0.00%
BR12	27	0	0.00%
FC02	26	0	0.00%
FC03	24	0	0.00%
FC05	12	0	0.00%
FC08	20	0	0.00%
FC10	34	0	0.00%
LG01	26	0	0.00%
LG02	31	0	0.00%
LG03	20	0	0.00%
LG04	26	0	0.00%
LG05	19	0	0.00%
LG06	30	0	0.00%
LG08	26	0	0.00%
LG09	26	3	11.54%
LG14	26	0	0.00%
LG15	3	0	0.00%
MC02	39	0	0.00%
MC03	26	0	0.00%
MC05	17	0	0.00%
MC06	26	0	0.00%
MC07	26	0	0.00%
YL01	26	0	0.00%
YL02	31	0	0.00%
TOTAL	713	3	0.42%

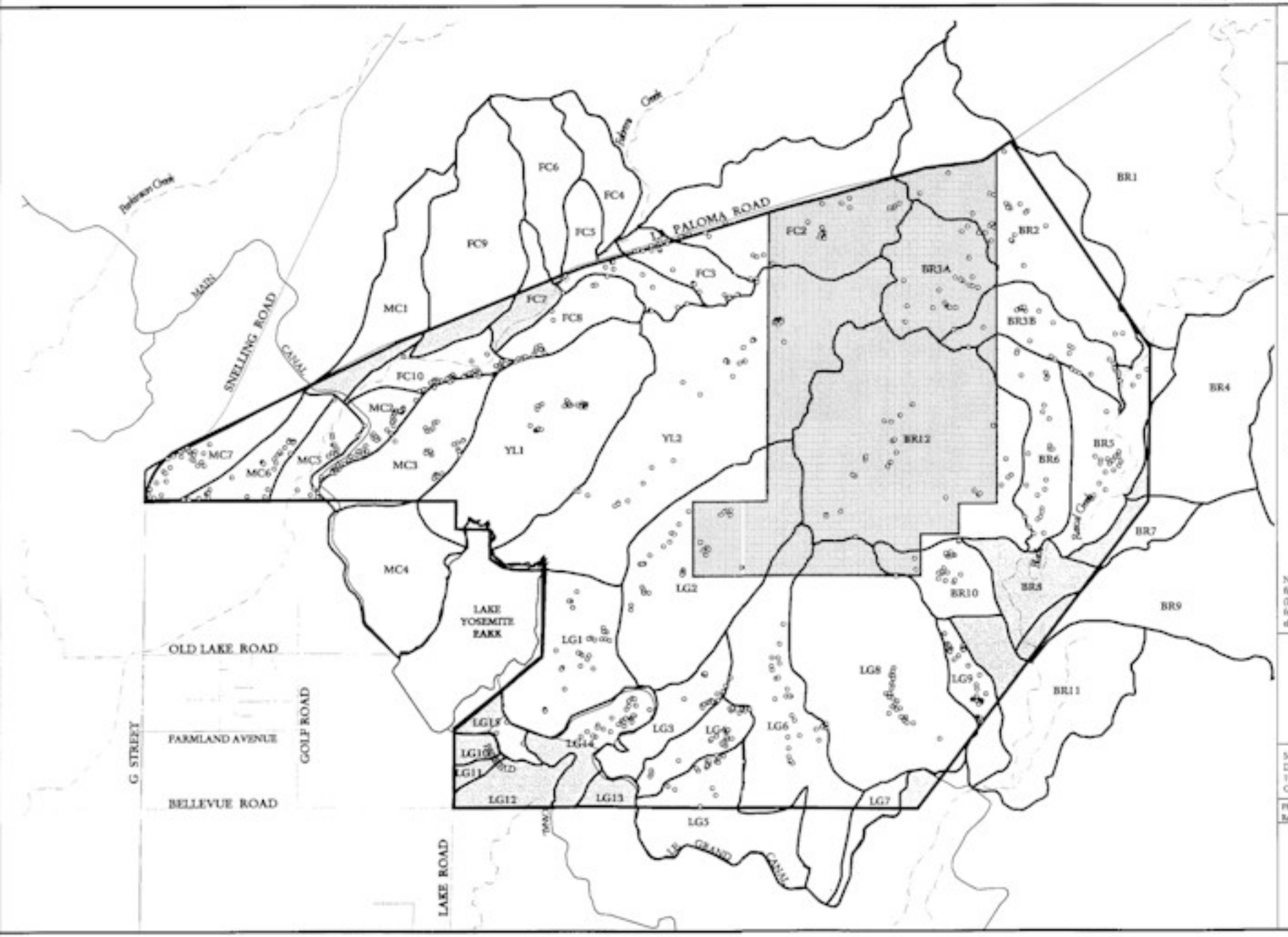


FIGURE 8

Occurrences of Vernal Pool Tadpole Shrimp *(Lepidurus packardi)* within the Planning Area

UC Merced/University Community Planning Area Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey
Merced County, CA

- Planning Area
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- Watershed Subbasin Boundary (BR2)
- Sampled Vernal Pools with *Lepidurus packardi*
- Other Sampled Vernal Pools

Note: All occurrences of species shown in this figure are associated with a geo-referenced point (Projection: CA State Plane, NAD 83, Zone 3, feet) and are further described in the tabular and electronic database associated with this report.

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0 3,000
Feet

Source: Merced County, Planning & Community Development Dept., County GIS Files, June 18, 1999; and EIP Associates, GPS Field Data Collection and GIS Program, August 28, 1999.

PROJECT NUMBER: 10253.00
Reviewed by: MB/BB/Created by: MGH Date:8/30/99

EIP ASSOCIATES

TABLE 4

Sampled Vernal Pools Containing Multiple Species of Special Status Vernal Pool Branchiopods

Watershed Subbasin	Vernal Pool ID	Species Present
BR02	BR0206	Vernal Pool Fairy Shrimp California Fairy Shrimp
BR03B	BR03B19	Vernal Pool Fairy Shrimp California Fairy Shrimp
BR10	BR1004	Vernal Pool Fairy Shrimp California Fairy Shrimp
BR10	BR1016	Vernal Pool Fairy Shrimp California Fairy Shrimp
BR10	BR1022	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
FC03	FC0321	Vernal Pool Fairy Shrimp California Fairy Shrimp
FC03	FC0322	Vernal Pool Fairy Shrimp California Fairy Shrimp
FC03	FC0323	Vernal Pool Fairy Shrimp California Fairy Shrimp
FC05	FC0511	Vernal Pool Fairy Shrimp California Fairy Shrimp
FC10	FC1002	Vernal Pool Fairy Shrimp California Fairy Shrimp
FC10	FC1009	Vernal Pool Fairy Shrimp California Fairy Shrimp
FC10	FC1013	Vernal Pool Fairy Shrimp California Fairy Shrimp
FC10	FC1013	Vernal Pool Fairy Shrimp California Fairy Shrimp
FC10	FC1034	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG01	LG0113	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG01	LG0124	Vernal Pool Fairy Shrimp California Fairy Shrimp
LG02	LG0202	Vernal Pool Fairy Shrimp California Fairy Shrimp
LG02	LG0210	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG02	LG0211	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG03	LG0301	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG03	LG0309	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp

TABLE 4

Sampled Vernal Pools Containing Multiple Species of Special Status Vernal Pool Branchiopods

Watershed Subbasin	Vernal Pool ID	Species Present
LG03	LG0312	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG03	LG0313	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG03	LG0315	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG03	LG0324	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG04	LG0412	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG04	LG0413	Vernal Pool Fairy Shrimp California Fairy Shrimp
LG05	LG0509	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG05	LG0516	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG05	LG0517	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG05	LG0519	Vernal Pool Fairy Shrimp California Fairy Shrimp
LG06	LG0620	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG06	LG0626	Vernal Pool Fairy Shrimp California Fairy Shrimp
LG06	LG0628	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp California Fairy Shrimp
LG06	LG0629	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG06	LG0630	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp California Fairy Shrimp
LG09	LG0902	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG09	LG0907	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
LG09	LG0911	Vernal Pool Fairy Shrimp Vernal Pool Tadpole Shrimp
LG09	LG0916	Vernal Pool Fairy Shrimp Vernal Pool Tadpole Shrimp
LG09	LG0921	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp

TABLE 4

Sampled Vernal Pools Containing Multiple Species of Special Status Vernal Pool Branchiopods

Watershed Subbasin	Vernal Pool ID	Species Present
LG09	LG0926	Vernal Pool Fairy Shrimp Vernal Pool Tadpole Shrimp
MC02	MC0203	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC02	MC0211	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC02	MC0222	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
MC02	MC0225	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC02	MC0227	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC02	MC0237	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
MC02	MC0239	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
MC03	MC0302	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
MC03	MC0303	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
MC03	MC0307	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
MC03	MC0324	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC05	MC0508	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC05	MC0513	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC06	MC0601	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC06	MC0605	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC06	MC0606	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC06	MC0612	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC06	MC0612	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC06	MC0616	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC06	MC0617	Vernal Pool Fairy Shrimp California Fairy Shrimp

TABLE 4

Sampled Vernal Pools Containing Multiple Species of Special Status Vernal Pool Branchiopods

Watershed Subbasin	Vernal Pool ID	Species Present
MC06	MC0618	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC06	MC0626	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC07	MC0703	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
MC07	MC0707	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC07	MC0708	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC07	MC0709	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC07	MC0714	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC07	MC0715	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
MC07	MC0717	Vernal Pool Fairy Shrimp California Fairy Shrimp
MC07	MC0718	Vernal Pool Fairy Shrimp California Fairy Shrimp
YL01	YL0103	Vernal Pool Fairy Shrimp Midvalley Fairy Shrimp
YL01	YL0105	Vernal Pool Fairy Shrimp California Fairy Shrimp

Figure 9
Presence of Vernal Pool Tadpole Shrimp (*Lepidurus packardi*) vs. Vernal Pool Surface Area

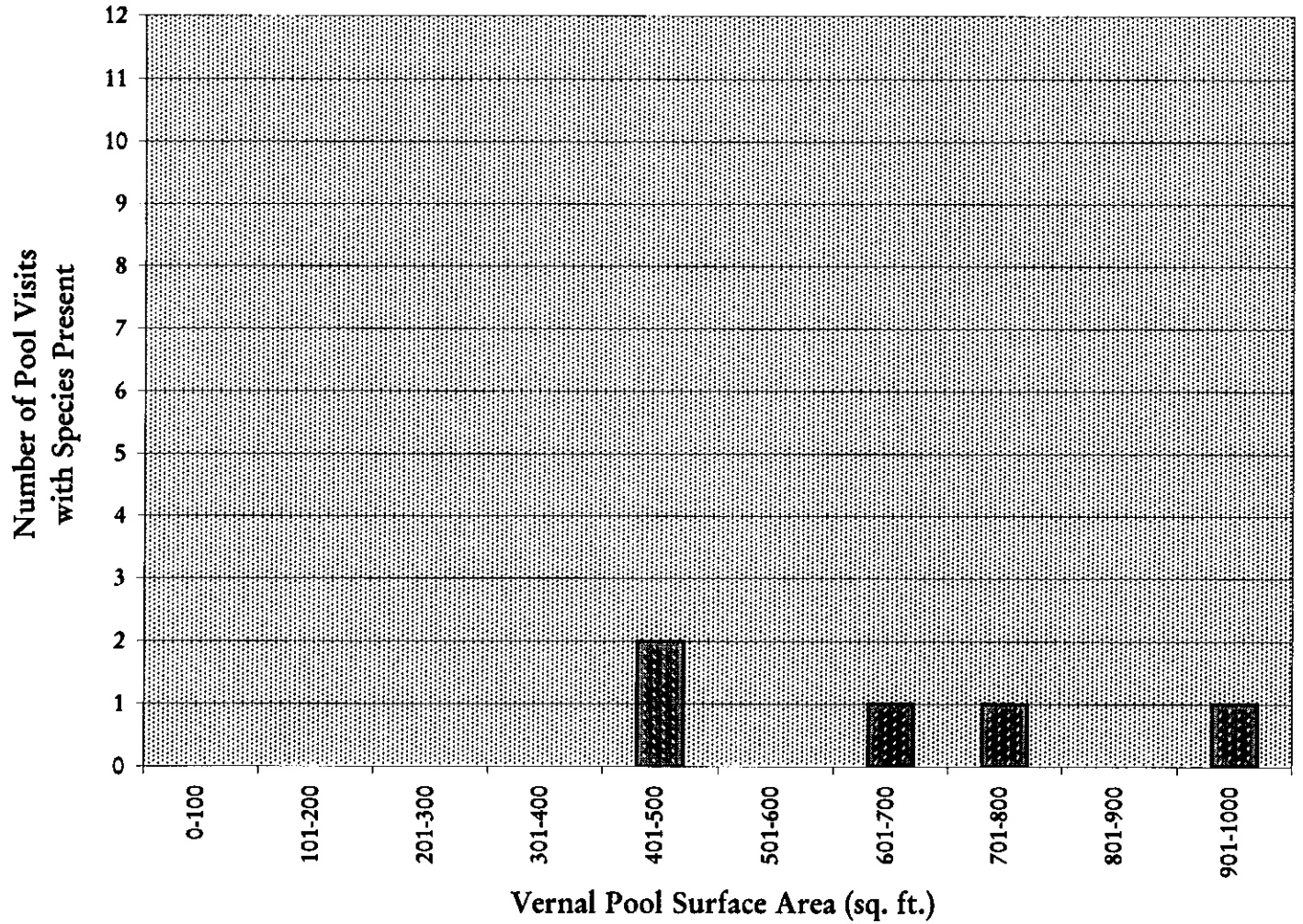


Figure 10
Presence of Vernal Pool Tadpole Shrimp (*Lepidurus packardi*) vs. Inundation Depth

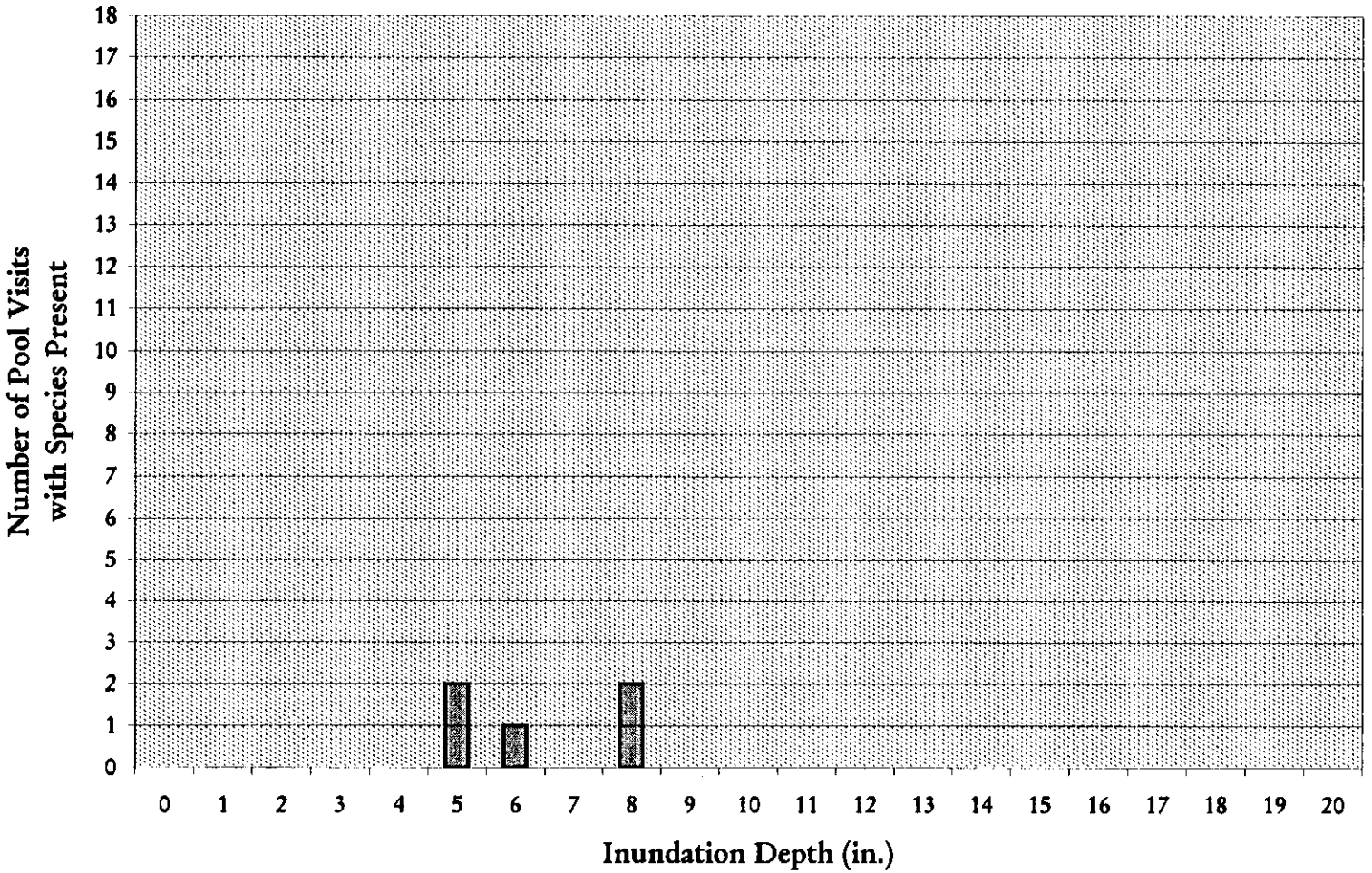


Figure 11
Presence of Vernal Pool Tadpole Shrimp (*Lepidurus packardi*) vs. Water Temperature

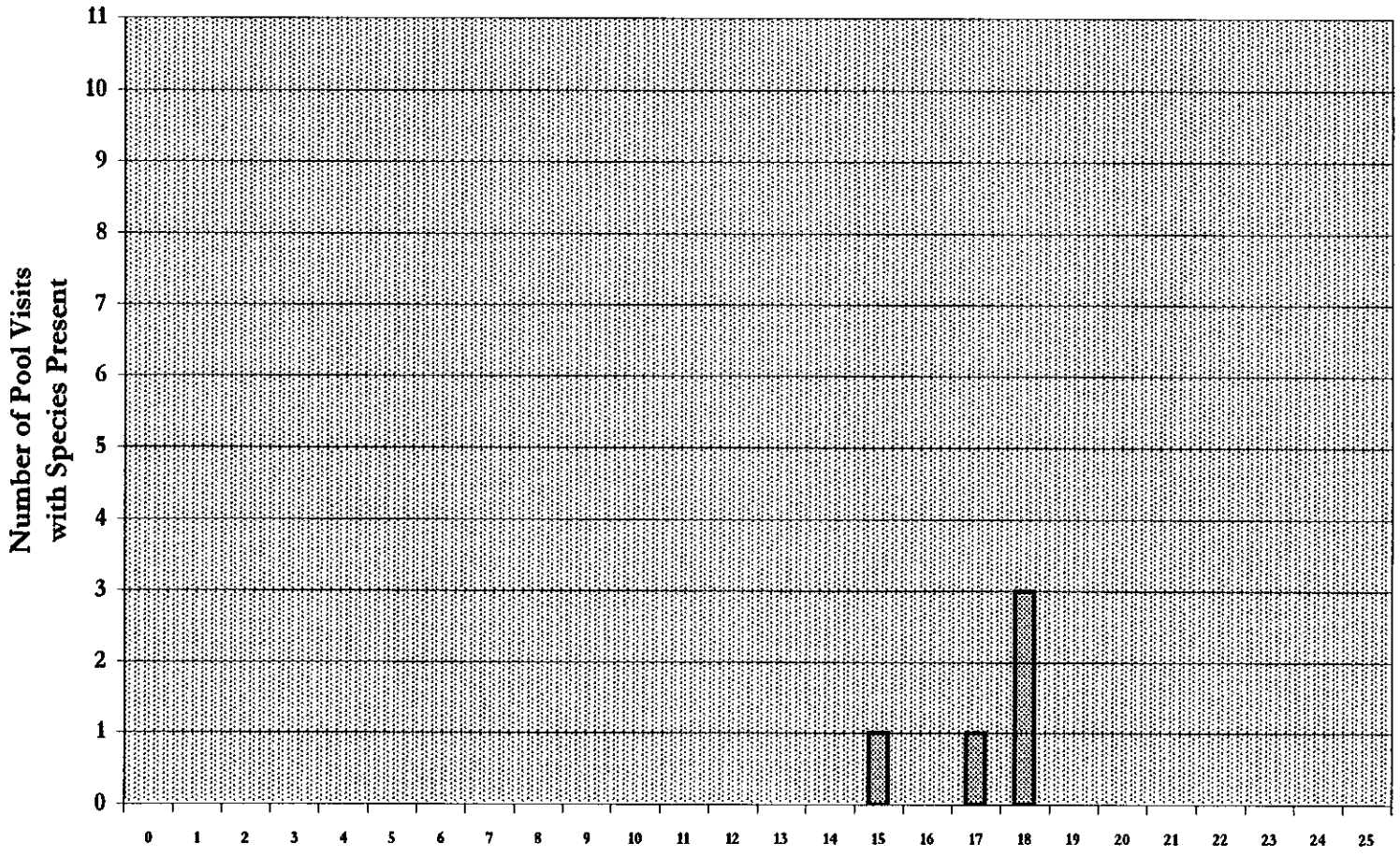


Figure 12
Estimated Population Size of Vernal Pool Tadpole Shrimp (*Lepidurus packardi*) During Vernal Pool Visits

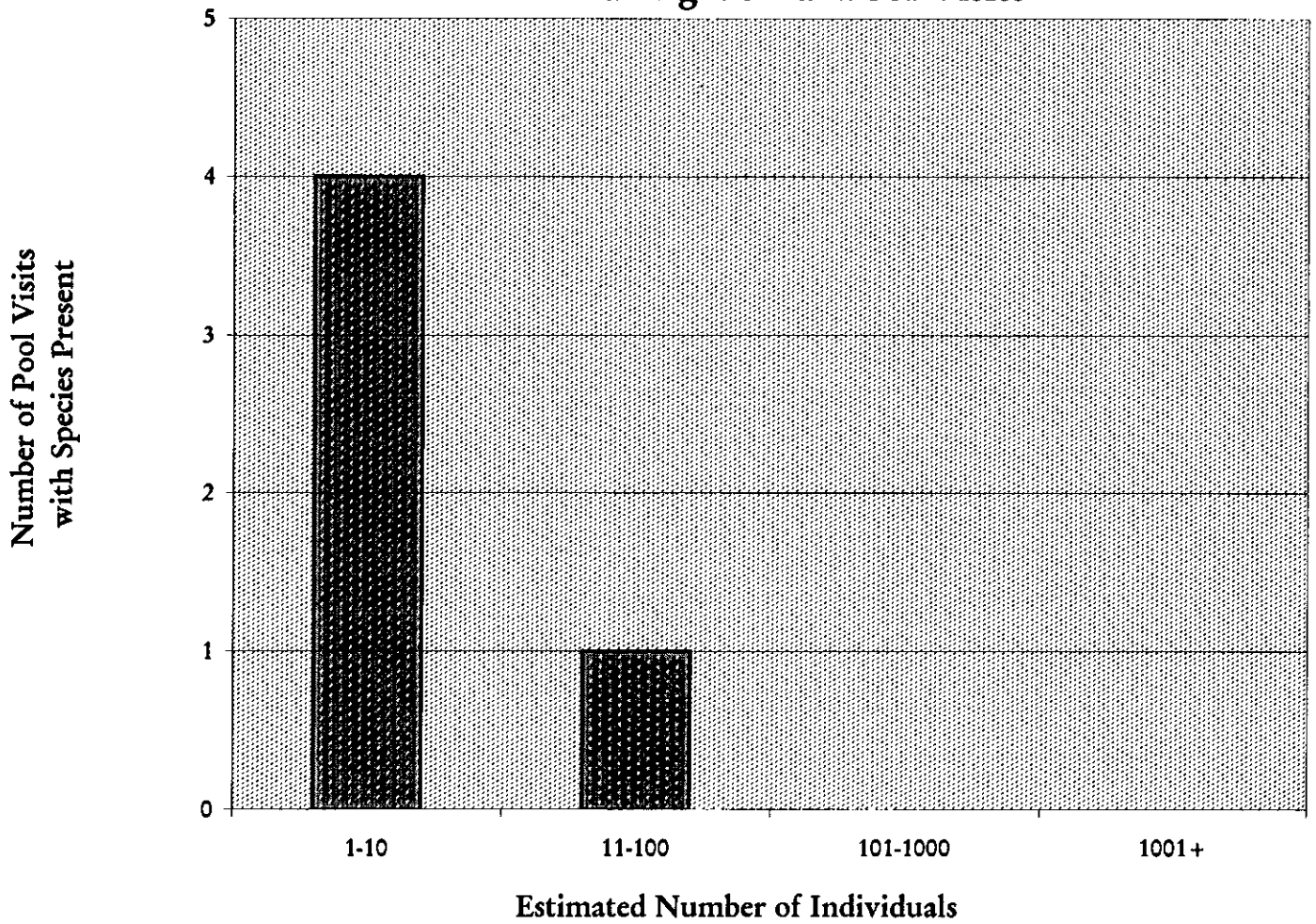


TABLE 5

Frequency of Occurrence of Midvalley Fairy Shrimp *(Branchinecta* sp.*)* within each Watershed Subbasin

Watershed Subbasin	Number of Vernal Pools Sampled within Watershed Subbasin	Vernal Pools with *Branchinecta* sp.	Frequency of Occurrence
BR02	24	0	0.00%
BR03A	26	0	0.00%
BR03B	26	0	0.00%
BR05	22	0	0.00%
BR06	26	0	0.00%
BR10	22	2	9.09%
BR12	27	0	0.00%
FC02	26	0	0.00%
FC03	24	0	0.00%
FC05	12	0	0.00%
FC08	20	0	0.00%
FC10	34	1	2.94%
LG01	26	2	7.69%
LG02	31	4	12.90%
LG03	20	12	60.00%
LG04	26	2	7.69%
LG05	19	3	15.79%
LG06	30	8	26.67%
LG08	26	0	0.00%
LG09	26	6	23.08%
LG14	26	0	0.00%
LG15	3	0	0.00%
MC02	39	5	12.82%
MC03	26	3	11.54%
MC05	17	0	0.00%
MC06	26	1	3.85%
MC07	26	3	11.54%
YL01	26	2	7.69%
YL02	31	0	0.00%
TOTAL	**713**	**54**	7.57%

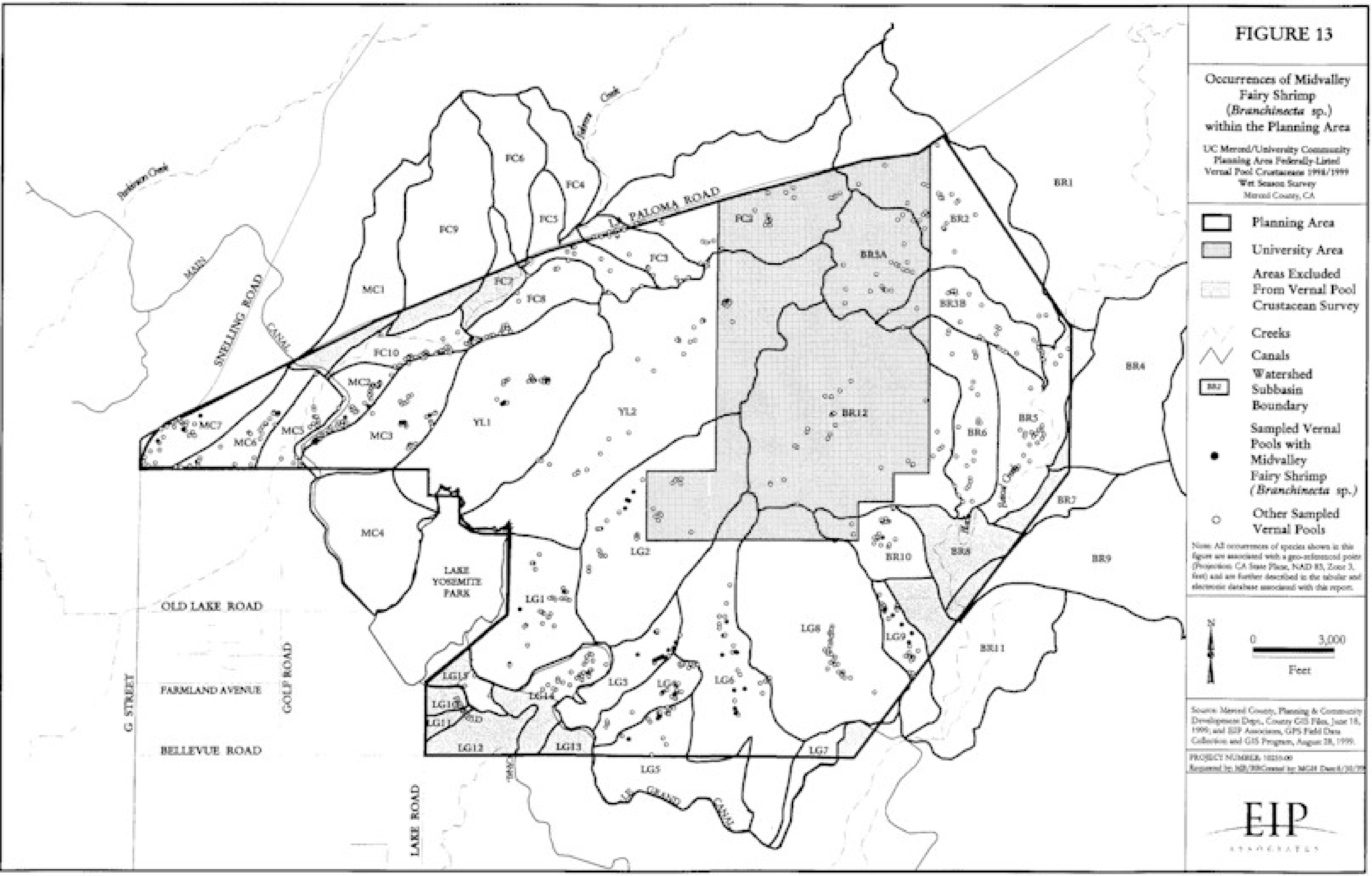


FIGURE 13
Occurrences of Midvalley Fairy Shrimp (*Branchinecta* sp.) within the Planning Area
UC Merced/University Community Planning Area Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey
Merced County, CA
Planning Area
University Area
Areas Excluded From Vernal Pool Crustacean Survey
Creeks
Canals
Watershed Subbasin Boundary
BR2
Sampled Vernal Pools with Midvalley Fairy Shrimp (*Branchinecta* sp.)
Other Sampled Vernal Pools
Note: All occurrences of species shown in this figure are associated with a geo-referenced point (Projection: CA State Plane, NAD 83, Zone 3, feet) and are further described in the tabular and electronic database associated with this report.
N
0
3,000
Feet
Source: Merced County, Planning & Community Development Dept., County GIS Files, June 18, 1999; and EIP Associates, GPS Field Data Collection and GIS Program, August 28, 1999.
EIP
ASSOCIATES
PALOMA ROAD
SNELLING ROAD
MAIN
CANAL
OLD LAKE ROAD
FARMLAND AVENUE
BELLEVUE ROAD
G STREET
GOLF ROAD
LAKE ROAD
LAKE YOSEMITE PARK
GRAND
CANAL
FC2
FC3
FC4
FC5
FC6
FC7
FC8
FC9
FC10
MC1
MC2
MC3
MC4
MC5
MC6
MC7
YL1
YL2
BR1
BR2
BR3A
BR3B
BR4
BR5
BR6
BR7
BR8
BR9
BR10
BR11
BR12
LG1
LG2
LG3
LG4
LG5
LG6
LG7
LG8
LG9
LG10
LG11
LG12
LG13
LG14
LG15

Figure 14
Presence of Midvalley Fairy Shrimp (*Branchinecta* sp.) vs. Vernal Pool Surface Area

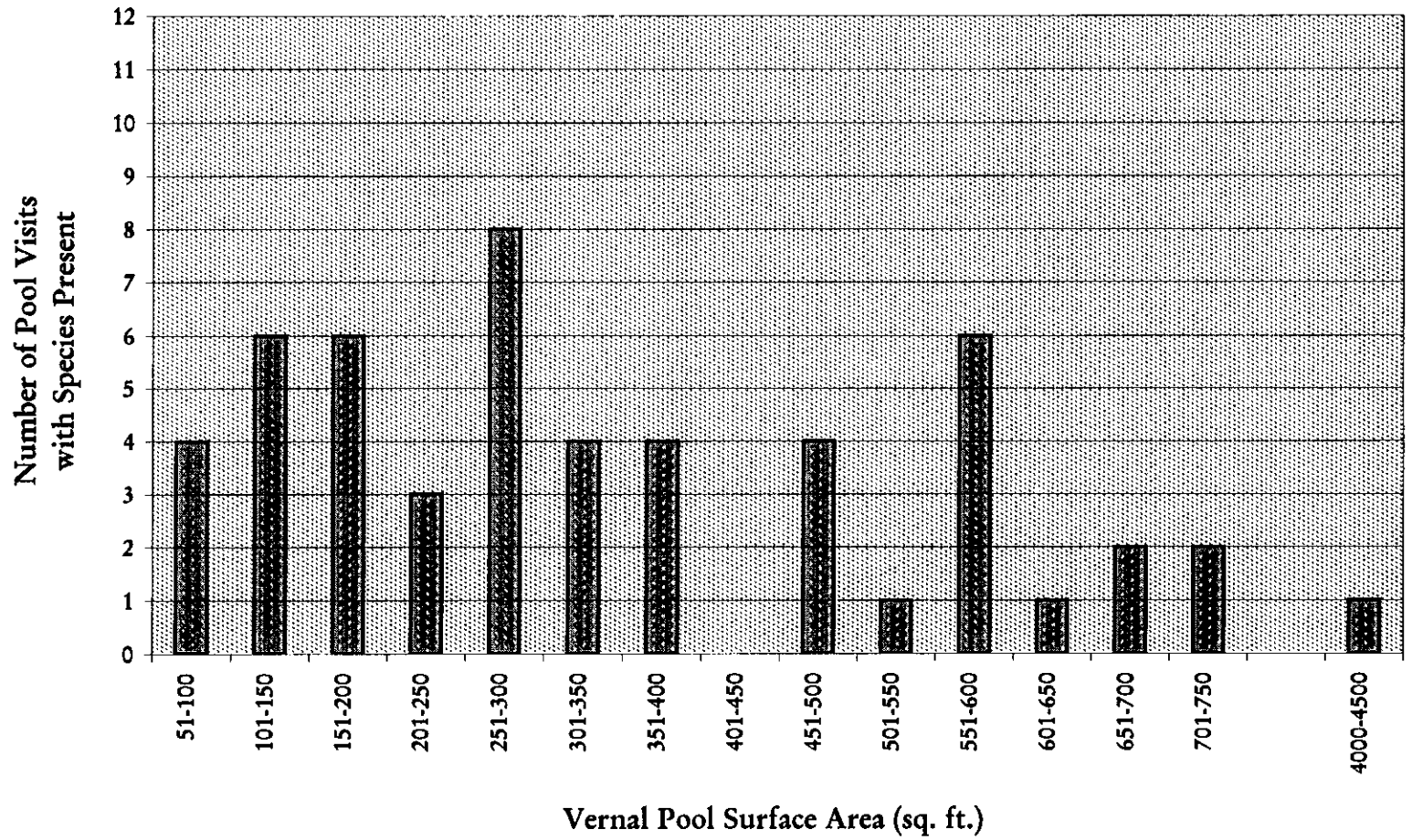


Figure 15
Presence of Midvalley Fairy Shrimp (*Branchinecta* sp.) vs. Inundation Depth

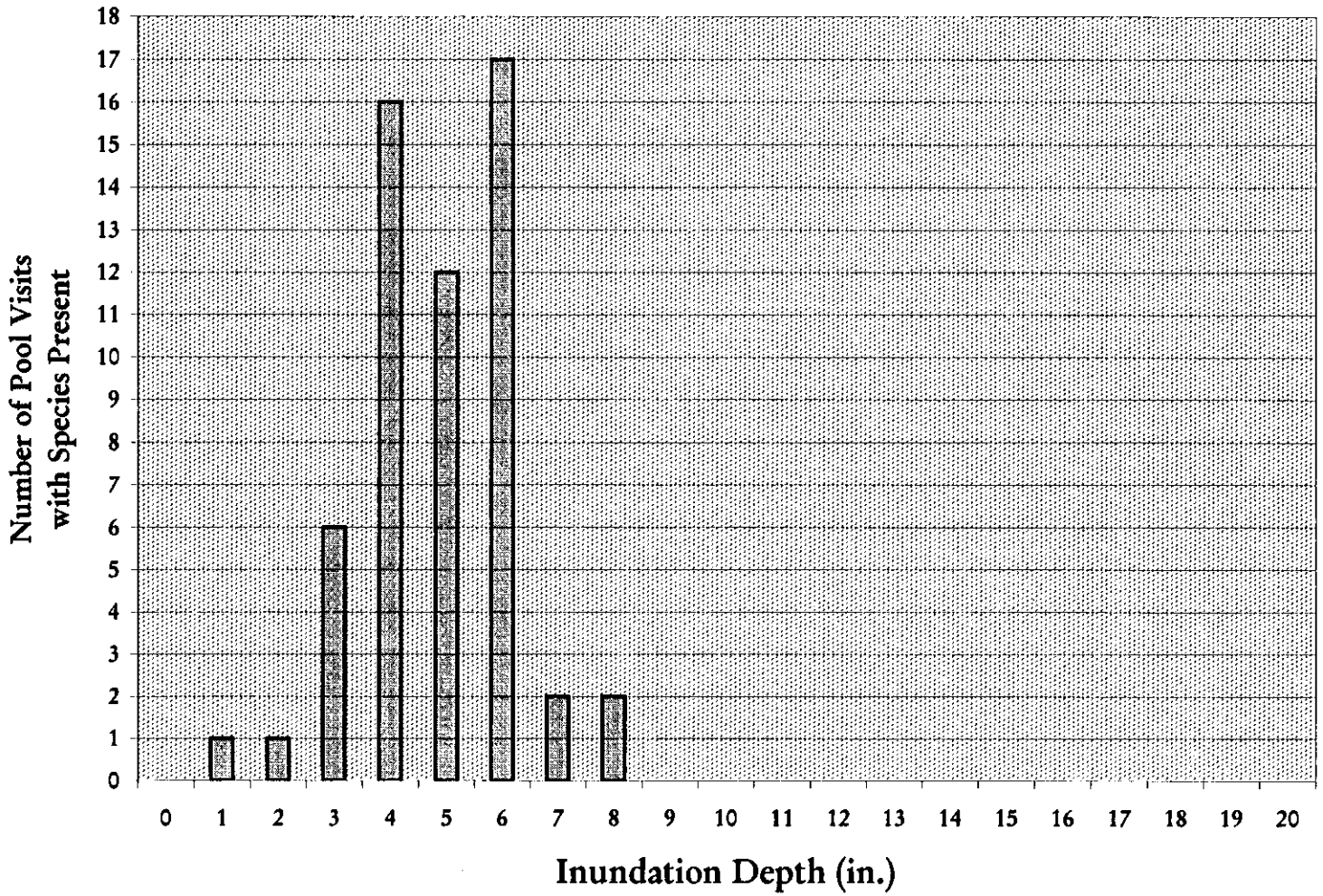


Figure 16
Presence of Midvalley Fairy Shrimp (*Branchinecta* sp.) vs. Water Temperature

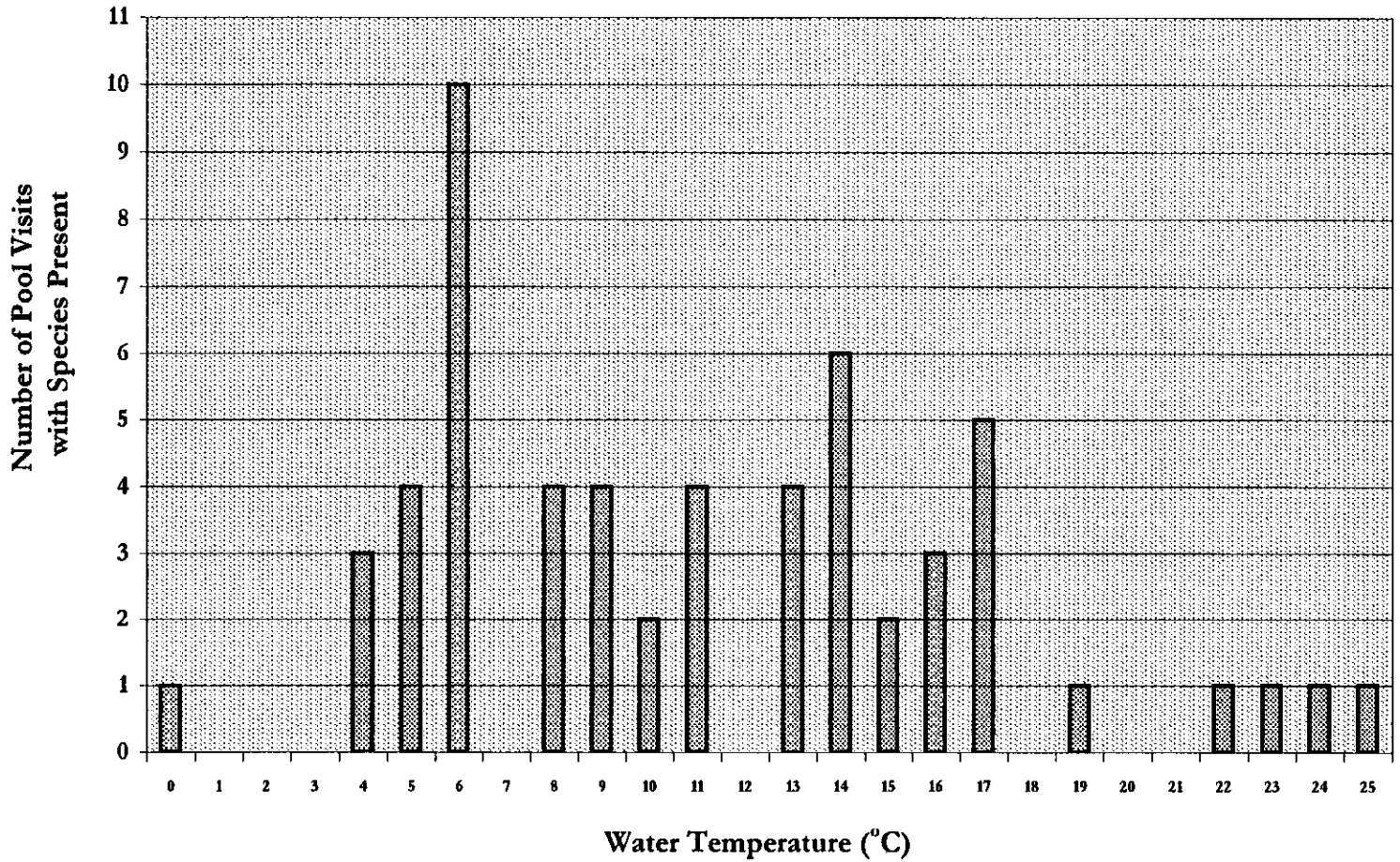
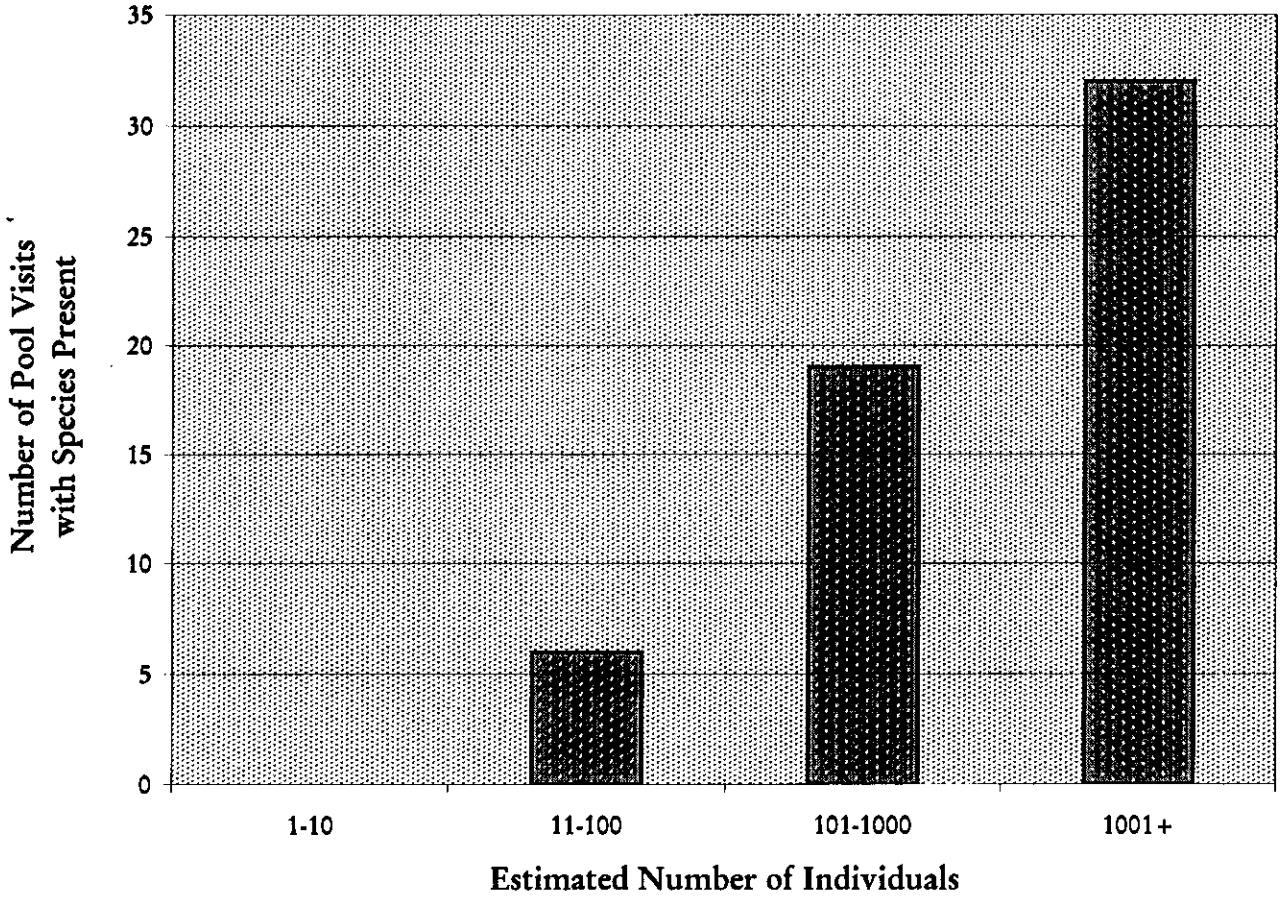


Figure 17
Estimated Population Size of Midvalley Fairy Shrimp (*Branchinecta* sp.) During Vernal Pool Visits



shrimp on these dates were respectively 562 sq. ft., 4 inches, and 14°C. The last sample date on which one of the 54 occupied pools contained water at least one inch deep (i.e., 2.5 cm) was March 3, 1999.

Conservancy Fairy Shrimp

Branchinecta conservatio was not found in any of the 713 vernal pools that were sampled within the study area. However, a reconnaissance-level survey of a vernal pool located on the Flying M Ranch (Figure 18), where *B. conservatio* was previously recorded (Eng et al., 1990), was conducted on February 18, 1999. The species was found to be present and extremely abundant. This very large (100,000+ sq. ft.), playa-type vernal pool is unlike any of the vernal pools located within the planning area. The pool on the Flying M Ranch is approximately five times larger than the largest sampled vernal pool (i.e., 20,000+ sq. ft.) within the study area. It should also be noted that the largest vernal pool within the study area during the 1998/1999 wet season was approximately four to five times larger than the next five largest sampled pools (4,800 to 7,200 sq. ft.). The pool on the Flying M Ranch was devoid of submergent vegetation, while emergent vegetation was sparse and limited to the margins of the pool (at least during the time of the survey). The pool was also extremely turbid with a high degree of suspended clay (from the underlying Peters clay 0-8 percent soils) that conveyed a milky appearance to the water. None of the sampled vernal pools or other observed vernal pools located within the study area exhibited these conditions. The measured water temperature in the pool was 14°C, while the inundation depth of the pool could not be measured due to difficulties in getting to the middle of the pool. However, the depth of the pool was estimated at between 30 and 36 inches from observations that were made after the pool dried.

Unidentified Branchinecta

The data base analysis indicates that only unidentified female or immature *Branchinecta* were collected from 140 vernal pools within the study area (20 percent of all sampled vernal pools within the study area) during one of the five sampling visits . However, mature male *Branchinecta* that were identifiable to species were found in all but 48 of these pools (7 percent of all sampled vernal pools within the study area) during subsequent visits to the pools (Table 6, Figure 19). Further analysis of the data base determined that 26 of these latter vernal pools were completely dry by the next two-week sampling period. Thus, the populations in these pools perished prior to any subsequent opportunity to sample the pools again. Sixteen of the remaining 22 pools contained extremely low estimated abundance of *Branchinecta* (i.e., 1 to 10 individuals). Although these latter pools contained water during one or more of the following sampling visits, *Branchinecta* were not observed in or collected from these pools during these later visits. It is likely that the populations in these pools also perished or that the populations were in such low numbers that they were not detected. Habitat data associated with the vernal pools in which definitive identification of *Branchinecta* sp. was not possible are summarized in Figures 20, 21, and 22. In addition, estimated size of the unidentified *Branchinecta* populations found in each of the 48 pools is summarized in Figure 23.

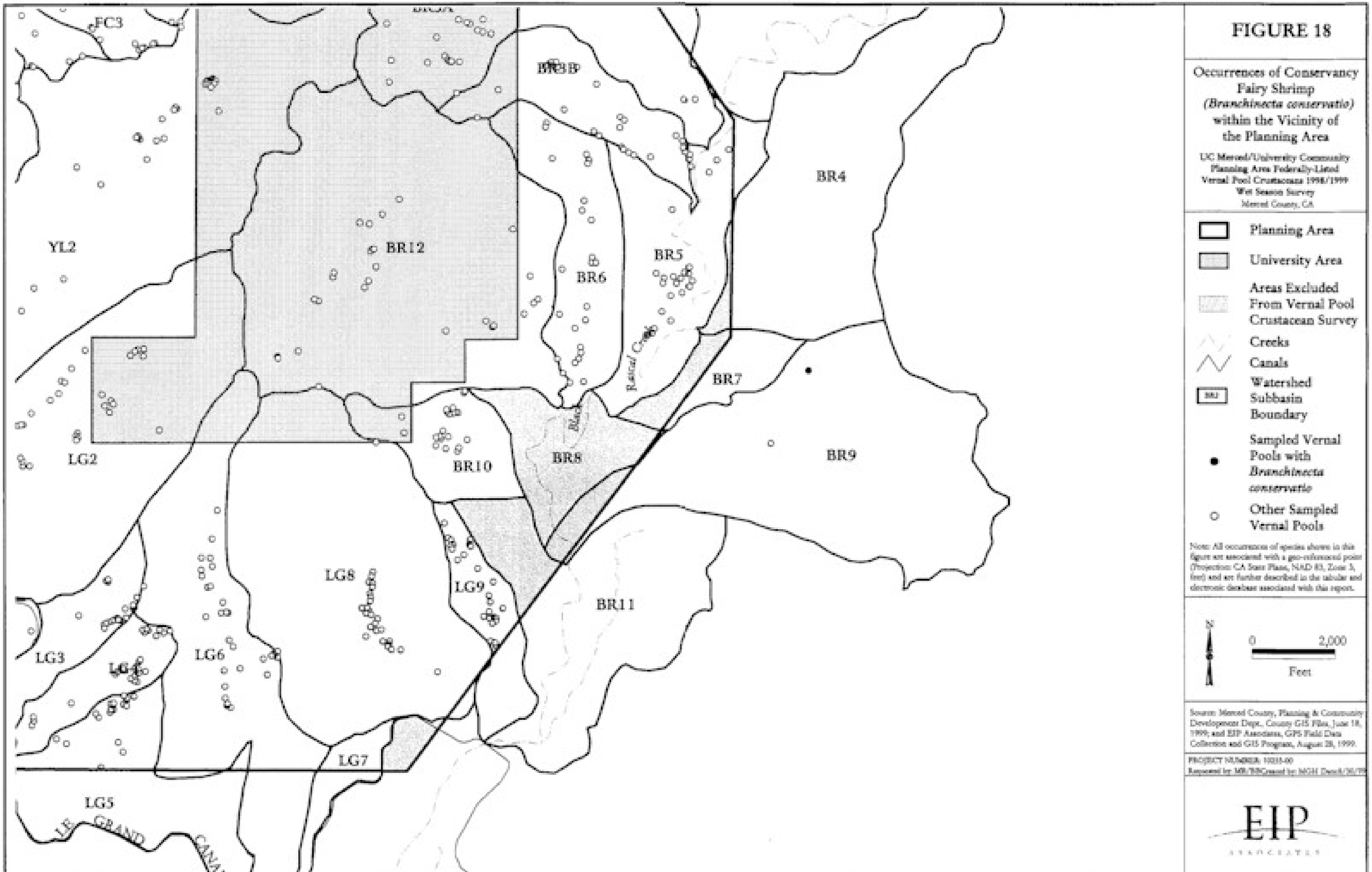


FIGURE 18
Occurrences of Conservancy Fairy Shrimp
(Branchinecta conservatio)
within the Vicinity of the Planning Area
UC Merced/University Community Planning Area Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey
Merced County, CA
Planning Area
University Area
Areas Excluded From Vernal Pool Crustacean Survey
Creeks
Canals
Watershed Subbasin Boundary
Sampled Vernal Pools with Branchinecta conservatio
Other Sampled Vernal Pools
Note: All occurrences of species shown in this figure are associated with a geo-referenced point (Projection: CA State Plane, NAD 83, Zone 3, feet) and are further described in the tabular and electronic database associated with this report.
N
0
2,000
Feet
Source: Merced County, Planning & Community Development Dept., County GIS Files, June 18, 1999; and EIP Associates, GPS Field Data Collection and GIS Program, August 28, 1999.
EIP
ASSOCIATES
FC3
BR3B
YL2
BR12
BR6
BR5
BR4
BR7
Rascal Creek
Black
BR10
BR8
BR9
LG2
LG8
LG9
BR11
LG3
LG4
LG6
LG7
LG5
LE GRAND CANAL

TABLE 6

Frequency of Occurrence of Unidentified *Branchinecta* sp. within each Watershed Subbasin

Watershed Subbasin	Number of Vernal Pools Sampled within Watershed Subbasin	Vernal Pools with *Branchinecta* sp.	Frequency of Occurrence
BR02	24	3	12.50%
BR03A	26	2	7.69%
BR03B	26	3	11.54%
BR05	22	3	13.64%
BR06	26	6	23.08%
BR10	22	1	4.55%
BR12	27	3	11.11%
FC02	26	0	0.00%
FC03	24	1	4.17%
FC05	12	0	0.00%
FC08	20	1	5.00%
FC10	34	1	2.94%
LG01	26	0	0.00%
LG02	31	2	6.45%
LG03	20	0	0.00%
LG04	26	4	15.38%
LG05	19	2	10.53%
LG06	30	1	3.33%
LG08	26	2	7.69%
LG09	26	1	3.85%
LG14	26	3	11.54%
LG15	3	0	0.00%
MC02	39	0	0.00%
MC03	26	3	11.54%
MC05	17	0	0.00%
MC06	26	2	7.69%
MC07	26	2	7.69%
YL01	26	1	3.85%
YL02	31	1	3.23%
TOTAL	**713**	**48**	**6.73%**

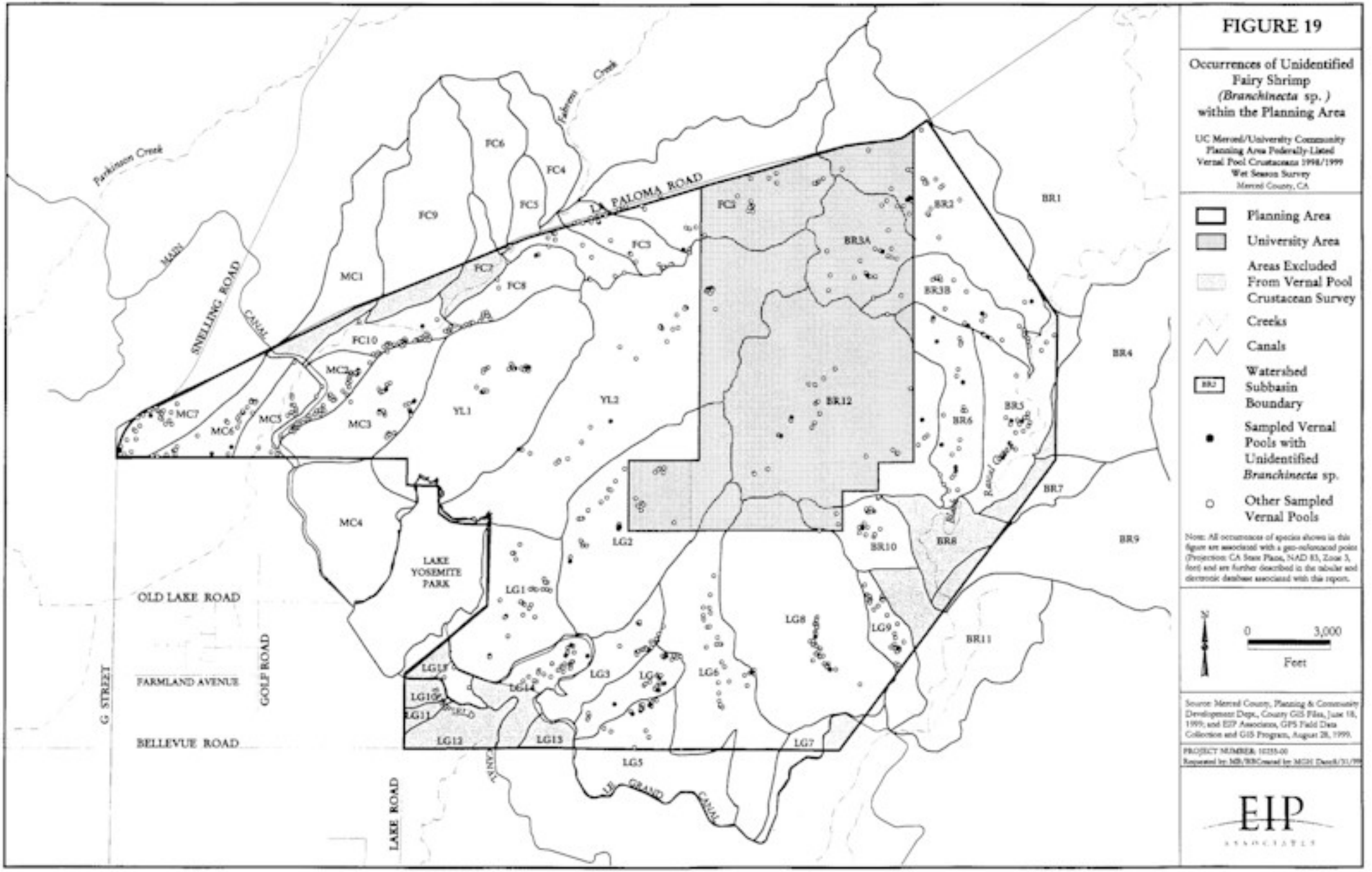


FIGURE 19

Occurrences of Unidentified Fairy Shrimp (*Branchinecta* sp.) within the Planning Area

UC Merced/University Community Planning Area Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey
Merced County, CA

- Planning Area
- University Area
- Areas Excluded From Vernal Pool Crustacean Survey
- Creeks
- Canals
- BR2 Watershed Subbasin Boundary
- Sampled Vernal Pools with Unidentified *Branchinecta* sp.
- Other Sampled Vernal Pools

Note: All occurrences of species shown in this figure are associated with a geo-referenced point (Projection: CA State Plane, NAD 83, Zone 3, feet) and are further described in the tabular and electronic database associated with this report.

N

0 3,000

Feet

Source: Merced County, Planning & Community Development Dept., County GIS Files, June 18, 1999; and EIP Associates, GPS Field Data Collection and GIS Program, August 28, 1999.

PROJECT NUMBER: 10255-00
Requested by: MB/BR Created by: MGH Date: 8/31/99

EIP ASSOCIATES

Figure 20
Presence of Unidentified *Branchinecta* sp. vs. Vernal Pool Surface Area

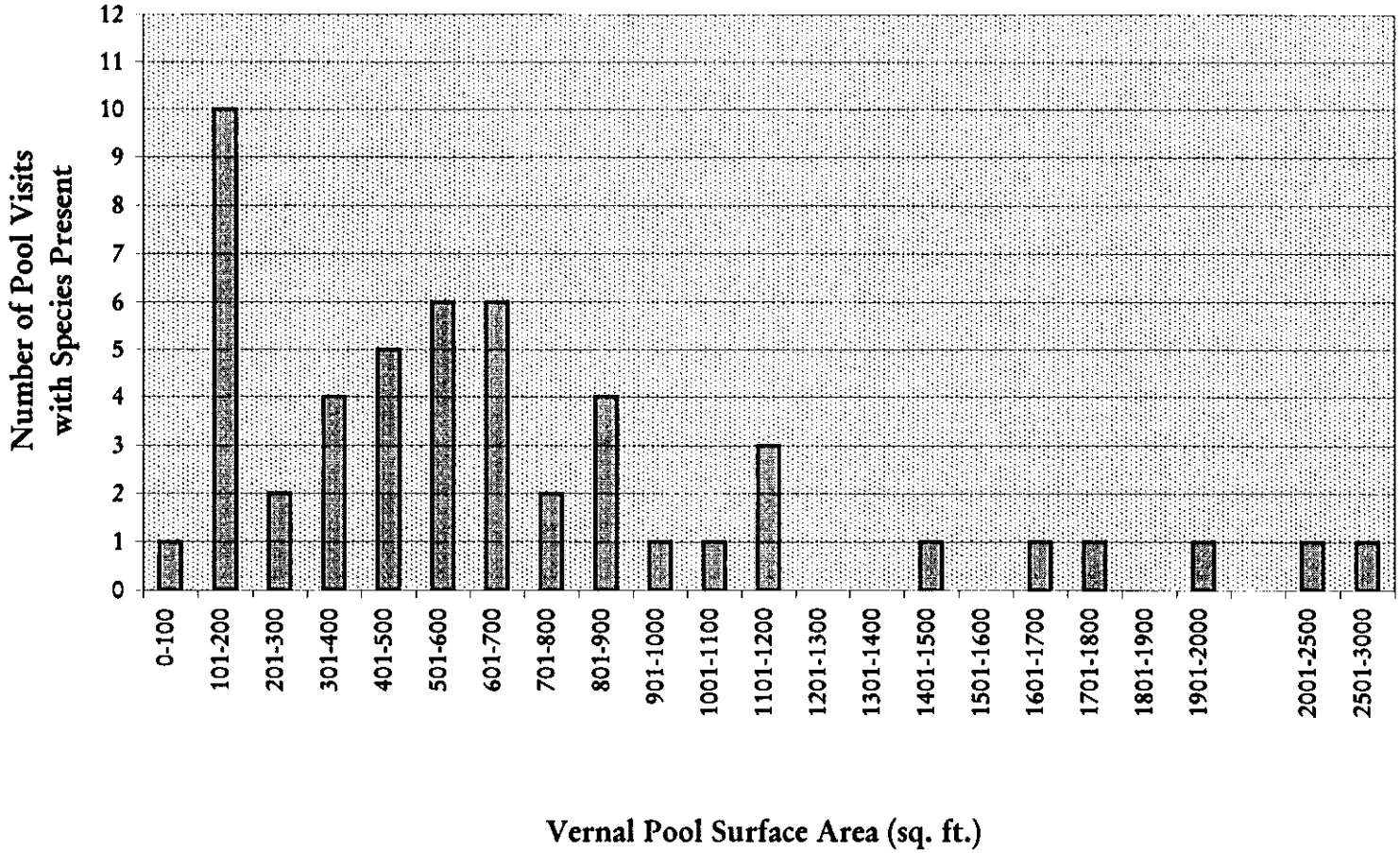


Figure 21
Presence of Unidentified Fairy Shrimp (*Branchinecta* sp.) vs. Inundation Depth

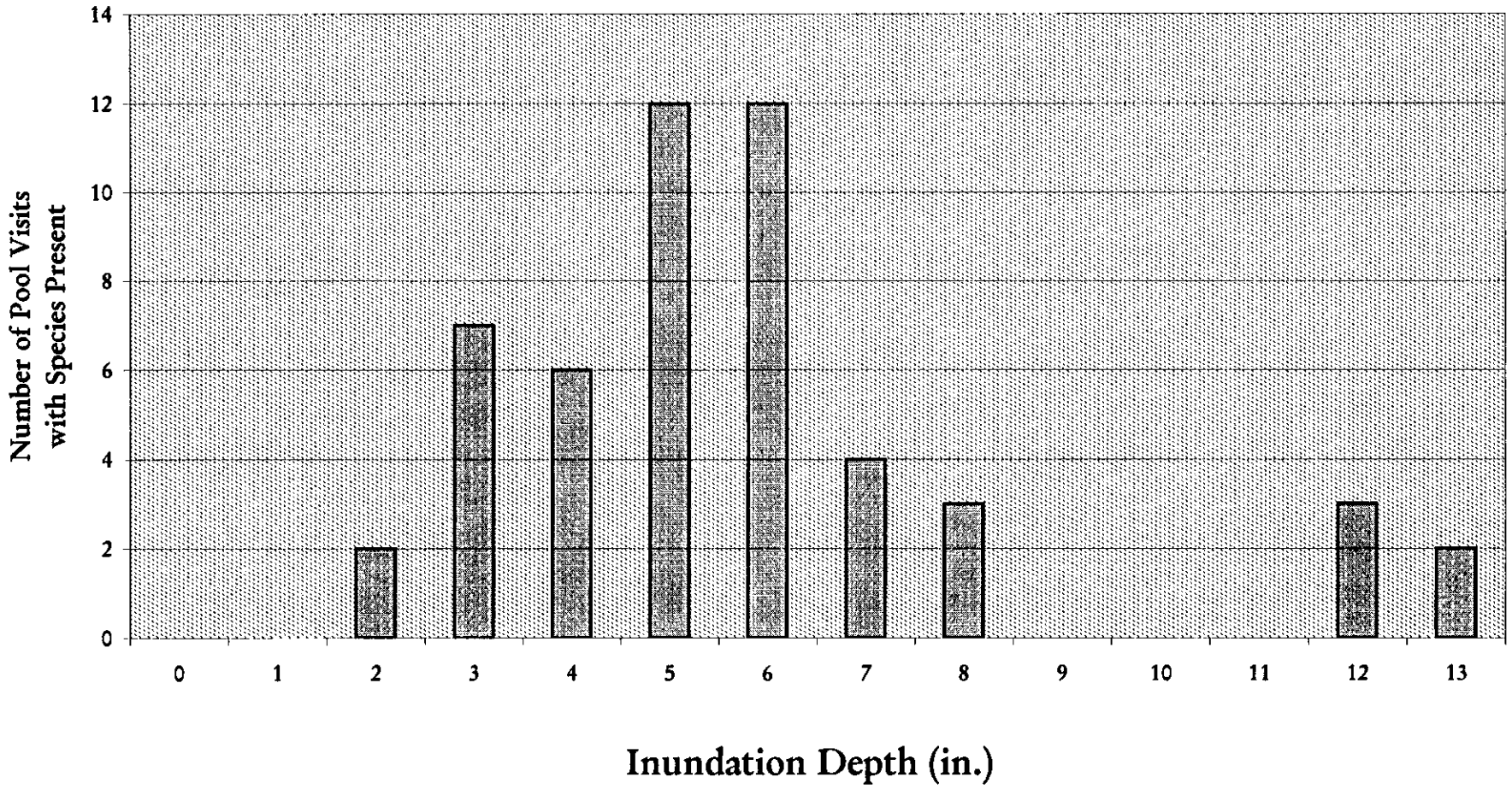


Figure 22
Presence of Unidentified *Branchinecta* sp. vs. Water Temperature

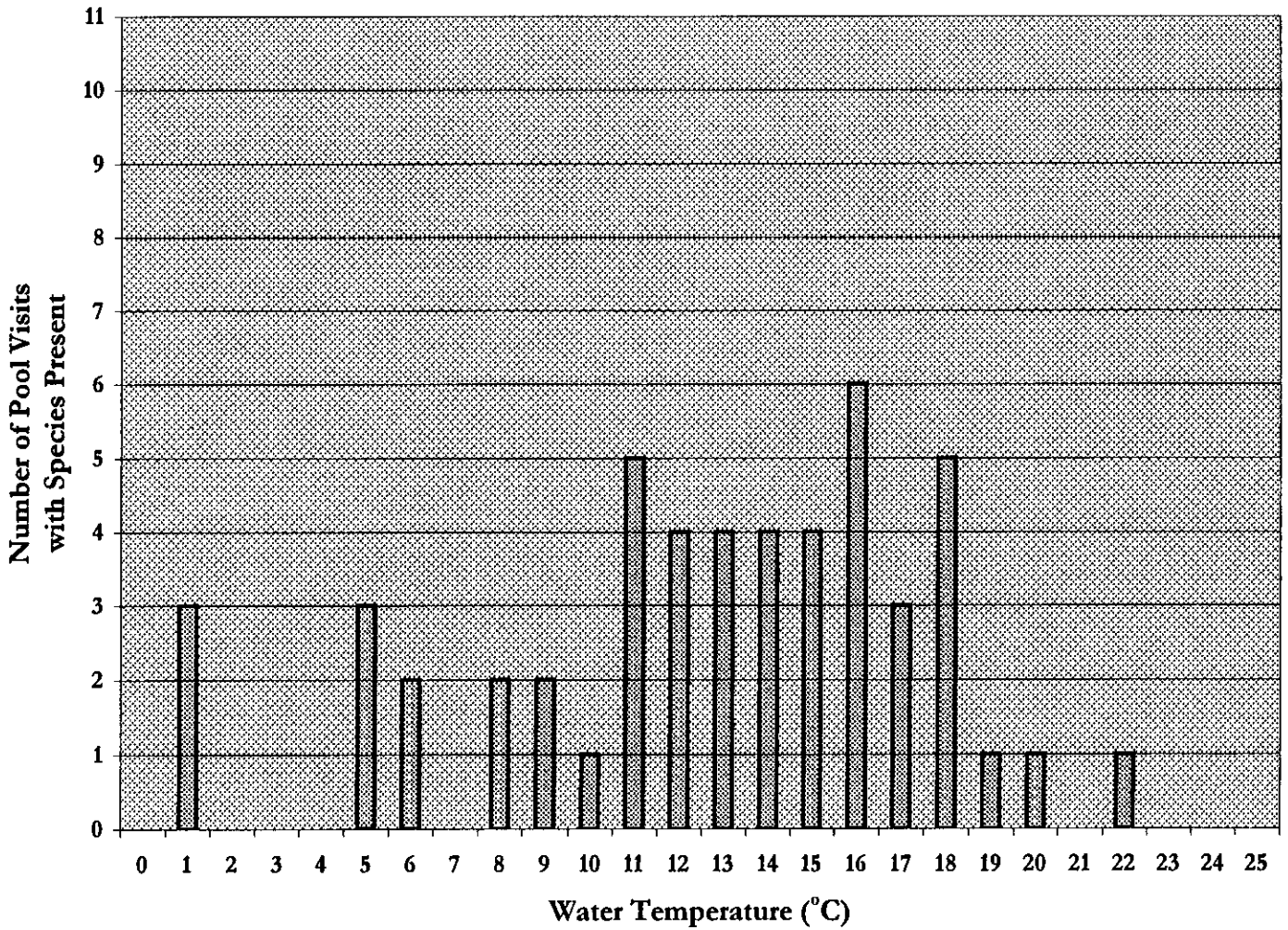
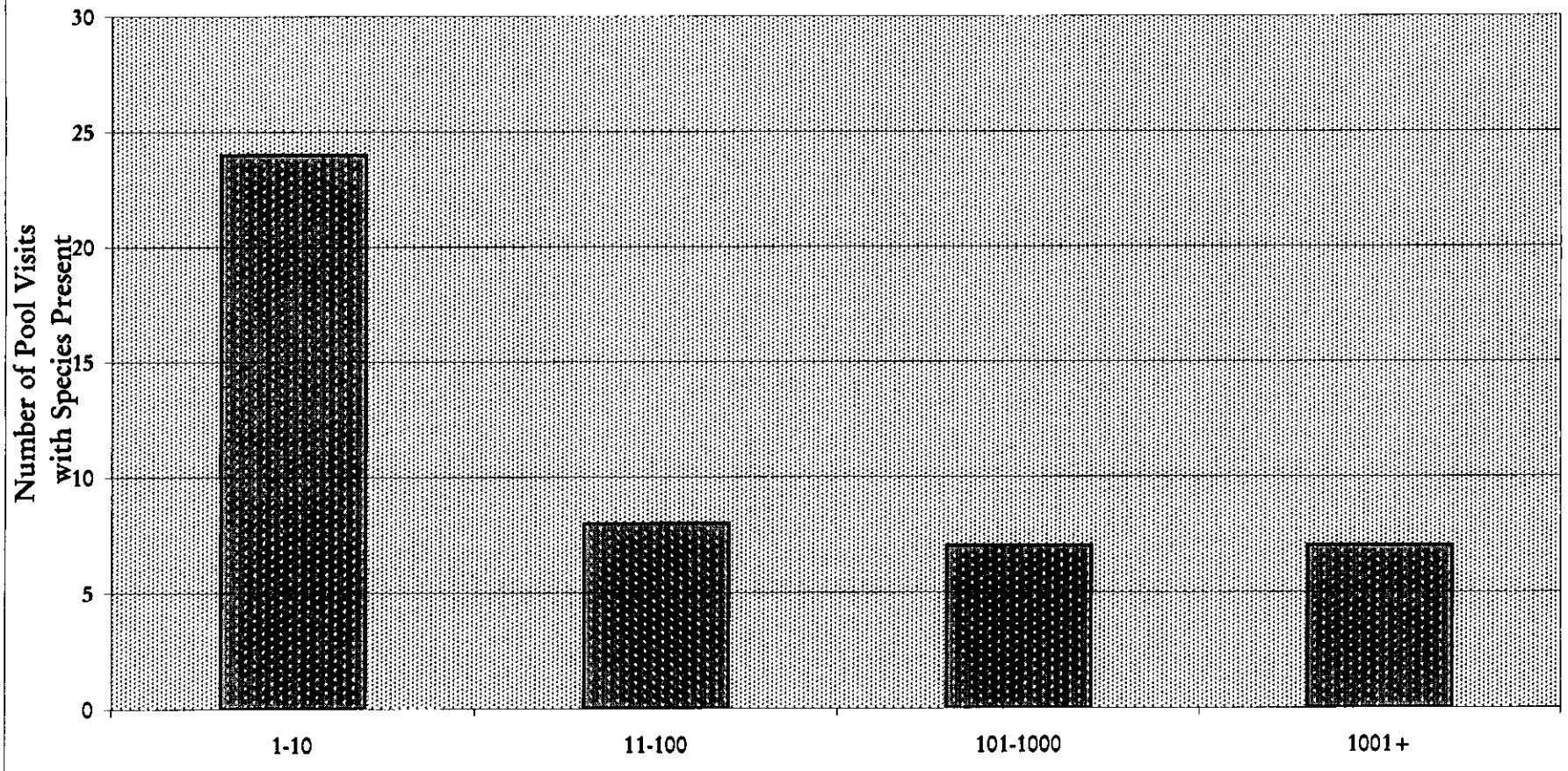


Figure 23
Estimated Population Size of Unidentified Fairy Shrimp (*Branchinecta* sp.) During Vernal Pool Visits



Other Vernal Pool Crustaceans

A variety of other vernal pool crustaceans were also documented from the planning area. These species included seed shrimp as well as other branchiopod species such as California clam shrimp (*Cyzicus californicus*) and California fairy shrimp (*Linderiella occidentalis*). *L. occidentalis* is currently considered to be a Special Species by the California Department of Fish and Game and as such is tracked by that agency. It was formerly proposed for listing under the Endangered Species Act (57 Federal Register 19856), but was withdrawn when additional information revealed that is was more abundant and widely distributed than previously known (59 Federal Register 48136). *L. occidentalis* was found to occur within 49 vernal pools (7 percent of the sampled vernal pools within the study area), where it co-occurred with *Branchinecta* sp. in 42 pools (86 percent of the pools that California fairy shrimp was found in)(Table 4). It was most prevalent in the pools located in the watershed subbasins associated with the Main Canal (Figure 24). A summary of the distribution of *L. occidentalis* within sampled vernal pools in the planning area is provided in Table 7. In addition, all habitat data that was collected for the previous species was also collected for *L. occidentalis*. In summary, *L. occidentalis* was found in vernal pools that ranged in size from 10 to 6,000 sq. ft. ($\bar{x}$=1,286 sq. ft., n=56 visits) (Figure 25), had pool inundation depths between 1 and 20 inches ($\bar{x}$=7 inches, n=56 visits) (Figure 26), and exhibited water temperatures between 3 and 25°C (Figure 27). Estimated population size for *L. occidentalis* in each of the occupied pools was not recorded.

Other Vernal Pool Fauna

Surveys were conducted concurrently for vernal pool amphibians during the vernal pool crustacean surveys. The target of these surveys were California tiger salamander (*Ambystoma californiense*) and western spadefoot (*Scaphiopus hammondii*). Although neither of these latter species were documented in vernal pools in the planning area, the Pacific tree frog (*Hyla regilla*) was encountered in 27 sampled vernal pools. This latter species was the only amphibian found during the 1998/1999 wet season surveys.

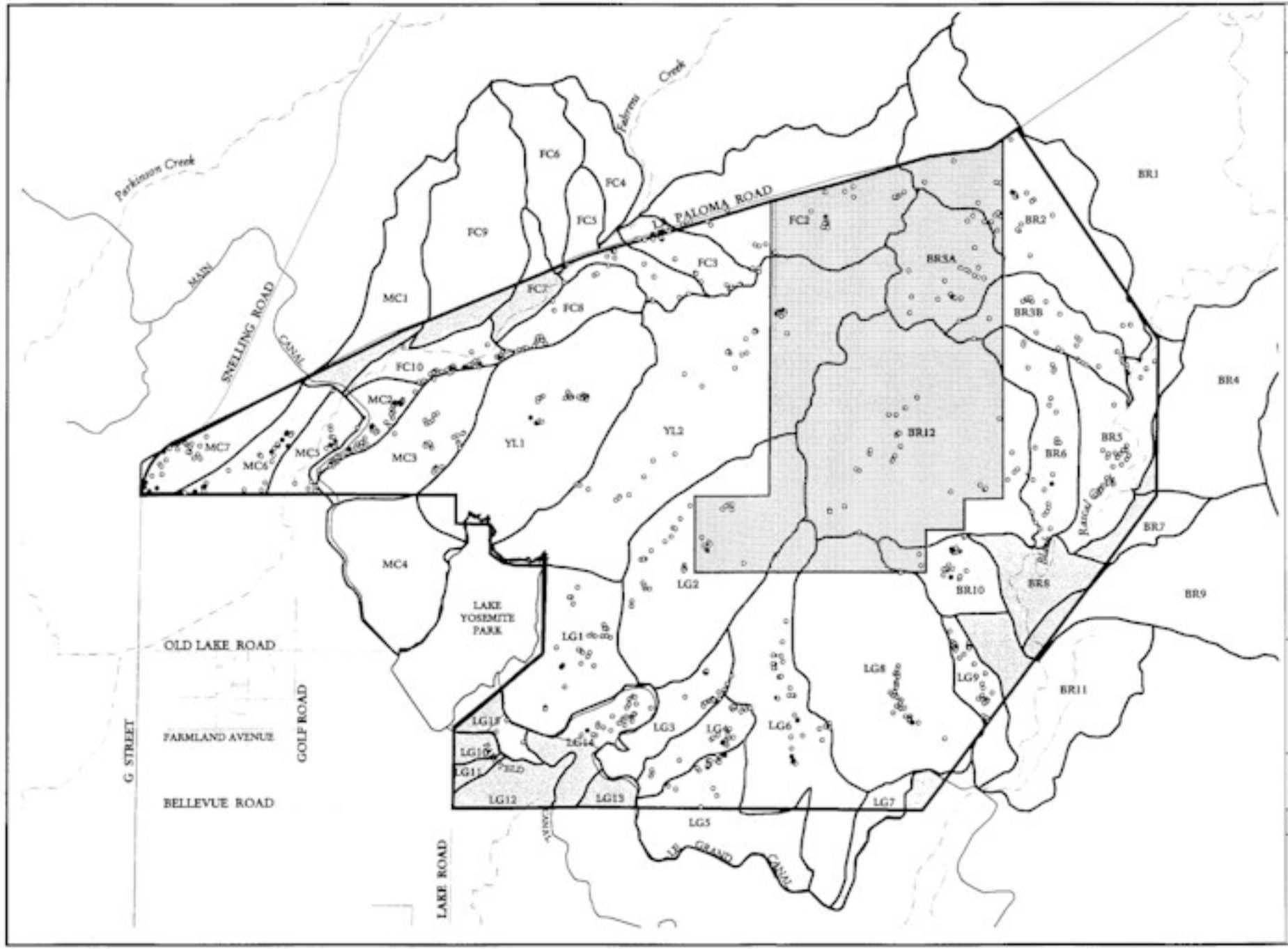


FIGURE 24

Occurrences of California Fariy Shrimp *(Linderiella occidentalis)* within the Planning Area

UC Merced/University Community Planning Area Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey

Merced County, CA

- Planning Area
- University Area
- Areas Excluded From Vernal Pool Crustacean Survey
- Creeks
- Canals
- BR2 — Watershed Subbasin Boundary
- Sampled Vernal Pools with *Linderiella occidentalis*
- Other Sampled Vernal Pools

Note: All occurrences of species shown in this figure are associated with a geo-referenced point (Projection: CA State Plane, NAD 83, Zone 3, feet) and are further described in the tabular and electronic database associated with this report.

N

0 3,000

Feet

Source: Merced County, Planning & Community Development Dept., County GIS Files, June 18, 1999, and EIP Associates, GPS Field Data Collection and GIS Program, August 28, 1998.

PROJECT NUMBER: 10250.00
Requested by: MB/BR Created by: MGH Date: 8/31/99

EIP ASSOCIATES

TABLE 7

Frequency of Occurrence of California Fairy Shrimp (*Linderiella occidentalis*) within each Watershed Subbasin

Watershed Subbasin	Number of Vernal Pools Sampled within Watershed Subbasin	Vernal Pools with *Linderiella occidentalis*	Frequency of Occurrence
BR02	24	1	4.17%
BR03A	26	0	0.00%
BR03B	26	1	3.85%
BR05	22	0	0.00%
BR06	26	1	3.85%
BR10	22	2	9.09%
BR12	27	0	0.00%
FC02	26	0	0.00%
FC03	24	4	16.67%
FC05	12	1	8.33%
FC08	20	0	0.00%
FC10	34	4	11.76%
LG01	26	1	3.85%
LG02	31	1	3.23%
LG03	20	0	0.00%
LG04	26	1	3.85%
LG05	19	1	5.26%
LG06	30	3	10.00%
LG08	26	1	3.85%
LG09	26	0	0.00%
LG14	26	1	3.85%
LG15	3	0	0.00%
MC02	39	4	10.26%
MC03	26	1	3.85%
MC05	17	3	17.65%
MC06	26	9	34.62%
MC07	26	8	30.77%
YL01	26	1	3.85%
YL02	31	0	0.00%
TOTAL	**713**	**49**	**6.87%**

Figure 25
Presence of California Fairy Shrimp (*Linderiella occidentalis*) vs. Vernal Pool Surface Area

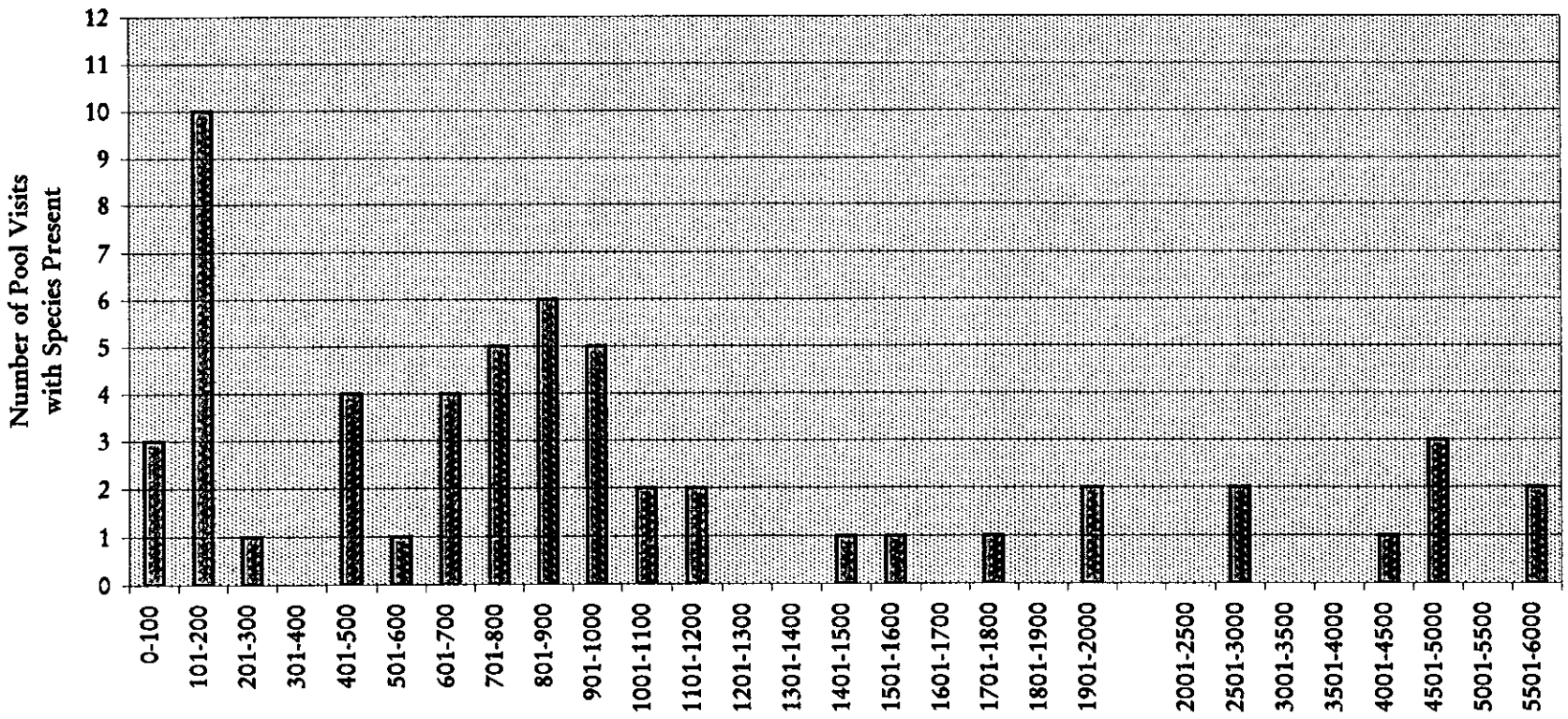


Figure 26
Presence of California Fairy Shrimp (*Linderiella occidentalis*) vs. Inundation Depth

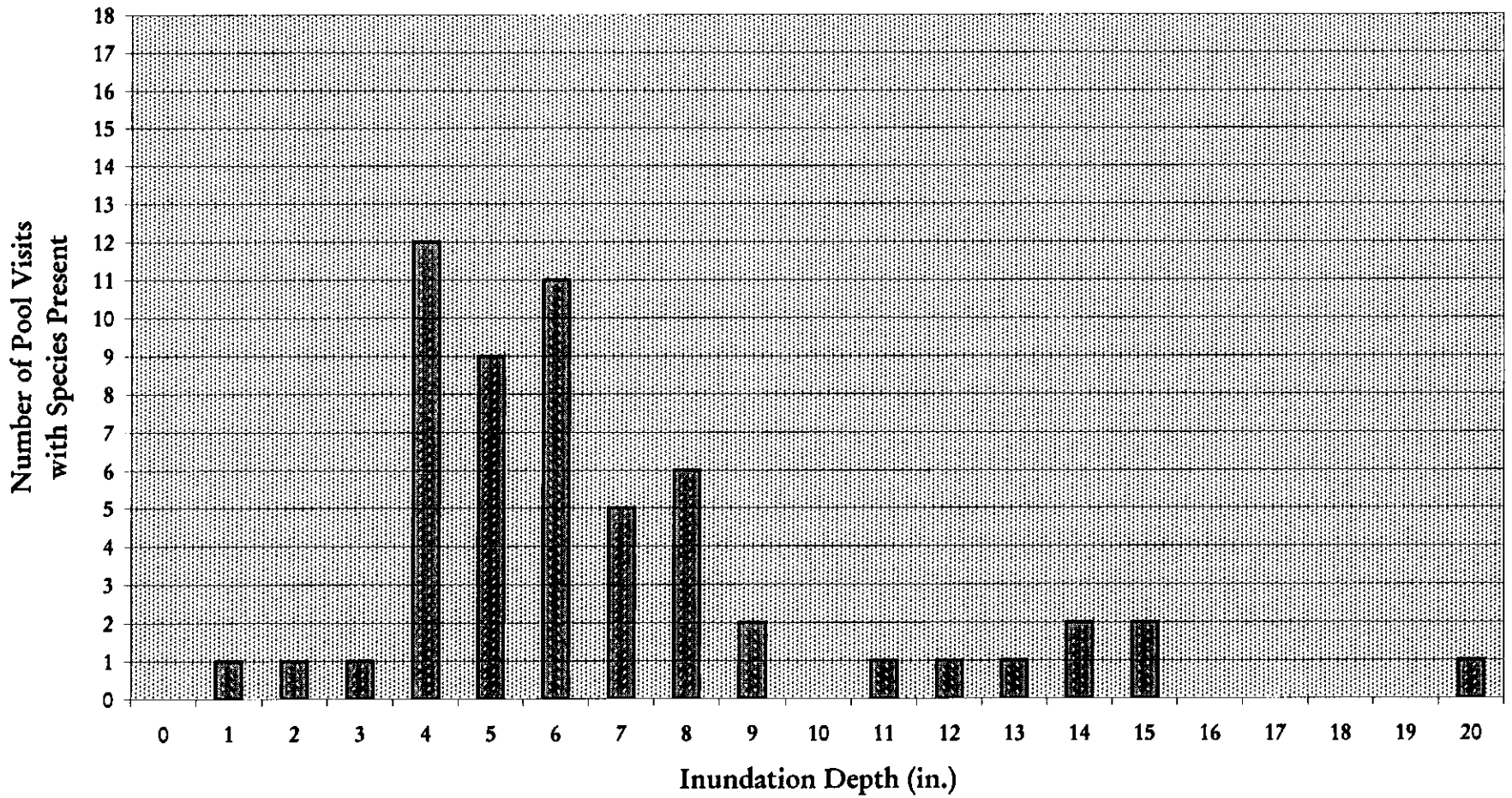


Figure 27
Presence of California Fairy Shrimp
(*Linderiella occidentalis*) vs. Water Temperature

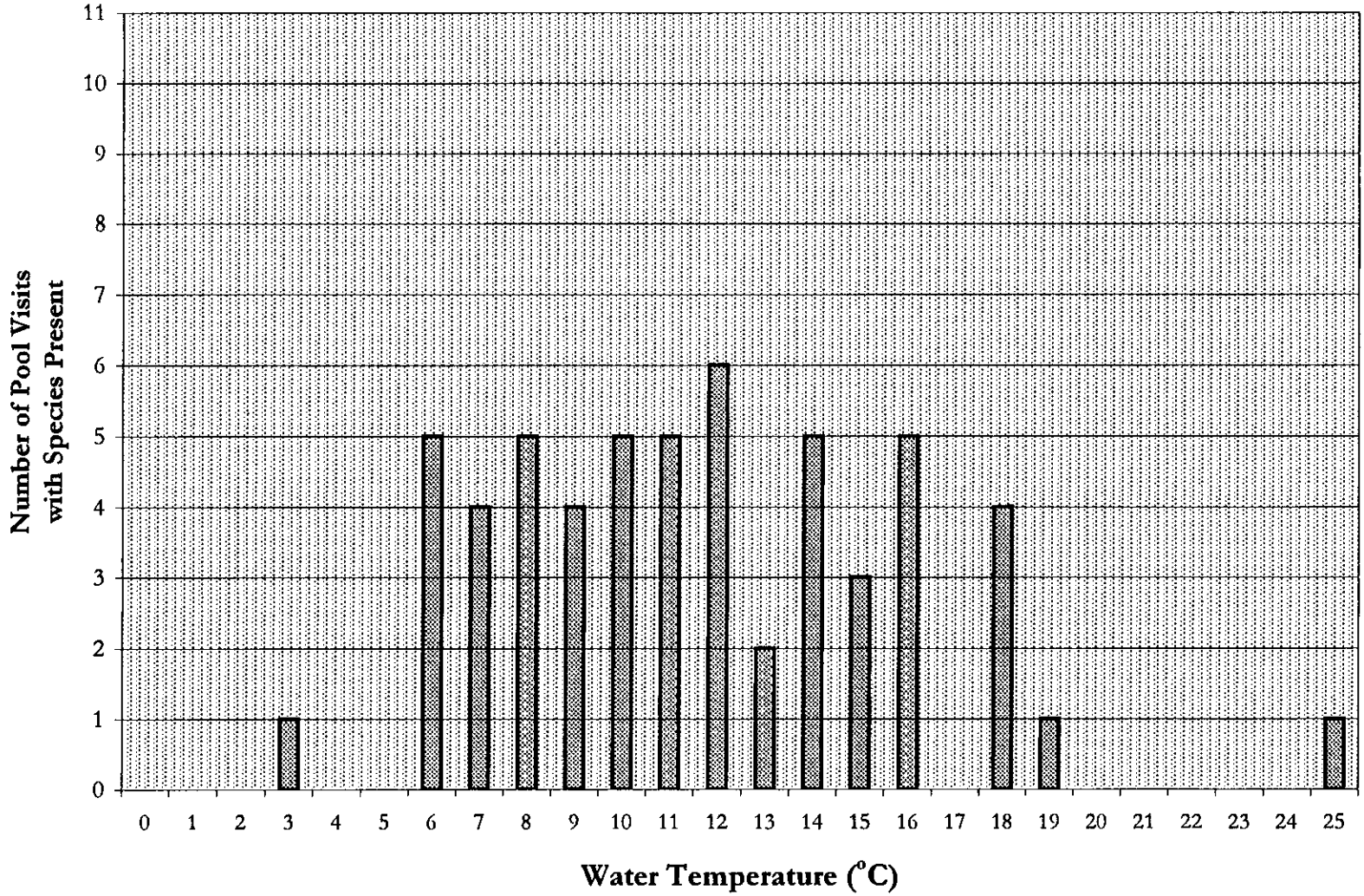


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EXHIBIT 1

CORRESPONDENCE FROM EIP ASSOCIATES TO U.S. FISH AND WILDLIFE SERVICE

January 19, 1999

Mr. Chris Davis
San Joaquin Valley Endangered Species Branch
United States Fish and Wildlife Service
3310 El Camino, Suite 130
Sacramento, CA 95821-6340

SUBJECT: Authorization For Representative Wet Season Sampling Surveys for Federally-listed Vernal Pool Crustaceans Within the UCCP Area

Dear Mr. Davis:

On behalf of the University of California and Merced County, EIP Associates (EIP) proposes to conduct wet season sampling surveys for federally-listed vernal pool crustaceans that are within areas of proposed direct impact within the University Community Concept Plan (UCCP) area in Merced. The UCCP area is comprised of the proposed University of California, Merced campus area and surrounding university community. The total area is approximately 10,400 acres.

EIP will follow a survey protocol that is designed to identify the presence and distribution of vernal pool branchiopods within the UCCP area (particularly *Branchinecta conservatio*). The survey protocol emulates the April 19, 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* where possible, but includes a variety of deviations that reflect the intended purpose of the surveys, environmental constraints associated with the UCCP area and the 1998/1999 wet season weather conditions. These various deviations from the above referenced protocol were agreed upon during meetings between EIP and the USFWS on January 6, 1999 and subsequent phone discussions. The deviations are outlined in Table 1.

The survey protocol involves a representative sampling program that will provide coverage of each of the 18 watershed subbasins that have the potential to be directly affected by development (Figure 1). No sampling will be conducted in watersheds that would not have the potential tobe affected by development. Under this methodology up to 26 vernal pools per watershed subbasin would be surveyed (for a minimum of 458 vernal pools). The surveys will be initiated during the wet season of 1998/1999 within two weeks of the vernal pools filling and holding at least 2.5 cm of standing water at least 12 hours after a rain event. Each vernal pool that is sampled will be geo-referenced using a real time global positioning system (GPS) unit.

The surveys will utilize a standard "D" style dipnet with a mesh size of no greater than 1/8 inch. The frequency of sampling points at any given vernal pool will vary, but generally will consist of a sample point at least every five feet (around the pool perimeter) on pools that are less than 20 feet in diameter and at least every 12 feet on pools that are greater than 20 feet in diameter. Data collected from the surveyed vernal pools will be recorded on standard data sheets (i.e., USFWS Vernal Pool Data Sheet for Wet Season Surveys). Voucher specimens of federally-listed vernal pool crustaceans will be collected and preserved according to the November 29, 1994 standards of the California Academy of Sciences (Invertebrate Zoology and Geology Department) and will include no more than 20 individuals of each federally-listed species or less than 10% of the subpopulation in the vernal pool (whichever is the lesser amount) collected during each visit. All voucher specimens will consist of sexually mature individuals and be accessioned to the California Academy of Sciences. A Vernal Pool Crustacean Survey Report describing the distribution of federally-listed vernal pool crustacean records within the study area will be prepared upon completion of the surveys.

Subsequent to the January 6, 1999 meeting, the USFWS used the equation $(1-a)^x=b$ to determine the number of vernal pools that would need to be surveyed to meet the confidence requirements of the USFWS. Assumptions that were used in calculating the value of x (i.e., number of vernal pools that would need to be surveyed) included a value of 1%, or 0.01 due to roundup, for b (the probability of failing to find the species if it is present within the area). This value assumes that there is a 99% chance of finding the species if it occurs within the area. It was also assumed that *Branchinecta conservatio* is randomly distributed in approximately 1% of the vernal pools in the Central Valley (based on data collected by Helm). Solving for x indicates that 458 vernal pools (or approximately 26 vernal pools per each of the 18 watershed subbasins) would need to be surveyed within the area to provide this type of confidence.

EIP Associates is requesting verbal and written authorization to begin implementing the above protocol as is required under the provisions of our scientific take permit (No. PRT-795938). If you determine that the proposed protocol is consistent with USFWS direction please send a letter of concurrence indicating your authorization.

Thank you for your assistance with the UCCP project. Please do not hesitate to contact me at (916) 325-4800 if you have questions or require additional information.

Sincerely,

Michael Bumgardner
Director of Biological Services

Attachments
P:\MBUMGARD\UCMERCED\MEMOS\LETR0119.WPD

bcc: Trudis Heinecke

January 22, 1999

Mr. Chris Davis
San Joaquin Valley Endangered Species Branch
United States Fish and Wildlife Service
3310 El Camino, Suite 130
Sacramento, CA 95821-6340

SUBJECT: Addendum To the January 19, 1999 Letter Requesting Authorization For Representative Wet Season Sampling Surveys For Federally-listed Vernal Pool Crustaceans within the UCCP Area.

Dear Mr. Davis:

The following letter is an addendum to the letter, dated January 19, 1999, sent to your office requesting authorization for representative wet season sampling surveys for federally-listed vernal pool crustaceans within the UCCP area. Under this addendum, EIP Associates (EIP) proposes to also conduct wet season sampling surveys for federally-listed vernal pool crustaceans within watershed subbasins within the University Community Concept Plan (UCCP) area that are not expected to be directly impacted.

Pursuant to recent meetings with the UCCP core group, the University of California and Merced County have recognized the utility of obtaining information on the distribution of federally-listed vernal pool crustaceans within all portions of the UCCP area. The number of watershed subbasins that would be surveyed is therefore expected to increase by approximately 10 and include all the subbasins within the UCCP area that contain natural vegetation communities and where a substantial amount of the basin is within the UCCP boundary (Figure 1). The total number of additional vernal pools that would be surveyed is expected to total approximately 220 pools and assumes that up to 22 vernal pools per additional watershed would be sampled. The total number of vernal pools that would be surveyed as part of EIP's 1999 wet season sampling protocol would therefore approach approximately 680 vernal pools.

The following watershed subbasins would be added; BR2, BR5, BR6, LG14, MC2, MC3, MC5, MC6, MC7, and FC10. Watershed subbasin BR8 would not be surveyed because it is located within the area of inundation associated with Haystack Reservoir. Watershed subbasins LG10, LG11, LG12 and LG15 would not be surveyed since they are located within the Merced Hills Golf Course or contain only non-native grassland with no vernal pool resources.

Except for the changes outlined above, EIP would follow the survey protocol outlined in the January 19, 1999 letter as it was proposed. EIP Associates is therefore requesting verbal and written authorization to implement this amended protocol. If you determine that the

proposed amended protocol is consistent with USFWS direction please send a letter of concurrence indicating your authorization.

Thank you for your assistance with the UCCP project. Please contact me at (916) 325-4800 if you have questions or require additional information.

Sincerely,

Michael Bumgardner
Director of Biological Services

Attachments
P:\MBUMGARD\UCMERCED\MEMOS\LETR0122.WPD

EXHIBIT 2

CORRESPONDENCE FROM U.S. FISH AND WILDLIFE SERVICE TO EIP ASSOCIATES

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

IN REPLY REFER TO:
1-1-99-PR-0926

March 24, 1999

Mr. Michael Bumgardner
EIP Associates
1200 Second Street, Suite 200
Sacramento, California 95814

Subject: Authorization to Conduct Wet-season Vernal Pool Branchiopod Surveys in the Proposed U.C. Merced Campus Planning Area, Merced County, California (PRT-795938)

Dear Mr. Bumgardner:

This letter verifies the U.S. Fish and Wildlife Service's (Service) verbal approval on January 20, 1999, of your January 19, 1999, request, as amended on January 22, 1999, to commence a wet-season survey for federally listed vernal pool branchiopods within the proposed University of California Merced campus planning area (Project). The Project is located on the Virginia Smith and Cyril Smith Trust properties, northeast of Merced in Merced County, California. You are authorized, under Service permit 795938 and this letter, to determine the presence of federally listed vernal pool branchiopods within the Project area. The wet-season survey shall be conducted during the wet season and in accordance with the protocols specified in the April 19, 1996, *Interim Guidelines to Permittees Under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* (Guidelines) and the following conditions:

1. Only Service-approved biologists listed on permit PRT-795938, or other personnel working under their direct supervision, may conduct surveys for the federally-listed vernal pool branchiopods in the Project area, Merced County, California.

2. The permittee shall notify the Service within 10 working days by letter or telephone if any new locality, or if any new information regarding the range, distribution, ecology, or other pertinent life history data of any of the federally-endangered or threatened species, State-listed species, and rare or sensitive species is obtained during the course of the permittee's authorized activities under this permit. This information also shall be submitted to the California Department of Fish and Game (CDFG), using completed California Native Species Field Survey Forms or their equivalent, no more than 90 calendar days after completing the last field visit of the season at each project site. Each form shall have an accompanying scale map of the site (such as a photocopy of a portion of the appropriate 7.5 minute U.S. Geological Survey map) and shall provide at least the following information for a single species: township, range, and quarter section; name of the 7.5 minute or 15 minute quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) for each species encountered by the permittee; and a description of the habitat by community-vegetation type.

Please note that all information obtained during activities conducted under the authority of this permit is required to be submitted to the Service and the CDFG to remain in compliance with section 10(a)(1)(A) permit Terms and Conditions. Failure to report, or disclose upon request by the Service and/or the CDFG, any information obtained during activities conducted under the authority of this permit could result in the revocation, suspension, or non-renewal of this permit. Please contact the Service at the letterhead address for reporting new locality or new life history data. The CDFG contact is listed below:

Natural Diversity Data Base
California Department of Fish and Game - NHD
1416 9th Street, 12th Floor
Sacramento, California 95814
Telephone: 916/324-3812

4. Any changes to the above specified survey methods, personnel, or areas to be surveyed will require the permittee to request and receive written approval from the Service before any such surveys commence.

Due to the late onset of winter rains this year, your request was verbally approved in time to permit your surveys to begin within two weeks after pools were initially inundated. Therefore, providing you meet the conditions of your permit and this letter, your survey will comprise one full wet-season survey. Please contact Chris Davis or Peter Cross of my staff at (916) 979-2728 if you have any questions concerning this authorization.

Sincerely,

Robert i. Pine for

Cay C. Goude
Acting Field Supervisor

cc: PARD (ES), Portland, OR (Attn: Linda Belluomini)
CDFG, Fresno, CA (Attn: Jeff Single)

EXHIBIT 3

FEDERAL SCIENTIFIC TAKE PERMIT NO. TE795938-2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE. 11th Avenue
Portland, Oregon 97232-4181

IN REPLY REFER TO:

MAY 24 1999

Dear Permittee:

Enclosed is your permit issued under section 10(a)(1)(A) of the Endangered Species Act, 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 Terms and Conditions attached to your permit.

If you have any questions regarding this matter, please contact Linda Belluomini at (503) 231-2063.

Sincerely,

Vicki M. Finn

Vicki M. Finn
Chief - Endangered Species

Enclosures

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-20
(1/97)

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

EIP ASSOCIATES
1200 SECOND STREET, SUITE 400
SACRAMENTO, CA 95814

2. AUTHORITY-STATUTES
16 USC 1539(A)
16 USC 1533(D)

REGULATIONS *(Attached)*
50 CFR 17.22
50 CFR 17.32

3. NUMBER
TE795938-2 AMENDMENT

4. RENEWABLE
[X] YES
[ ] NO

5. MAY COPY
[X] YES
[ ] NO

6. EFFECTIVE
05/24/1999

7. EXPIRES
05/23/2003

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
WILLIAM S. ZIEBRON
PRESIDENT

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.

[X] ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
ANNUAL REPORTS DUE: 1/31
See permit conditions for further requirements.

ISSUED BY

TITLE
CHIEF - ENDANGERED SPECIES

DATE
05/24/1999

SPECIAL TERMS AND CONDITIONS FOR
EIP Associates

1. You were previously issued this permit on June 2, 1997. 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 species), and 50 CFR 17.32 (threatened species), as applicable (copies attached). In addition, the permittee must have any other applicable State and Federal permits prior to the commencement of activities authorized by this permit.

3. Authorized to take (harass by survey, collect and sacrifice) the Conservancy fairy shrimp (*Branchinecta conservatio*), longhorn fairy shrimp (*Branchinecta longiantenna*), Riverside fairy shrimp (*Streptocephalus woottoni*), San Diego fairy shrimp (*Branchinecta sandiegonensis*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*) in conjunction with surveys for the purpose of enhancing their survival as specified in the permittee's November 25, 1997, and November 27, 1998, amendment and renewal request and supplementary information provided on December 18, 1998, in accordance with the conditions stated below.

4. Permitted activities are restricted to the following geographic areas in California:

   Throughout the species range.

   Proposals to conduct sampling activities pursuant to this permit at specific locations within the above referenced area shall be submitted in writing to the appropriate Fish and Wildlife Office (FWO) of the U.S. Fish and Wildlife Service at least 10 days prior to conducting such activities. The appropriate FWO is determined as follows:

   > In California 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: 916-979-2725; fax: 916-979-2723). For areas from Santa Cruz County south to Los Angeles County north of the Angeles National Forest, contact the Ventura Fish and Wildlife Office, 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), 2730 Loker Avenue West, Carlsbad, California 92008 (telephone: 760-431-9440; fax: 760-431-9618).

The sampling proposals shall include: (1) 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; (2) the number of vernal pools proposed to be surveyed or number of acres proposed to be surveyed; (3) the number of individuals proposed to be captured and/or collected; (4) the name of the individual who will be completing the soil processing and/or preliminary vernal pool branchiopod cyst identification; and (5) a map (at a minimum, a 1:24,000 scale U.S. Geological Survey (USGS) topographical map) depicting the location of the survey site(s).

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 Chief-Endangered Species at the Services's Portland Regional Office (PRO), 911 N.E. 11th Avenue, Portland, Oregon 97232-4181, 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 U. S. Fish and Wildlife Service (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 amend this permit a complete amendment application must be submitted to the PRO.

6. Taking of the Conservancy fairy shrimp, longhorn fairy shrimp, Riverside fairy shrimp, San Diego fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp (hereafter collectively referred to as vernal pool branchiopods):

This permit authorizes the sampling and collection of 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 should not exceed a ratio of 1 liter per each $10m^2$ (approximately 1% at 1cm deep) of estimated vernal pool surface area surveyed.

e. The permittee shall provide the appropriate FWO with a report containing all of the survey information specified in the Guidelines no more than 90 calendar days after completing the last field visit of the season at each project site. Use the appropriate Vernal Pool Data Sheet, where applicable, as the reporting form.

7. The number of individuals allowed to be incidentally injured or killed during permitted activities is 10 individuals of each vernal pool branchiopod (and an unquantifiable number of eggs) in any calendar year.

   a. Any incidental injury or killing must be reported within 3 working days to the PRO 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 PRO, which may, after analysis of the circumstances of mortality or injury, revoke or amend this permit.

      ii. Immediately notify the PRO (telephone: 503-231-2063; fax: 503-231-6243) 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. The incident shall also be discussed in the annual report that is subsequently submitted.
      A copy of this report shall also be sent to the California Department of Fish and Game (CDFG), Wildlife Management Division, 1416 Ninth Street, Sacramento, California 95814 (telephone: 916-654-4260).

   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 will 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.

8. Designated depositories:

   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.

9. California Natural Diversity Database forms shall be completed, as appropriate, for each listed species addressed herein and submitted to the Natural Diversity Data Base, CDFG - NHD, 1416 Ninth Street, 12th Floor, Sacramento, California 95814, with copies submitted to the appropriate FWO. Each form sent to the CDFG shall have an accompanying 1:24,000 scale USGS map of the site (or an exact scale photocopy of the appropriate portion(s) of the map). Copies of the form can be obtained from the CDFG at the above address (telephone: 916-324-3812).

   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.

10. Annual reports of activities shall be submitted to the SFWO and any other appropriate FWO by January 31, of each year this permit is in effect. The report shall be in the following format: (a) an introduction section addressing reasons and objectives for taking the species; (b) a methodology section addressing data collection and analysis procedures; (c) a results section that provides the data collected, including any information on any other federally listed species detected while conducting activities authorized under this permit; and (d) a conclusion section that specifically provides recommendations for recovery of the species. If no activities took place over the course of a year, indication of such shall be submitted as an annual report.

    The 90-day reports prepared in accordance with the Guidelines (without attachments) may be submitted as the annual report, and any recovery recommendations can be attached.

5/24/99
Date

Sarah B. Hall
Chief, Endangered Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE. 11th Avenue
Portland, Oregon 97232-4181

IN REPLY REFER TO:

LIST OF AUTHORIZED INDIVIDUALS
For TE-795938-2

1. Individuals authorized to conduct activities pursuant to this permit:

   Ronald Walker, Sam Garcia, Mark Gernaris, Randy Zebell, and Leonora Ellis.

   Other persons may conduct activities pursuant to this permit only under the direct, on-site supervision of the above named individuals.

5/24/09
Date

for Sarah B. Hall
Chief, Endangered Species

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

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE. 11th Avenue
Portland, Oregon 97232-4181

Implemented September 1994

GENERAL CONDITIONS FOR NATIVE ENDANGERED AND THREATENED WILDLIFE SPECIES PERMITS

1. All sections of Title 50 Code of Federal Regulations Part 13 are conditions of the permit.

2. All applicable foreign, State, local, or other Federal laws, including trespass laws, and other laws requiring permits, must be observed.

3. The permittee must carry a copy of the permit while conducting authorized activities.

4. The permit number must be legibly printed on all documents and advertisements involving activities conducted under a permit.

5. Unless otherwise authorized on the face of the permit, the wildlife must be immediately released at or near the capture site after the permitted activity.

6. Living specimens must be handled and shipped so as to minimize risk of injury, damage to health or cruel treatment.

7. The container in which authorized wildlife is shipped must be plainly marked with names and addresses of shipper and consignee and an accurate description of the contents including common and scientific name and number of each within.

8. Any dead or injured specimens of the authorized wildlife found may be salvaged or cared for.

9. BIRD BANDING, marking, radio tagging, etc., must be conducted in accordance with a Federal Bird Marking and Salvage Permit.

10. At the discretion of the Service, a Service employee may inspect the facilities or accompany the permittee during any activity conducted pursuant to this permit. The permittee shall allow Service personnel complete and immediate access to any materials and information generated as a result of this permit. Any refusal, obstruction, or hindrance of Service participation in such work shall be grounds for suspension or revocation of this permit in accordance with 50 CFR 13.27 or 50 CFR 13.28, respectively.

THE FOLLOWING CONDITIONS APPLY UNTIL AUTHORIZED DISPOSAL OF THE WILDLIFE (LIVE OR DEAD), AND THEIR PROGENY, REGARDLESS OF THE EXPIRATION DATE OF THE PERMIT:

11. The authorized wildlife may NOT be sold, donated, or transferred without written authorization from the Service.

12. Any dead authorized wildlife shall be preserved according to standard museum practices and held for scientific purposes whenever practical.

13. Any live SEA TURTLES held must be maintained in accordance with the "Standards for Care and Maintenance of Sea Turtles Held in Captivity" specified by the Service.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

April 19, 1996

IN REPLY REFER TO:

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

The endangered Conservancy fairy shrimp (*Branchinecta conservatio*), longhorn fairy shrimp (*Branchinecta longiantenna*), vernal pool tadpole shrimp (*Lepidurus packardi*), and the threatened vernal pool fairy shrimp (*Branchinecta lynchi*) were listed on September 19, 1994, under the Endangered Species Act of 1973, as amended (Act) (59 Federal Register 48136). These species are endemic to vernal pools in the Central Valley, coast ranges, and a limited number of sites in the Transverse Range and Riverside County, California. The endangered Riverside fairy shrimp (*Streptocephalus woottoni*) was listed under the Act on August 3, 1993 (58 Federal Register 41391). This species inhabits Riverside, Orange and San Diego Counties, California, and northern Baja California, Mexico. These five species, hereafter referred to as vernal pool branchiopods, are fully protected under the Act. The San Diego fairy shrimp (*Branchinecta sandiegonensis*) is a proposed endangered species. Surveys for all these species should follow the methodologies described in these Interim Survey Guidelines (Guidelines). It is expected that the Guidelines will be revised in the future as additional information becomes available.

These Guidelines are issued as guidance to section 10(a)(1)(A) permittees. Because taking (killing, injuring, harming or harassing) endangered species is strictly prohibited under the Act, a section 10(a)(1)(A) recovery permit must be obtained prior to initiating any surveys or studies that might result in the take of endangered or threatened branchiopods. Failure to obtain this permit may result in violation(s) of section 9 of the Endangered Species Act. Additionally, violation(s) of a section 10(a)(1)(A) permit may result in its non-renewal, suspension or revocation.

For the purposes of these Guidelines, vernal pools and swales are defined as follows:

> Vernal pools and swales are ephemeral wetlands that form in areas of California with Mediterranean climates that have shallow depressions underlain by a substrate of hardpan, clay, or basalt near the surface that restricts the percolation of water. They may be characterized by a barrier to overland flow that causes water to collect and pond. Vernal pools/swales may occur singly, but more typically occur in vernal pool/swale complexes, due to the local hydrology, geology, and topography. Initially, the dry soil in vernal pools/swales becomes wet and starts to saturate during the fall and early winter rains. The second stage in a typical vernal pool cycle is characterized by peak rainfall and inundation of the vernal pools/swales. Vernal pools may remain

inundated until spring or early summer, sometimes filling and emptying numerous times during the wet season. The vernal pools gradually dry down during the spring, quite often forming the unique "bathtub ring" of flowers from endemic vernal pool plants blooming profusely at the pool margins. This drying down stage is typified by the production of seeds in the endemic plants and the dispersal of animals from the vernal pools. These pools eventually dry down totally, with the onset of drought conditions. During this final stage, early season and shallow-rooted plants turn brown, and the soil dries and may crack. With average rainfall patterns, vernal pools are typically characterized by a predominantly annual plant community dominated by wetland species.

Note: At this time, vernal pool-associated activities not directed toward the listed species, such as botanical surveys and wetland delineations, are not considered to require a permit. However, persons conducting such activities should minimize any potential impact on the vernal pool branchiopods or plants by reducing the amount of walking through vernal pools to the lowest extent practical. Persons conducting projects that require permits (e.g., branchiopod or amphibian surveys) should also minimize walking through the pools.

I. Survey Approval

Unless otherwise authorized by the U.S. Fish and Wildlife Service (Service) in writing, these Guidelines shall be utilized for all surveys conducted for the listed vernal pool branchiopods. Any deviations from the methods prescribed by these Guidelines must be approved by the Service before surveys are conducted. The permittee shall provide the appropriate Service Field Office (see XI, Service Contact section) with all of the following information in writing for each project site at least 10 working days prior to the anticipated start date of survey work:

a. The precise location of the project site clearly delineated on either an original or high quality copy of a U.S. Geological Survey topographic map (exact scale, 7.5 minute, 1"=2,000 ft.). The map should contain the project name, type of project by category [the categories are: development, mitigation banking, or other (specify)], the estimated area (acreage) of the project site and an estimated number or area (acreage) of pool/swales on the site, quad name, and county name;

b. Names of all vernal pool biologists and associated personnel with reference to their section 10(a)(1)(A) permit number; and

c. A written request to commence wet season or dry season sampling for each project to be surveyed for the listed vernal pool branchiopods.

II. Sampling Survey Completion

a. Once initiated, surveys conducted pursuant to these Guidelines may be suspended prior to completion if:

1. the presence of one or more of the five listed branchiopods on the subject site is determined through identification at any point within the wet season survey cycle; or

2. it is agreed that one or more of the listed vernal pool branchiopods are present on the subject site.

b. Permission to dry season survey for the listed vernal pool branchiopods requires the completion of both the full wet season survey and the dry season survey, including the complete analysis of all dry soil samples (see V).

c. A complete survey consists of sampling for either:

1. two full wet season surveys done within a 5-year period; or

2. two consecutive seasons of one full wet season survey and one dry season survey (or one dry season survey and one full wet season survey).

d. Each vernal pool/swale in a vernal pool/swale complex shall be surveyed as per these Guidelines. However, in the case of a large vernal pool/swale complex, the Service may authorize a representative portion or portions of the vernal pool/swale complex to be surveyed as per these Guidelines.

III. Notification of Presence

Should the permittee determine that any of the five listed vernal pool branchiopods are present at a site, the appropriate Service Field Office (see XI, Service Contact section) shall be notified within 10 working days by letter or telephone.

IV. Wet Season Surveys

Wet season survey sampling shall not be conducted at any project site unless the permittee receives prior permission from the Service (see I (c)).

a. Survey Initiation, Frequency, and Termination

1. Surveyors should visit sites after initial storm events to determine when

pools/swales have been inundated. A pool/swale is considered to be inundated when it holds greater than 3 cm of standing water 24 hours after a rain event.

2. Pools/swales shall be adequately sampled once every two weeks, beginning no later than two weeks after their initial inundation and continuing until they are no longer inundated, or until they have experienced 120 days of continuous inundation.

3. In cases where the pools/swales dry and then refill in the same wet season, sampling shall be reinitiated within eight days of refilling every time they meet the 3 cm of standing water criteria and shall continue until they have experienced 120 days of continuous inundation, or until they are no longer inundated.

4. If a vernal pool/swale has already experienced 120 days of continuous inundation, but then dries down and subsequently refills in the same wet season, surveys must be re-initiated in accordance with IV(a)(3) above, each time the vernal pool/swale refills and meets the 3 cm of standing water criteria.

5. Once initiated, surveys conducted pursuant to these Guidelines may be suspended prior to completion if the presence of one or more of the five listed branchiopods on the subject site is determined through identification at any point within the wet season survey cycle

b. Survey Sampling

At each wet season visit, representative portions of the pool/swale bottom, edges, and vertical water column shall be adequately sampled using a seine, dip net or aquarium net appropriate for the size of the pool or swale. Net mesh size shall not be larger than (1/8) inch. Seines shall be examined and emptied of material at least once every five linear meters.

c. Voucher Specimens

1. Voucher specimens shall be collected only once for each individual vernal pool/swale and shall be accessioned to either the California Academy of Sciences (CAS) or the Natural History Museum of Los Angeles County (LACM) (see VIII).

2. Voucher specimens of all listed vernal pool branchiopods captured shall be collected and all other specimens shall be returned in good condition to the vernal pool/swale where they were found as quickly as possible.

3. No more than 20 specimens of each species of listed vernal pool branchiopods from each pool/swale, or less than 10% of the subpopulation present in the pool/swale, whichever is the lesser amount, shall be retained and preserved as voucher specimens.

4. Only sexually mature, adult branchiopods shall be used for purposes of voucher specimens for species identification. The Service will not accept species identifications made using immature specimens.

5. The sample of 20 voucher specimens shall include no less than three specimens of either sex.

V. Dry Season Surveys

Dry season soil sampling shall not be conducted at any project site unless the permittee receives prior written permission from the Service (see I (c)).

a. Soil Collection

Soil shall be collected when it is dry to avoid damaging or destroying cysts which are more fragile when wet. A hand trowel or similar instrument shall be used to collect approximately one liter volume sample per pool/swale of the top 1-3 cm of pool sediment. Whenever possible, soil samples shall be collected in chunks. The trowel shall be used to pry up intact chunks of sediment, rather than loosening the soil by raking and shoveling which can damage cysts.

In southern California there are a number of federally listed plant species (*Orcuttia californica, Pogogyne abramsii,* and *Pogogyne nudiscula*) that often co-occur with the fairy shrimp. Removal of soil could damage populations of these plants by inadvertently removing seed. Dry sampling should be minimized or avoided within those vernal pools/swales that are known to, or may, contain these species. The permittee shall contact the Carlsbad Field Office (see XI, Service Contact section) regarding the distribution of these listed plants species prior to conducting dry sampling in Los Angeles, Orange, Riverside and other southern California counties.

b. Soil Sample Volume

Each soil sample from the 10 soil sample locations shall be labeled, stored, and analyzed individually.

1. A total of 10 soil samples of approximately 100 ml each shall be taken from each pool/swale, for a total soil sample volume of approximately one liter per pool/swale.

2 In the case of a very large playa, dry lake, or vernal pool, the Service may authorize the removal of more than one liter of soil.

3. If a pool has a diameter of less than three meters, the total soil sample taken shall not exceed ½ liter in volume per pool, and the 10 soil samples shall be approximately 50 ml each in volume.

c. Soil Sample Locations

A total of 10 soil samples shall be collected from the following locations within each pool/swale sampled:

1. Starting with one soil sample taken from the edge of the pool/swale, at least four soil samples shall be taken from equidistant points along the longest transect of the pool/swale.

2. Starting with one soil sample taken from the edge of the pool/swale, at least four soil samples shall be taken from equidistant points along the widest transect of the pool/swale.

3. If neither the longest or the widest transect encompasses the deepest part (or parts) of the pool/swale, then at least two soil samples shall be taken from the deepest part (or parts) of the pool/swale..

d. Soil Storage

1. The soil samples from each soil sample location shall be stored in separate bags, labeled with the specific location within the pool/swale from where each soil sample was taken. A sketch of the pool/swale showing the specific location of each soil sample shall be included in the 90-day report.

2. Soil samples containing any residual moisture initially shall be adequately ventilated and allowed to air dry thoroughly before storage of the sample. The bags containing the soil samples shall be kept out of direct sunlight in order to avoid excessively heating the sample.

3. All soil samples shall be retained and stored as directed in V(d)(1) and V(d)(2) above until the Service is able to provide direction in species-level identification of the cysts of all the aforementioned branchiopod species.

e. Soil Sieving

1. The soil samples shall not be ground, crushed, or otherwise manipulated in order to expedite the sieving process. A relatively short period of pre-soaking the soil sample may be helpful/necessary in order to facilitate the sieving process. Small aliquots (approximately 50 ml in volume) of soil shall be gently washed with water through a graded series of U.S. standard eight inch soil sieves ending in mesh sizes 300 micron (um), and 150 micron (um).

2. Sieves must be thoroughly rinsed and visually inspected for any cysts adhered to the sieves prior to the start of sieving. This process must be repeated for each individual soil sample location. Sieves shall also be rinsed and thoroughly inspected upon completion of sieving soil samples.

f. Soil Examination

1. Washed and sieved soil fractions from the 300 um and 150 um sieves shall be examined under a dissecting microscope for tadpole shrimp and fairy shrimp cysts. The process shall be repeated until all individual soil samples have been examined. All sieved material shall be processed and dried as quickly as possible, preferably within one hour from the initial wetting.

   Note: Do not return soil to survey sampling site.

2. All fairy shrimp and tadpole shrimp cysts shall be removed from the soil, separated by cyst type into labeled vials, allowed to air-dry, and then stored dry.

g. Cyst Density

Cyst density information for each soil sample location shall be calculated by dividing the total number of cysts recovered by the total amount of soil from the individual aliquots from that soil sample location. Total cyst density information for each soil sample location shall be reported for each species in terms of: none; 1-25 cysts/100 ml soil; 26-50 cysts/100 ml soil; 51-100 cysts/100 ml soil; 101-199 cysts/100 ml soil; or more than 200 cysts/100 ml soil.

h. Cyst Identification

Each fairy shrimp and tadpole shrimp cyst type shall be identified to genus by a

qualified biologist. The Service may require an independent review by a crustacean biologist(s) of any vernal pool branchiopod or cyst identification.

There are two options when a branchiopod cyst identification is made to genus:

1. the survey, pursuant to these Guidelines, may be suspended if it is agreed one or more of the listed species are present on the project site; or

2. one subsequent complete wet season sampling survey shall be conducted to complete survey requirements.

VI. Cyst Voucher Specimens

A representative sample of each cyst type from each pool/swale shall be accessioned to either CAS or LACM (see VIII).

VII. 90-Day Reports

a. U.S. Fish & Wildlife Service

The permittee shall provide the appropriate Service Field Office (listed in the Service Contact section) with all of the following information in writing, using the appropriate Vernal Pool Data Sheet where applicable as the reporting form, no more than 90 calendar days after completing the last field visit of the season at each project site:

1. The location of the project site clearly delineated on an original or high quality copy of a U.S. Geological Survey topographic map (exact scale, 7.5 minute, 1"=2,000 ft.). The location of the listed vernal pool branchiopods is to be included on the 7.5 minute maps in as precise a manner as possible (e.g., lat/long or location within a section).

2. Five color photographic 35mm slides and/or 3" x 5" photographs of each project site taken during sampling in the wet season; this is to include two slides and/or photographs taken from standing position that portray the general landscape of the site [i.e., two photos from an opposing axis of the site (e.g., north and south compass headings)]; and three slides and/or photographs of representative vernal pools, swales, and other areas within the site sampled for the five listed vernal pool branchiopod species. The following information shall be legibly written on each slide/photograph with permanent ink: precise location of the project site, direction from which photograph was taken, date of photograph, initials of photographer, and initials of the scientific names of any of the five listed vernal

pool branchiopod species that were found at the depicted site.
Note: Slides and/or photographs only need to be submitted once per project site.

3. The estimated number of individuals of any of the listed vernal pool branchiopods observed in each pool/swale shall be reported in terms of an order of magnitude (e.g., 10's, 100's, 1000's).
(Refer to the Vernal Pool Data Sheet)

4. The number of individuals of any of the listed vernal pool branchiopods or cysts preserved from each pool/swale and the name of the institution in which they are accessioned.
(Refer to the Vernal Pool Data Sheet)

5. A qualitative description of the vernal pool/swale community. A general list of amphibian species and non-listed vernal pool crustacean species (by common and/or scientific name) encountered at the project site is desirable. For purposes of this permit a full survey for these species is not required. However, if more detailed information is collected, it shall be included in the Vernal Pool Data Sheet.
(Refer to the Vernal Pool Data Sheet)

6. Data collected during each field visit, including: date, air temperature, water temperature, weather conditions (e.g., sunny, overcast), maximum depth of each pool/swale, and size (area in square meters) of each pool/swale.
(Refer to the Vernal Pool Data Sheet).

7. (Optional) water chemistry data collected during each field visit, including: alkalinity (total: ppm or mg/l), conductivity (uMHO), dissolved oxygen (ppm or mg/l), dissolved NH_4 (ppm or mg/l), pH, salinity (ppt), total dissolved solids (TDS, ppm), and turbidity.
(Refer to the Vernal Pool Data Sheet)

b. California Department of Fish & Game

1. Permittees should consult with the California Department of Fish and Game (916/653-4875) to determine their responsibilities under the California Endangered Species Act and the California Fish and Game Code.

2. The permittee shall supply the California Department of Fish and Game (Natural

Diversity Data Base, Staff Zoologist, California Department of Fish and Game, 1416 9th Street, Sacramento, California 95814; telephone 916/322-2494) with completed California Native Species Field Survey Forms, no more than 90 calendar days after completing the last field visit of the season at each project site.

VIII. Accessioning Voucher Specimens

a. All vernal pool branchiopod voucher specimens (including individuals collected and cysts) shall be accessioned into either the California Academy of Sciences (CAS) or the Natural History Museum of Los Angeles County (LACM). All specimens shall be preserved according to the accession standards of the repository which will accession and maintain the specimens. The October 1995 CAS and September 1995 LACM standards are attached to these Interim Survey Guidelines.

b. All vernal pool branchiopod voucher specimens (including individuals collected and cysts), along with a copy of the Vernal Pool Data Sheet containing all of the items listed in VII (a), shall be permanently deposited in the CAS or LACM within 90 calendar days of the completion of the field survey and the Service shall be supplied with the CAS or LACM catalog numbers given to the specimens.

c. The permittee shall supply the CAS or LACM with a photocopy of their section 10(a)(1)(A) permit to validate that the specimens supplied to them were taken pursuant to a permit. The Service will likely consider refusal by the CAS or LACM to accession any listed branchiopod specimens to be a violation by the permittee of their section 10(a)(1)(A) permit (e.g., if due to improper preservation/storage).

California Academy of Sciences (CAS)
Department of Invertebrate Zoology and Geology, Golden Gate Park,
San Francisco, California 94118; telephone (415) 750-7082

Natural History Museum of Los Angeles County (LACM)
Crustacea Section, Invertebrate Zoology, 900 Exposition Boulevard,
Los Angeles, California 90007; telephone (213) 744-3450

IX. Additional information, limitations, and caveats with respect to these Guidelines are as follows:

a. From time to time, specific circumstances may justify or necessitate revision of these Guidelines, on a case-by-case basis. At the discretion of the Service, such a variance may be allowable under these Guidelines if:

1. the permittee explains to the Service in writing why the variance to the Guidelines is needed and justified; and

2. the Service concurs, in writing, with the variance requested by the permittee.

b. The Service reserves the right to reject vernal pool branchiopod surveys conducted under these protocols as inadequate if:

1. survey methods used are inconsistent with these Guidelines, unless prior written permission (see I, Survey Approval) has been obtained; or

2. other information indicates that the survey is inadequate as determined by the Service.

X. Permit Infractions

The Service may consider any of these actions to be a violation by the permittee of their section 10(a)(1)(A) permit:

a. falsification of any reporting or information;

b. failure to follow the stated Guidelines sampling methodologies;

c. failure to obtain prior permission to commence wet season surveys or failure to obtain written permission to commence dry season surveys (see section I (c));

d. failure to notify the Service within 10 days of a determination of presence of one or more of the listed vernal pool branchiopods on a survey site;

e. failure to accession voucher specimens or improperly accessioned voucher specimens;

f. failure to file completed 90-day reports with the Service within 90 calendar days after completing the last field visit of the season at each project site; or

g. failure to file completed Natural Diversity Data Base forms with the California Department of Fish and Game within 90 calendar days after completing the last field visit of the season at each project site.

Violation(s) of a section 10(a)(1)(A) permit may result in its non-renewal, suspension or revocation.

XI. Service Contact

For the Central Valley hydrographic basin and the coast ranges north of the Santa Cruz County line, the Sacramento Field Office (2800 Cottage Way Room E-1803, Sacramento, California 95825; telephone 916/979-2728) should be contacted regarding vernal pool branchiopod issues.

For areas from Santa Cruz County south to Ventura County, contact the Ventura Field Office (2493 Portola Road - Suite B, Ventura, California 93003; telephone 805/644-1766).

For areas from Los Angeles County south to the U.S.- Mexico border, contact the Carlsbad Field Office (2730 Loker Avenue West, Carlsbad, California 92008; telephone 619/431-9440).

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: ____/____/____ Time: _____ County: _____ Quad: _____

Collector(s): _____ Permit #: _____

Site/Project Name: _____ Pool #: _____

Township: _____ Range: _____ Section: _____ _____lat._____long.

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

Pool Depth:
at time of sampling: _____cm
estimated maximum: _____cm

Surface Area:
at time of sampling: _____m x _____m
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 NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

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

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:

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

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

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

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

(Optional) Species Observations:

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

Insects: (adult or larvae)

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

Voucher Specimens

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

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Dry 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: ___/___/___ Time: _____ County: _____ Quad: _____

Collector(s): _____ Permit #: _____

Site/Project Name: _____ Pool #: _____

Township: _____ Range: _____ Section: _____ _____lat. _____ long.

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:

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (estimated maximum) Surface Area: _____m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

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

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

Collection, Preservation, Handling, and Accessioning Information for Small Crustaceans

Crustacea Section, Invertebrate Zoology
The Natural History Museum of Los Angeles County
900 Exposition Boulevard
Los Angeles, California 90007

Collection Data

To the extent possible, the following data should be included. The Museum reserves the right to refuse acceptance of any specimens without a minimum of usable, legible collection data. Archival quality materials (including glass vials, permanent ink or pencil and permanent label paper, and glass outer jars with screw-top polypropylene lids) should always be used (see below). All collections should include the following information:

Taxon name: (Lowest available or known, down to species where possible)
Date: (day, month, year)
Time of Day: (if known)
Detailed Location:
Latitude and Longitude:
Specific habitat information:
Name of collector:
Collecting method(s) / device(s):
Preservative used:
Notes: (to include any observations on behavior, co-occuring species, etc.)

Preservation

Ideally, even small crustaceans should be initially fixed in 5 to 10% formalin (37% formaledhyde in solution, as commercially purchased, mixed with 90-95% water). As an alternative, 100% ethyl alcohol, although not a fixative and so not as good for long term tissue preservation, can sometimes be used (not recommended for animals longer than 20 mm total length). With either method, specimens should be transferred to 70% ethyl alcohol (ethanol) after a minimum of 8 hours of fixation. The 70% ethanol to tissue ratio should be approximately 3 to 1 for long term storage.

Storage

Archival quality materials (including glass vials, permanent ink or pencil and permanent label paper, and glass outer jars with screw-top polypropylene lids) should always be used. Specimens should be placed in small glass vials completely filled with 70% ethanol and plugged with cotton (not foam). Vials are then inverted and stored in a slightly larger outer storage jar of glass or plastic, also filled with 70% ethanol and fitted with a polypropylene-closure lid. Labels are ideally situated in the outer jar containing the vial rather than in the shell vial, never on the outside of the jar or affixed to the lid.

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Collecting method(s) / device(s):
Preservative used:
Notes: (to include any observations on behavior, co-occuring species, etc.)

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Shipping

Specimens should be shipped in plastic, leak-proof bottles, jars, or vials, and must be adequately cushioned by bubble-wrap, plastic peanuts, etc. to ensure their safe arrival. It is preferred that specimens that are designated types or vouchers be sent by registered or certified mail, although this is at the discretion of the sender. Use the complete address given at the top of this document.

Cost of Specimen Accessioning

Because of the rising costs of accessioning and maintaining valuable collections, the Natural History Museum reserves the right to charge on a per-sample basis for accessioning collections. This fee varies with the size of the collection, duration of the project, and availability of Museum staff at the time of deposition. The fee may be waived at the discretion of the Curator or Collections Manager of Crustacea and may fluctuate depending upon our evaluation of lots received.

Accessioning Information

The Natural History Museum of Los Angeles County will accept for permanent care and curation selected collections of Crustacea, including those from vernal pools and other ephemeral freshwater habitats and representatives of threatened or endangered taxa. The Museum is willing to act as the repository for collections acquired during USFWS or other surveys.

To be accepted for accessioning, the collections must be in reasonably good shape, meaning that the animals themselves must not be overly deteriorated and that all previously stated collecting, preserving, and labeling protocols have been followed. Furthermore, all collections must be accompanied by a detailed list of the specimens being sent.

The Museum reserves the right to charge an accessioning fee to cover the costs of accessioning any and all deposited specimens. This fee may be waived at the discretion of the curator in charge of the Museum Section that will be overseeing the accessioning and curation of the collection.

The Museum reserves the right to decide whether an incoming collection should be stored topically vs. separated and stored according to taxonomic divisions (i.e. storing all members of one family together rather than keeping all collections from one site together).

The Museum further reserves the right to decide which specimens will be kept and maitained for long term storage and which may be passed on to other institutions in exchange or as long term loans for research purposes.

For further information contact:

Dr. Gary Pettit, Collections Manager, Crustacea 213-744-3450 fax 746-2999
Dr. Joel W. Martin, Curator of Crustacea 213-744-3440 fax as above
(Or write to the address given above)

This document current as of: 25 September 1995

California Academy of Sciences
Department of Invertebrate Zoology and Geology
Golden Gate Park
San Francisco, CA 94118

October 1995

Protocols and standards for preservation and archival of vernal pool crustaceans.

Specimens of vernal pool crustaceans listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and collected during surveys permitted by the USFWS may be deposited as voucher specimens at the California Academy of Sciences, Department of Invertebrate Zoology and Geology (CASIZG). However, only those specimens which have been properly fixed, preserved and documented will be accepted for archival. The vendors listed below can supply the necessary materials for specimen storage, however these vendors are not specifically required and materials from other sources will be acceptable provided they meet the standard requirements of CASIZG. Any questions regarding these standards and protocols may be directed to Dr. Robert Van Syoc, Senior Collection Manager of invertebrates at CASIZG (415-750-7082). Visits to the collection to deposit potential voucher specimens must be at least 7 days in advance. Specimens may be shipped to CASIZG, but shipments with damaged specimens or broken containers will not be accepted. Each shipment must be accompanied by a packing list of specimens sent. CASIZG catalog numbers will be assigned by CAS staff and notification sent to you by U. S. mail. This will be done in an expeditious manner, but staffing limitations may cause delays. Therefore, allow several days for notification of CASIZG catalog numbers.

Materials required:

- 100% or 95% non-denatured ethanol
- 75% non-denatured ethanol (diluted from 100% or 95% with de-ionized or distilled water)
- 2 dram, 4 dram, 6 dram glass shell vials
- Clean cotton
- 8 oz. tall flint glass bottles, 48 mm aperture (inside diameter) or 32 oz. glass bottles, 74 mm aperture (inside diameter)
- White polypropylene screw-top closures with solid (no holes) smooth surface, 58 mm diameter (8 oz. bottles) or 85 mm diameter (32 oz. bottles), with foam or plastic liners
- Nalgene polypaper
- Dot-matrix printer and alcohol-proof ink ribbons, or technical pen with alcohol-proof ink, or #2 pencil

Standards and Protocols:

- Vernal pool crustaceans must be fixed in 100-95% non-denatured ethanol and preserved for archival in 75% non-denatured ethanol. Enough 100-95% ethanol should be used in the initial fixation to insure proper fixing of tissues. A ratio of at

least 10 parts 100-95% ethanol to 1 part tissue is required for initial fixation. A ratio of at least 3 parts 75% ethanol to 1 part tissue is required for preservation.

- All specimens must be sorted by collecting event (each locality/date/time of collection). They must be identified to species level, each species from each collecting event placed into a vial or vials in it's own 8 or 32 oz. bottle (use the smaller size if possible).

- Specimens are placed into 2 dram, 4 dram, or 6 dram glass shell vials filled with 75% ethanol. The vial or vials are plugged with clean cotton in such a manner that no air bubbles are trapped inside and placed inverted into an 8 or 32 oz. glass bottle filled with 75% ethanol (Fig. 1). If open vials with specimens are inserted upright into the larger container, then plugged with cotton, air bubbles will not be trapped in the vial. The vial may then be removed and placed back into the bottle with cotton plug down for archival. It is important to remember that the specimens should not be jammed into the vials. The purpose of placing specimens into vials is to protect them from potential damage which could be caused by contact with labels placed into the jar or during removal from the 8 or 32 oz. container. However, putting too many specimens into a vial or putting specimens into a vial which is too small will damage them. The required ratio of preservative to tissue inside the vial is at least 3 parts 75% ethanol to 1 part tissue. This may require splitting a species sample from a single collecting event into two or more vials within a bottle or even into two bottles.

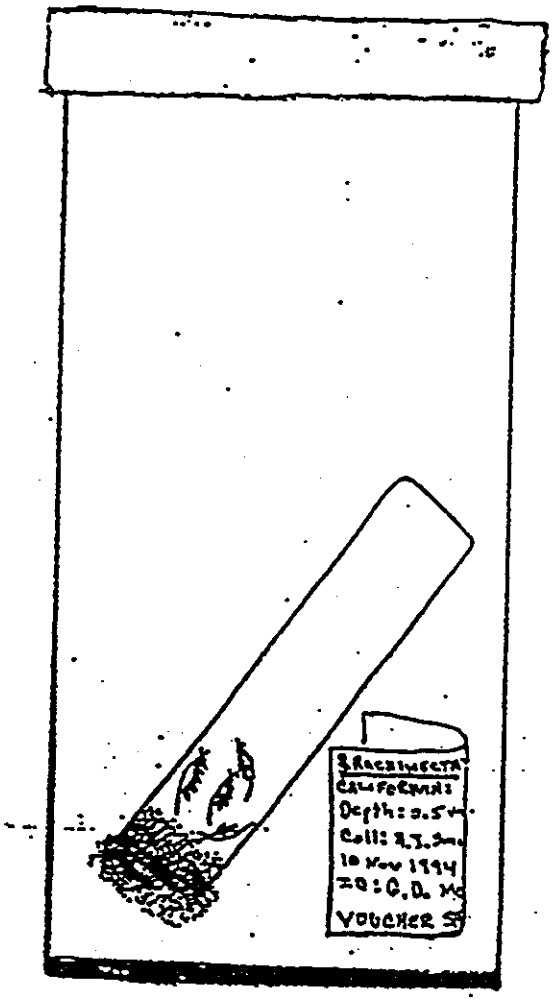
- The 8 or 32 oz. glass bottle is capped with the foam or plastic lined, screw-top polypropylene closure.

- Each 8 or 32 oz. bottle must contain a label with collecting event data on Nalgene polypaper in alcohol-proof ink or #2 pencil. Labels must be placed into the specimen bottle which contains the specimen vial(s), not directly inside the vials and not attached to the outside of the bottle. The data may be printed using a dot-matrix printer with alcohol-proof ink ribbon. Alternatively, it may be hand printed with technical pen using alcohol-proof ink or a #2 pencil. Laser printed or photocopied labels are not acceptable. All labels must be easily readable by CAS staff. If labels are not legible, specimens will not be accepted or cataloged into the CAS collection. Labels should be no larger than 3 x 5 inches and no smaller than 2 x 3 inches.

Data required for specimen labels:

- Species name
- County, city/town, and other clearly worded description of collection locality so as to enable another scientist to find the collection locality
- Latitude and longitude
- Environmental data regarding habitat (temperature, turbidity, depth and size of pool)
- Full names of collector(s) and identifier
- Dates of collection and identification, dates should clearly indicate day, month and year (e.g. 10 Jan 1995)
- The phrase "Voucher specimen: Vernal Pool Crustacean Survey"

Fig. 1: 8 oz. bottle containing inverted glass vial plugged with cotton. Note label inside jar, but not inside vial.



List of potential (not specifically required) vendors of some required materials.

Glass vials: S-930	Acme Vial and Glass 1601 Commerce Way Paso Robles, CA 93446 (805) 239-2666
Glass bottles: and polypropylene lids	California Glass 155 98th Ave. Oakland, CA 94603 (510) 635-7700
Polypropylene lids:	Berlin Packaging 7900 Edgewater Dr. Oakland, CA 94621 (510) 562-7201
Cotton: non-sterile	California Medical Supplies 3315 Broadway Oakland, CA (510) 885-5105
Nalgene Polypaper:	VWR Scientific (415) 468-7150 (800) 932-5000
Alcohol-proof ("non-bleeding") printer ribbons:	Automated Office Products Inc. 9700-A Martin Luther King Jr. Hwy. Lanham, MD 20708
Non-denatured ethanol 190 or 200 proof (95% or 100%)	Gold Shield Chemical 3111 Depot Rd. Hayward, CA 94545 510-782-2040

Materials may be obtained from other sources, but should conform to the specific standards listed above. CASIZG will not act as a supplier of materials.

The California Natural Diversity Data Base
Commonly Asked Questions

What is the Natural Diversity Data Base (NDDB)?

The NDDB is a program within the Department of Fish and Game's Natural Heritage Division. The NDDB's mission is to track the location and condition of California's many species of rare and sensitive plants, animals, and natural communities (e.g., marshes, riparian systems, desert scrub, etc.). These species and natural communities are collectively referred to as inventory elements. The NDDB includes site records for all federally and state listed plants and animals, and all species that are candidates for listing. Also included are those species that are considered "sensitive" by government agencies and the conservation community. This is a computerized inventory and information is available for a fee in hardcopy and digital forms. As of November 1992, the NDDB contained about 20,450 locational records for 1,164 inventory elements.

How is NDDB information set up or organized?

NDDB data are organized geographically and taxonomically. Information can be retrieved by United States Geological Survey (USGS) map sheet (e.g., typically 1:24,000, 1:62,500, 1:100,000, or 1:250,000 scale), or by taxa. Most NDDB clients request information for USGS 7.5 minute quads. The approximately 49 square miles covered by a single USGS 7.5 minute quad is the smallest area for which we will perform a data retrieval. Due to the nature of our inventory, it is important that our clients consider inventory element locations on and near their project site or area of interest.

What types of information can I obtain?

Information from the NDDB is usually made available in three formats:

TEXT - Reports can be generated by 7.5' quad, 1:100,000 scale map, by county, or custom area. If the number of records for the region of interest exceed 200 (a report of about 25 pages in length), we prefer to use a digital format rather than relying on hardcopy reports. Reports vary in cost with the number of records involved. Our per record rates for our government/conservation clients is $4.00/record and $8.00/record for our commercial clients. Our experience has been that reports related to 7.5' quads usually vary between $140 and $270 each for our commercial clients.

OVERLAY - We have the ability to produce computer generated overlays for any scale base map you might have. These overlays have only the map features representing our inventory elements and a map sheet boarder for registration to your base map. Most of our clients request overlays for USGS 7.5' and 1:100,000 scale maps. Overlays cost $30.00 each.

RAREFIND - We can also make our data available via a microcomputer database application called *RAREFIND*. You can obtain our entire state wide data set or request that we customize the data set to a single county or a set of counties. *RAREFIND* is available by yearly subscription. The entire state cost is $1,250 government rate, or $2,500 commercial rate. You can call us for county pricing. A subscription includes an initial set of data with the *RAREFIND* application followed by an updated data set 6 months later. *RAREFIND* subscribers are also afforded a special rate of $20 per overlay. Costs for customized data sets will vary with the number of data base records involved. *RAREFIND* is a compiled, stand alone application that requires an IBM compatible microcomputer with adequate hard disk space (e.g., 5 to 23 MB) to run. No additional software is required.

How do I order information from the NDDB?

It is easy to request information from the NDDB. Call one of our Information Services staff at (916) 324-3812 to place your order by phone. It is most helpful to have the name or names of the 7.5' maps you want information for at hand when you call. We will tell you how many records we have in the NDDB for your area of interest and give you a cost estimate before we proceed with your request.

To what extent can information be customized to my needs?

For special requests, with adequate notification, our geographic information system allows us to customize our information products to your specific needs. For projects that affect large areas, you can send us a map showing your project boundaries. We can then enter this boundary into our system and use it to accurately determine what data we might have for your project area.

How long does it take to get information from the NDDB?

The usual turn around time for data requests is one to two weeks. We ask you to remember that this is a computerized system and it does go down from time to time. Such unforeseen, but not unexpected, events can interfere with our normal response time.

How do I pay?

You are invoiced directly from our accounting department after the products have been sent to you. You do not need to pay up front; however, delinquent accounts will be denied additional services until the balance has been paid.

NOTE: There is a 50% cancellation charge if you cancel your order after we have already processed your request and generated our products. There is a no return policy on products already delivered.

Why is there a charge for this information?

Our enabling legislation requires that we "insure cost-sharing by all who use the" NDDB, "and develop a fee structure to recover actual costs for use of the" NDDB. The Department of Finance has determined that this will include not only direct costs for generating and distributing our data, but will also include some program overhead. We recover about $225,000 per year in fees, which amount to about 25% of our program costs.

California Native Species Field Survey Form

Mail to:
Natural Diversity Data Base
California Department of Fish and Game
1416 Ninth Street, 12th Floor
Sacramento, California 95814

For office use only

Source Code _____ Quad Code _____

Elm Code _____ Occ # _____

Copy to _____ Map Index # _____

Date of field work ___ - ___ - ___
mo day year

Scientific Name:

Common Name:

Species Found? ☐ yes ☐ no _____ *If not, why?*

Total # Individuals _____ Subsequent visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ ☐ no ☐ unk.
Yes, Occ. #

Collection? If yes: _____ _____
number Museum/Herbarium

Reporter: _____

Address: _____

_____

Phone: ( ) _____

Plant Information

Phenology: _____ _____ _____
% vegetative % flowering % fruiting

Animal Information

Age Structure: _____ _____ _____
adults # juveniles # unknow

☐ nesting ☐ breeding ☐ foraging ☐ wintering ☐ roosting ☐ burrow site ☐ othe

Location **(Please also attach or draw map on back.)**

County: _____ Landowner/Mgr: _____

Quad Name: _____ Elevation: _____ UTM: _____

T ___ R ___ ¼ of ___ ¼ Sec ___ T ___ R ___ ¼ of ___ ¼ Sec ___

Habitat Description **(Plant communities, dominants, associates, substrate/soils, aspects/slope)**

Other rare spp.?

Site Information Overall site quality: ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Current/surrounding land use:

Visible disturbances, possible threats:

Comments:

Determination: **(Check one or more, fill in the blanks)**

___ Keyed in a site reference: _____

___ Compared with specimen housed at: _____

___ Compared with photo/drawing in: _____

___ By another person (name): _____

___ Other: _____

Photographs: (Check one or more)	Slide	Print
Plant/animal	___	___
Habitat	___	___
Diagnostic Feature	___	___

May we obtain duplicates at our expense? ☐ Yes ☐

EXHIBIT 4

U.S. FISH AND WILDLIFE VERNAL POOL DATA SHEET FOR WET SEASON SURVEYS

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: ____/____/____ Time: _____ County: _____ Quad: _____

Collector(s): _____ Permit #: _____

Site/Project Name: _____ Pool #: _____

Township: _____ Range: _____ Section: _____ _____lat._____long.

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

Pool Depth:
at time of sampling: _____cm
estimated maximum: _____cm

Surface Area:
at time of sampling: _____m x _____m
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 NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

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

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:

(USF&WS rev. 4/96)

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)

(Optional) Species Observations:

Cladocerans:	yes	no	Insects: (adult or larvae)		
Conchostracans:	yes	no	Anisoptera:	yes	no
Copepods:	yes	no	Zygoptera:	yes	no
Ostracods	yes	no	Hydrophilidae:	yes	no
Fish	yes	no	Dytiscidae:	yes	no
Frogs	yes	no	Corixidae:	yes	no
Salamanders	yes	no	Notonectidae:	yes	no
Waterfowl	yes	no	Belostomatidae:	yes	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 #

EXHIBIT 5

VERNAL POOL CRUSTACEAN SURVEY DATA DICTIONARY

VERNAL POOL CRUSTACEAN SURVEY DATA DICTIONARY	
Lead Biologist (circle one):	Ellis Genaris Garcia Walker Zebell Piazza
Watershed ID:	Date:
Pool ID: (Watershed ID, Pool ID, Visit #)	
Weather Conditions (circle one):	Sunny Sunny/Windy Overcast Overcast/Windy Raining Raining/Windy
Air Temperature (Celsius):	
Hydrology:	Dry Wet
Area (sq. ft):	
Habitat Condition (circle one):	Disturbed Undisturbed
Grazed (circle one):	Yes No
Water Depth (inches):	
Turbidity (circle one):	Clear Clear - Tea Clear - Turbid Turbid
Water Temp (Celsius):	
Branchinecta sp.#:	None 1 thru 10 11-100 101-1000 1000+
Lepidurus sp.#:	None 1 thru 10 11-100 101-1000 1000+
Other Crustaceans:	
Ambystoma:	Present Absent
Scaphiopus:	Present Absent
Hyla:	Present Absent
Bufo:	Present Absent
Other Sp.:	
Comments:	

EXHIBIT 6

VERNAL POOL CRUSTACEAN DATABASE

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR02	1						2/6/99	12:17:02PM
BR02	2			x			2/6/99	12:43:05PM
BR02	3			x			2/6/99	01:19:20PM
BR02	4						2/6/99	02:16:35PM
BR02	5						2/6/99	02:34:30PM
BR02	6	x		x			2/6/99	02:58:39PM
BR02	7						2/6/99	03:36:53PM
BR02	8			x			2/6/99	04:15:52PM
BR02	9						2/7/99	10:35:16AM
BR02	10						2/7/99	10:58:18AM
BR02	11	x					2/7/99	11:27:04AM
BR02	12	x					2/7/99	11:44:41AM
BR02	13						2/7/99	12:21:18PM
BR02	14						2/7/99	12:46:50PM
BR02	15						2/7/99	01:23:55PM
BR02	16						2/7/99	01:57:56PM
BR02	17						2/7/99	03:46:40PM
BR02	18						2/7/99	04:08:08PM
BR02	19						2/15/99	10:43:43AM
BR02	20						2/15/99	10:56:02AM
BR02	21						2/15/99	11:13:17AM
BR02	22						2/15/99	11:27:01AM
BR02	23	x					2/15/99	11:41:33AM
BR02	24						2/15/99	11:55:26AM
BR03A	1						2/11/99	08:39:17AM
BR03A	2						2/11/99	08:49:44AM
BR03A	3						2/11/99	08:56:45AM
BR03A	4						2/11/99	09:05:00AM
BR03A	5						2/11/99	09:14:48AM
BR03A	6						2/11/99	09:20:29AM
BR03A	7						2/11/99	09:27:57AM
BR03A	8						2/11/99	09:37:13AM
BR03A	9	x					2/11/99	10:02:04AM
BR03A	10						2/11/99	10:07:19AM
BR03A	11	x					2/11/99	10:13:10AM
BR03A	12	x					2/11/99	10:18:20AM
BR03A	13						2/11/99	10:22:47AM
BR03A	14						2/11/99	10:31:55AM
BR03A	15						2/11/99	10:41:12AM
BR03A	16	x		x			2/11/99	10:46:53AM
BR03A	17	x					2/11/99	10:52:19AM
BR03A	18	x					2/15/99	12:42:37PM
BR03A	19	x					2/15/99	01:16:52PM
BR03A	20	x					2/15/99	01:34:05PM
BR03A	21						2/15/99	01:51:59PM
BR03A	22						2/15/99	02:08:38PM
BR03A	23						2/8/99	03:12:31PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR03A	24			x			2/8/99	03:19:45PM
BR03A	25						2/10/99	08:57:52AM
BR03A	26			x			2/10/99	09:04:14AM
BR03B	1						2/10/99	09:09:06AM
BR03B	2			x			2/10/99	09:14:57AM
BR03B	3						2/10/99	09:19:59AM
BR03B	4			x			2/10/99	09:32:04AM
BR03B	5						2/10/99	09:38:47AM
BR03B	6						2/10/99	09:51:02AM
BR03B	7			x			2/10/99	09:54:42AM
BR03B	8						2/10/99	10:14:44AM
BR03B	9						2/10/99	10:42:27AM
BR03B	10						2/10/99	10:56:41AM
BR03B	11						2/10/99	11:03:04AM
BR03B	12						2/10/99	11:15:31AM
BR03B	13						2/15/99	10:23:34AM
BR03B	14						2/15/99	10:40:55AM
BR03B	15						2/15/99	11:05:39AM
BR03B	16						2/15/99	11:25:10AM
BR03B	17						2/15/99	11:43:08AM
BR03B	18						2/15/99	11:57:51AM
BR03B	19	x		x			2/16/99	08:53:59AM
BR03B	20	x					2/16/99	09:05:24AM
BR03B	21						2/16/99	09:15:52AM
BR03B	22	x					2/16/99	09:30:39AM
BR03B	23	x			x		2/16/99	09:37:54AM
BR03B	24	x					2/8/99	09:42:02AM
BR03B	25	x					2/8/99	10:15:17AM
BR03B	26	x					2/8/99	10:39:06AM
BR05	1						2/8/99	10:55:33AM
BR05	2						2/8/99	11:11:11AM
BR05	3			x			2/8/99	11:28:16AM
BR05	4						2/8/99	11:39:24AM
BR05	5			x			2/8/99	11:50:51AM
BR05	6						2/8/99	11:57:56AM
BR05	7			x			2/8/99	12:10:16PM
BR05	8						2/8/99	12:26:28PM
BR05	9			x			2/8/99	01:11:39PM
BR05	10			x			2/8/99	01:41:57PM
BR05	11			x			2/8/99	01:49:42PM
BR05	12						2/8/99	02:11:07PM
BR05	13			x			2/8/99	02:17:49PM
BR05	14						2/8/99	02:37:43PM
BR05	15						2/8/99	02:51:57PM
BR05	16			x			2/8/99	03:00:00PM
BR05	17						2/8/99	03:19:02PM
BR05	18			x			2/8/99	03:35:06PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR05	19			x			2/17/99	10:17:22AM
BR05	20			x			2/17/99	10:24:18AM
BR05	21			x			2/17/99	10:30:14AM
BR05	22			x			2/17/99	10:41:05AM
BR06	1						2/17/99	10:46:23AM
BR06	2						2/5/99	02:34:51PM
BR06	3						2/5/99	02:48:38PM
BR06	4			x			2/5/99	02:59:28PM
BR06	5			x			2/5/99	03:09:47PM
BR06	6						2/5/99	03:20:54PM
BR06	7			x			2/5/99	03:37:27PM
BR06	8						2/5/99	03:52:37PM
BR06	9						2/5/99	04:12:35PM
BR06	10						2/8/99	10:14:15AM
BR06	11			x			2/8/99	10:24:33AM
BR06	12			x			2/8/99	10:34:18AM
BR06	13						2/8/99	10:42:14AM
BR06	14						2/8/99	10:49:49AM
BR06	15			x			2/8/99	10:57:46AM
BR06	16						2/8/99	11:00:00AM
BR06	17			x			2/8/99	11:12:46AM
BR06	18						2/8/99	11:17:39AM
BR06	19						2/8/99	11:26:28AM
BR06	20			x			2/8/99	11:37:04AM
BR06	21						2/8/99	11:48:57AM
BR06	22			x			2/8/99	11:57:58AM
BR06	23			x			2/8/99	12:05:53PM
BR06	24	x					2/8/99	12:14:28PM
BR06	25	x					2/8/99	12:18:03PM
BR06	26			x			2/8/99	12:26:30PM
BR10	1						2/8/99	12:46:00PM
BR10	2						2/4/99	11:39:31AM
BR10	3						2/4/99	12:19:25PM
BR10	4	x					2/4/99	01:50:28PM
BR10	5						2/4/99	02:34:10PM
BR10	6						2/4/99	03:37:08PM
BR10	7						2/4/99	04:12:55PM
BR10	8						2/5/99	10:00:20AM
BR10	9						2/5/99	10:30:12AM
BR10	10						2/5/99	11:04:03AM
BR10	11						2/5/99	11:29:53AM
BR10	12						2/5/99	12:00:05PM
BR10	13	x					2/5/99	12:26:53PM
BR10	14	x					2/5/99	01:25:03PM
BR10	15						2/5/99	01:57:35PM
BR10	16						2/5/99	02:25:32PM
BR10	17						2/5/99	02:46:23PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR10	18						2/5/99	03:17:20PM
BR10	19						2/5/99	03:45:11PM
BR10	20	x		x			2/5/99	04:14:45PM
BR10	21						2/5/99	04:29:34PM
BR10	22	x	x				2/6/99	10:48:34AM
BR12	1						2/6/99	11:12:37AM
BR12	2						2/4/99	12:52:06PM
BR12	3						2/4/99	01:59:02PM
BR12	4						2/4/99	02:47:26PM
BR12	5						2/4/99	03:11:24PM
BR12	6						2/4/99	03:40:50PM
BR12	7						2/5/99	09:30:54AM
BR12	8						2/5/99	09:50:49AM
BR12	9						2/5/99	10:07:43AM
BR12	10						2/5/99	10:27:52AM
BR12	11						2/5/99	10:50:20AM
BR12	12	x					2/5/99	11:05:09AM
BR12	13						2/5/99	11:24:57AM
BR12	14						2/5/99	11:43:44AM
BR12	15						2/5/99	12:48:51PM
BR12	16	x					2/5/99	01:12:57PM
BR12	17						2/5/99	01:39:17PM
BR12	18	x					2/5/99	01:52:24PM
BR12	19						2/5/99	02:04:43PM
BR12	20	x					2/5/99	02:37:04PM
BR12	21	x					2/5/99	02:43:43PM
BR12	22	x					2/5/99	03:02:56PM
BR12	23						2/5/99	03:17:42PM
BR12	24						2/5/99	03:30:05PM
BR12	25						2/17/99	12:14:32PM
BR12	26						2/17/99	12:35:16PM
BR12	27						2/17/99	12:47:54PM
FC02	1	x					2/11/99	04:07:55PM
FC02	2	x					2/11/99	04:16:21PM
FC02	3	x					2/11/99	04:31:51PM
FC02	4						2/11/99	04:48:56PM
FC02	5						2/12/99	08:16:02AM
FC02	6						2/12/99	08:30:14AM
FC02	7						2/12/99	08:40:46AM
FC02	8						2/12/99	08:49:13AM
FC02	9						2/12/99	08:58:17AM
FC02	10						2/12/99	09:11:28AM
FC02	11						2/12/99	09:22:35AM
FC02	12						2/12/99	09:28:19AM
FC02	13	x					2/12/99	09:32:08AM
FC02	14						2/12/99	09:44:18AM
FC02	15	x					2/12/99	09:55:37AM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC02	16	x					2/12/99	10:05:36AM
FC02	17	x					2/12/99	10:24:33AM
FC02	18	x					2/12/99	10:29:38AM
FC02	19	x					2/12/99	10:37:38AM
FC02	20			x			2/12/99	10:45:04AM
FC02	21	x					2/12/99	10:51:04AM
FC02	22	x					2/12/99	10:56:15AM
FC02	23	x					2/16/99	08:54:38AM
FC02	24						2/16/99	09:16:52AM
FC02	25	x					2/16/99	09:25:11AM
FC02	26						2/16/99	09:49:41AM
FC03	1						2/16/99	10:05:32AM
FC03	2						2/16/99	10:16:10AM
FC03	3						2/16/99	10:37:07AM
FC03	4						2/16/99	10:58:12AM
FC03	5						2/16/99	11:08:53AM
FC03	6						2/16/99	11:29:58AM
FC03	7						2/16/99	11:43:49AM
FC03	8						2/16/99	11:49:39AM
FC03	9						2/10/99	09:12:46AM
FC03	10						2/10/99	09:28:08AM
FC03	11						2/10/99	09:39:42AM
FC03	12						2/10/99	09:55:30AM
FC03	13						2/10/99	10:20:22AM
FC03	14	x					2/10/99	10:36:08AM
FC03	15						2/10/99	10:45:24AM
FC03	16						2/10/99	10:50:39AM
FC03	17						2/10/99	11:19:27AM
FC03	18	x					2/10/99	11:33:37AM
FC03	19				x		2/10/99	11:45:15AM
FC03	20	x					2/10/99	11:50:59AM
FC03	21	x					2/10/99	12:21:38PM
FC03	22						2/10/99	01:08:12PM
FC03	23	x					2/10/99	01:16:55PM
FC03	24	x					2/10/99	01:32:57PM
FC05	1						2/16/99	03:36:37PM
FC05	2						2/16/99	03:47:49PM
FC05	3						2/16/99	03:55:07PM
FC05	4						2/16/99	04:04:18PM
FC05	5						2/16/99	04:09:38PM
FC05	6						2/16/99	04:24:47PM
FC05	7						2/17/99	09:11:39AM
FC05	8						2/17/99	09:25:18AM
FC05	9						2/17/99	09:30:00AM
FC05	10						2/17/99	09:42:38AM
FC05	11						2/10/99	02:00:40PM
FC05	12						2/10/99	02:10:36PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC08	1						2/10/99	02:18:42PM
FC08	2						2/10/99	02:29:05PM
FC08	3						2/10/99	02:41:38PM
FC08	4						2/10/99	03:04:29PM
FC08	5						2/10/99	03:17:36PM
FC08	6						2/10/99	03:28:06PM
FC08	7						2/10/99	03:43:35PM
FC08	8						2/10/99	03:50:52PM
FC08	9						2/10/99	04:00:00PM
FC08	10						2/10/99	04:07:25PM
FC08	11						2/10/99	04:14:20PM
FC08	12						2/11/99	08:03:13AM
FC08	13						2/11/99	08:21:51AM
FC08	14						2/11/99	08:31:19AM
FC08	15						2/11/99	08:39:12AM
FC08	16				x		2/16/99	02:10:23PM
FC08	17						2/16/99	02:37:19PM
FC08	18			x			2/16/99	02:46:40PM
FC08	19			x			2/16/99	02:58:43PM
FC08	20			x			2/16/99	03:07:20PM
FC10	1						2/16/99	03:15:17PM
FC10	2	x					2/16/99	03:23:20PM
FC10	3						2/11/99	09:00:22AM
FC10	4						2/11/99	09:12:40AM
FC10	5						2/11/99	09:31:41AM
FC10	6						2/11/99	09:32:56AM
FC10	7						2/11/99	09:47:29AM
FC10	8						2/11/99	09:59:39AM
FC10	9	x					2/11/99	10:26:01AM
FC10	10						2/11/99	10:33:37AM
FC10	11						2/11/99	10:39:03AM
FC10	12						2/11/99	10:58:23AM
FC10	13						2/11/99	11:07:29AM
FC10	14						2/11/99	11:19:35AM
FC10	15						2/11/99	11:37:37AM
FC10	16						2/11/99	12:52:45PM
FC10	17						2/11/99	01:00:34PM
FC10	18						2/11/99	01:09:11PM
FC10	19						2/11/99	01:14:15PM
FC10	20						2/11/99	01:18:49PM
FC10	21						2/11/99	01:27:25PM
FC10	22						2/11/99	01:30:43PM
FC10	23						2/11/99	01:38:47PM
FC10	24						2/11/99	01:44:51PM
FC10	25						2/11/99	01:54:18PM
FC10	26			x			2/11/99	02:01:08PM
FC10	27			x			2/11/99	02:35:07PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC10	28			x			2/11/99	02:49:48PM
FC10	29			x			2/11/99	03:01:19PM
FC10	30			x			2/11/99	03:20:08PM
FC10	31						2/11/99	03:38:29PM
FC10	32						2/16/99	12:16:54PM
FC10	33			x			2/16/99	12:35:43PM
FC10	34			x			2/16/99	01:12:42PM
LG01	1						2/10/99	02:20:33PM
LG01	2						2/10/99	02:29:23PM
LG01	3						2/10/99	02:33:09PM
LG01	4						2/10/99	02:37:11PM
LG01	5						2/10/99	02:42:17PM
LG01	6						2/10/99	02:46:54PM
LG01	7						2/10/99	02:56:55PM
LG01	8						2/10/99	03:07:30PM
LG01	9						2/10/99	03:13:57PM
LG01	10						2/10/99	03:17:49PM
LG01	11						2/10/99	03:25:55PM
LG01	12						2/11/99	07:44:27AM
LG01	13						2/11/99	07:56:21AM
LG01	14						2/11/99	08:02:02AM
LG01	15						2/11/99	08:16:01AM
LG01	16						2/11/99	08:24:29AM
LG01	17						2/11/99	08:28:42AM
LG01	18						2/11/99	08:34:17AM
LG01	19						2/12/99	02:09:43PM
LG01	20						2/12/99	02:27:36PM
LG01	21						2/12/99	02:32:07PM
LG01	22						2/12/99	02:38:41PM
LG01	23						2/17/99	01:15:58PM
LG01	24						2/17/99	02:15:59PM
LG01	25						2/17/99	02:26:09PM
LG01	26						2/17/99	02:42:10PM
LG02	1						2/11/99	09:36:10AM
LG02	2						2/11/99	09:42:40AM
LG02	3						2/11/99	09:51:33AM
LG02	4						2/11/99	09:58:12AM
LG02	5						2/11/99	10:02:43AM
LG02	6						2/11/99	10:07:06AM
LG02	7						2/11/99	10:34:38AM
LG02	8						2/11/99	10:41:39AM
LG02	9						2/11/99	10:50:02AM
LG02	10						2/11/99	10:55:59AM
LG02	11						2/11/99	11:00:01AM
LG02	12						2/11/99	11:06:16AM
LG02	13						2/11/99	11:09:56AM
LG02	14						2/11/99	11:17:10AM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG02	15						2/11/99	11:24:53AM
LG02	16						2/11/99	11:28:39AM
LG02	17						2/11/99	11:31:53AM
LG02	18						2/15/99	01:44:55PM
LG02	19						2/15/99	01:54:14PM
LG02	20						2/15/99	02:13:17PM
LG02	21						2/15/99	02:24:38PM
LG02	22						2/17/99	10:24:22AM
LG02	23						2/17/99	10:58:57AM
LG02	24						2/17/99	11:21:44AM
LG02	25						2/17/99	11:33:01AM
LG02	26						2/17/99	11:51:49AM
LG03	1						2/11/99	09:00:15AM
LG03	2						2/11/99	09:09:53AM
LG03	3						2/11/99	09:18:31AM
LG03	4						2/10/99	11:45:57AM
LG03	5						2/10/99	12:16:04PM
LG03	6						2/10/99	12:21:31PM
LG03	7						2/10/99	12:26:10PM
LG03	8						2/10/99	12:30:06PM
LG03	9						2/10/99	12:35:11PM
LG03	10						2/10/99	12:43:21PM
LG03	11						2/10/99	12:58:32PM
LG03	12						2/10/99	01:07:39PM
LG03	13						2/10/99	01:12:17PM
LG03	14						2/10/99	01:17:27PM
LG03	15						2/10/99	01:22:30PM
LG03	16						2/10/99	01:27:33PM
LG03	17						2/10/99	01:32:21PM
LG03	18						2/10/99	01:35:00PM
LG03	19						2/10/99	01:39:30PM
LG03	20						2/12/99	02:59:07PM
LG03	21						2/12/99	03:16:26PM
LG03	22						2/12/99	03:21:09PM
LG03	23			x			2/12/99	03:27:00PM
LG03	24			x			2/12/99	03:30:36PM
LG03	25			x			2/12/99	03:35:30PM
LG03	26						2/12/99	03:45:23PM
LG04	1						2/12/99	03:49:30PM
LG04	2						2/12/99	03:54:18PM
LG04	3						2/12/99	03:57:34PM
LG04	4						2/11/99	03:28:12PM
LG04	5						2/11/99	03:33:43PM
LG04	6						2/11/99	03:36:50PM
LG04	7						2/11/99	03:40:22PM
LG04	8						2/11/99	03:44:20PM
LG04	9						2/11/99	03:49:34PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG04	10						2/11/99	03:54:16PM
LG04	11						2/11/99	03:58:14PM
LG04	12						2/11/99	04:02:37PM
LG04	13						2/11/99	04:06:57PM
LG04	14						2/11/99	04:10:35PM
LG04	15						2/11/99	04:14:15PM
LG04	16						2/11/99	04:19:18PM
LG04	17						2/11/99	04:32:44PM
LG04	18						2/11/99	04:34:52PM
LG04	19						2/11/99	04:39:16PM
LG04	20						2/11/99	04:41:58PM
LG04	21						2/16/99	03:27:19PM
LG04	22						2/16/99	03:42:49PM
LG04	23						2/16/99	04:15:35PM
LG04	24						2/16/99	04:33:11PM
LG04	25						2/16/99	04:36:57PM
LG04	26			x			2/17/99	09:09:37AM
LG05	1						2/17/99	09:21:51AM
LG05	2						2/17/99	09:34:39AM
LG05	3						2/17/99	09:51:31AM
LG05	4						2/10/99	08:56:09AM
LG05	5						2/10/99	09:13:22AM
LG05	6						2/10/99	09:23:31AM
LG05	7						2/10/99	09:36:33AM
LG05	8						2/10/99	09:47:16AM
LG05	9						2/10/99	09:55:02AM
LG05	10						2/10/99	10:01:01AM
LG05	11						2/10/99	10:07:28AM
LG05	12						2/10/99	10:33:21AM
LG05	13						2/10/99	10:57:07AM
LG05	14						2/10/99	11:05:04AM
LG05	15						2/10/99	11:14:28AM
LG05	16						2/10/99	11:25:12AM
LG05	17						2/10/99	11:32:22AM
LG05	18						2/10/99	11:39:30AM
LG06	1						2/10/99	11:50:24AM
LG06	2						2/16/99	12:20:45PM
LG06	3						2/16/99	12:39:19PM
LG06	4	x					2/16/99	12:46:46PM
LG06	5	x					2/16/99	12:59:39PM
LG06	6						2/16/99	01:48:45PM
LG06	7	x					2/16/99	02:04:56PM
LG06	8						2/16/99	02:21:54PM
LG06	9						2/16/99	02:31:16PM
LG06	10						2/16/99	02:51:05PM
LG06	11						2/16/99	02:56:44PM
LG06	12						2/10/99	01:01:18PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG06	13						2/10/99	01:10:30PM
LG06	14	x					2/10/99	01:20:07PM
LG06	15				x		2/10/99	01:26:35PM
LG06	16						2/10/99	01:31:23PM
LG06	17						2/10/99	01:40:21PM
LG06	18						2/10/99	01:57:07PM
LG06	19						2/10/99	02:16:59PM
LG06	20						2/10/99	02:22:43PM
LG06	21						2/10/99	02:29:51PM
LG06	22						2/10/99	02:36:27PM
LG06	23						2/10/99	02:46:11PM
LG06	24						2/10/99	02:56:39PM
LG06	25	x					2/10/99	03:07:27PM
LG06	26						2/10/99	03:13:40PM
LG08	1			x			2/10/99	03:28:57PM
LG08	2			x			2/16/99	11:27:31AM
LG08	3						2/16/99	11:36:15AM
LG08	4	x					2/8/99	12:33:51PM
LG08	5						2/8/99	12:43:33PM
LG08	6			x			2/8/99	12:58:14PM
LG08	7			x			2/8/99	12:59:24PM
LG08	8						2/8/99	01:13:02PM
LG08	9	x					2/8/99	01:26:39PM
LG08	10	x		x			2/8/99	01:42:04PM
LG08	11	x		x			2/8/99	01:54:06PM
LG08	12						2/8/99	02:01:29PM
LG08	13	x					2/8/99	02:13:31PM
LG08	14	x		x			2/8/99	02:25:29PM
LG08	15	x					2/8/99	02:32:52PM
LG08	16						2/8/99	02:43:07PM
LG08	17	x					2/8/99	02:54:47PM
LG08	18						2/8/99	03:08:36PM
LG08	19						2/8/99	03:23:00PM
LG08	20	x		x			2/16/99	08:46:29AM
LG08	21						2/16/99	08:57:39AM
LG08	22						2/16/99	09:07:39AM
LG08	23						2/16/99	09:19:00AM
LG08	24						2/16/99	09:27:58AM
LG08	25	x		x			2/16/99	09:39:21AM
LG08	26						2/16/99	10:06:52AM
LG09	1	x					2/16/99	10:30:00AM
LG09	2						2/16/99	10:54:51AM
LG09	3						2/16/99	11:04:55AM
LG09	4						2/6/99	01:20:49PM
LG09	5						2/6/99	02:17:48PM
LG09	6						2/6/99	02:43:49PM
LG09	7		x				2/6/99	02:59:19PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG09	8	x					2/6/99	03:13:27PM
LG09	9						2/6/99	03:30:29PM
LG09	10						2/6/99	04:00:49PM
LG09	11	x					2/7/99	09:44:44AM
LG09	12						2/7/99	10:07:44AM
LG09	13	x					2/7/99	10:30:25AM
LG09	14	x					2/7/99	10:54:53AM
LG09	15						2/7/99	11:33:50AM
LG09	16			x		x	2/7/99	11:47:54AM
LG09	17						2/7/99	12:56:21PM
LG09	18						2/7/99	01:47:45PM
LG09	19						2/7/99	02:17:30PM
LG09	20						2/7/99	02:41:45PM
LG09	21						2/7/99	03:00:23PM
LG09	22						2/7/99	03:20:15PM
LG09	23						2/7/99	03:59:05PM
LG09	24		x		x		2/8/99	09:13:58AM
LG09	25						2/8/99	09:32:58AM
LG09	26	x				x	2/8/99	09:41:12AM
LG14	1						2/8/99	09:52:02AM
LG14	2						2/8/99	10:01:54AM
LG14	3						2/8/99	10:14:55AM
LG14	4						2/11/99	11:25:33AM
LG14	5						2/11/99	11:37:52AM
LG14	6						2/11/99	11:44:21AM
LG14	7						2/11/99	11:48:44AM
LG14	8						2/11/99	12:10:00PM
LG14	9						2/11/99	12:16:39PM
LG14	10						2/11/99	12:53:13PM
LG14	11						2/11/99	01:27:00PM
LG14	12						2/11/99	01:36:32PM
LG14	13						2/11/99	01:48:10PM
LG14	14						2/11/99	01:52:03PM
LG14	15						2/11/99	02:01:10PM
LG14	16						2/11/99	02:06:49PM
LG14	17						2/11/99	02:18:35PM
LG14	18						2/11/99	02:37:03PM
LG14	19	x					2/11/99	02:44:14PM
LG14	20						2/11/99	02:55:00PM
LG14	21	x					2/15/99	02:55:57PM
LG14	22						2/15/99	03:07:25PM
LG14	23	x					2/15/99	03:16:15PM
LG14	24						2/15/99	03:42:05PM
LG14	25						2/15/99	03:47:13PM
LG14	26	x					2/15/99	03:56:16PM
LG15	1						2/17/99	10:31:09AM
LG15	2						2/17/99	10:41:10AM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG15	3						2/17/99	11:13:02AM
MC02	1						2/12/99	11:12:12AM
MC02	2						2/12/99	11:20:59AM
MC02	3						2/12/99	11:31:44AM
MC02	4						2/12/99	11:43:34AM
MC02	5						2/12/99	11:47:17AM
MC02	6						2/12/99	11:54:19AM
MC02	7						2/12/99	12:16:32PM
MC02	8						2/12/99	12:25:31PM
MC02	9						2/12/99	12:30:52PM
MC02	10						2/12/99	12:37:09PM
MC02	11						2/12/99	12:49:58PM
MC02	12						2/12/99	12:56:34PM
MC02	13						2/12/99	01:05:17PM
MC02	14						2/12/99	01:11:28PM
MC02	15						2/12/99	01:21:33PM
MC02	16						2/12/99	01:27:51PM
MC02	17						2/12/99	01:33:43PM
MC02	18						2/15/99	11:55:22AM
MC02	19						2/15/99	12:01:37PM
MC02	20						2/15/99	12:09:23PM
MC02	21						2/15/99	12:44:18PM
MC02	22						2/15/99	12:54:35PM
MC02	23						2/15/99	01:04:20PM
MC02	24			x			2/15/99	01:22:55PM
MC02	25						2/15/99	01:26:47PM
MC02	26						2/15/99	01:30:23PM
MC02	27						2/15/99	02:01:26PM
MC02	28			x			2/15/99	02:13:03PM
MC02	29						2/15/99	02:22:34PM
MC02	30	x					2/15/99	02:40:46PM
MC02	31						2/15/99	02:53:13PM
MC02	32	x					2/15/99	03:00:10PM
MC02	33						2/15/99	03:22:55PM
MC02	34						2/15/99	03:29:45PM
MC02	35						2/15/99	03:40:12PM
MC02	36						2/15/99	03:46:22PM
MC02	37						2/15/99	03:55:41PM
MC02	38			x			2/15/99	03:59:34PM
MC02	39						2/15/99	04:11:24PM
MC03	1						2/12/99	10:23:12AM
MC03	2						2/12/99	10:30:20AM
MC03	3						2/12/99	10:33:41AM
MC03	4						2/12/99	10:38:05AM
MC03	5						2/12/99	10:41:47AM
MC03	6						2/12/99	10:47:52AM
MC03	7						2/12/99	11:00:01AM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC03	8						2/12/99	11:03:16AM
MC03	9						2/12/99	11:11:14AM
MC03	10						2/12/99	11:14:22AM
MC03	11						2/12/99	11:21:54AM
MC03	12						2/12/99	11:25:53AM
MC03	13						2/12/99	11:29:28AM
MC03	14						2/12/99	11:33:26AM
MC03	15						2/12/99	11:36:44AM
MC03	16						2/12/99	11:46:08AM
MC03	17						2/12/99	11:50:34AM
MC03	18						2/12/99	11:59:23AM
MC03	19						2/12/99	12:06:15PM
MC03	20						2/12/99	12:34:35PM
MC03	21						2/12/99	12:40:15PM
MC03	22						2/12/99	12:43:54PM
MC03	23						2/12/99	12:47:07PM
MC03	24			x			2/17/99	02:42:49PM
MC03	25			x			2/17/99	02:54:18PM
MC03	26						2/17/99	03:22:30PM
MC05	1						2/12/99	02:42:08PM
MC05	2						2/12/99	03:01:09PM
MC05	3	x					2/12/99	03:11:38PM
MC05	4						2/12/99	03:23:26PM
MC05	5						2/12/99	03:53:14PM
MC05	6						2/12/99	04:00:18PM
MC05	7						2/12/99	04:13:18PM
MC05	8	x					2/12/99	04:10:59PM
MC05	9						2/12/99	04:26:48PM
MC05	10						2/12/99	04:26:38PM
MC05	11						2/12/99	04:30:17PM
MC05	12						2/12/99	04:31:19PM
MC05	13						2/15/99	10:09:04AM
MC05	14						2/15/99	10:38:38AM
MC05	15	x					2/15/99	11:08:32AM
MC05	16						2/15/99	11:26:48AM
MC05	17						2/15/99	11:38:27AM
MC06	1						2/12/99	11:33:57AM
MC06	2						2/12/99	11:41:58AM
MC06	3						2/12/99	11:49:02AM
MC06	4						2/12/99	12:10:41PM
MC06	5	x					2/12/99	12:59:55PM
MC06	6						2/12/99	01:07:45PM
MC06	7						2/12/99	01:11:27PM
MC06	8						2/12/99	01:17:34PM
MC06	9						2/12/99	01:24:47PM
MC06	10						2/12/99	01:31:14PM
MC06	11						2/12/99	01:37:06PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC06	12						2/12/99	01:42:44PM
MC06	13						2/12/99	01:54:50PM
MC06	14	x					2/12/99	01:59:42PM
MC06	15	x					2/12/99	02:09:19PM
MC06	16	x					2/12/99	02:20:04PM
MC06	17						2/12/99	02:36:35PM
MC06	18						2/12/99	03:45:30PM
MC06	19						2/12/99	03:54:02PM
MC06	20						2/12/99	03:59:43PM
MC06	21						2/17/99	01:58:27PM
MC06	22						2/17/99	02:09:45PM
MC06	23						2/17/99	02:17:38PM
MC06	24						2/17/99	02:28:21PM
MC06	25	x					2/17/99	02:34:25PM
MC06	26						2/17/99	02:44:05PM
MC07	1						2/12/99	08:32:21AM
MC07	2						2/12/99	08:41:27AM
MC07	3						2/12/99	08:45:54AM
MC07	4						2/12/99	08:53:23AM
MC07	5						2/12/99	08:58:02AM
MC07	6						2/12/99	09:04:30AM
MC07	7	x					2/12/99	09:09:01AM
MC07	8						2/12/99	09:21:53AM
MC07	9	x					2/12/99	09:28:15AM
MC07	10	x					2/12/99	09:39:30AM
MC07	11						2/12/99	10:16:07AM
MC07	12						2/12/99	10:22:09AM
MC07	13						2/12/99	10:29:40AM
MC07	14	x					2/12/99	10:35:24AM
MC07	15			x			2/12/99	10:52:02AM
MC07	16						2/12/99	11:02:33AM
MC07	17	x					2/12/99	11:12:55AM
MC07	18	x					2/17/99	12:06:33PM
MC07	19				x		2/17/99	12:23:36PM
MC07	20	x					2/17/99	12:36:29PM
MC07	21			x			2/17/99	12:59:29PM
MC07	22						2/17/99	01:08:11PM
MC07	23						2/17/99	01:15:36PM
MC07	24			x			2/17/99	01:19:41PM
MC07	25						2/17/99	01:31:48PM
MC07	26			x			2/17/99	01:39:42PM
YL01	1						2/12/99	08:11:46AM
YL01	2						2/12/99	08:21:16AM
YL01	3						2/12/99	08:24:20AM
YL01	4						2/12/99	08:27:35AM
YL01	5	x					2/12/99	08:33:15AM
YL01	6						2/12/99	08:45:24AM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
YL01	7						2/12/99	08:49:17AM
YL01	8						2/12/99	08:54:09AM
YL01	9						2/12/99	08:57:09AM
YL01	10						2/12/99	09:02:45AM
YL01	11						2/12/99	09:06:25AM
YL01	12						2/12/99	09:10:05AM
YL01	13						2/12/99	09:14:11AM
YL01	14						2/12/99	09:18:21AM
YL01	15						2/12/99	09:22:14AM
YL01	16						2/12/99	09:28:30AM
YL01	17						2/12/99	09:32:15AM
YL01	18						2/12/99	09:35:20AM
YL01	19						2/12/99	09:38:33AM
YL01	20						2/12/99	09:41:47AM
YL01	21						2/12/99	09:46:47AM
YL01	22						2/12/99	09:53:21AM
YL01	23						2/12/99	09:54:29AM
YL01	24						2/15/99	03:39:22PM
YL01	25						2/15/99	03:50:45PM
YL01	26						2/15/99	03:59:03PM
YL02	1						2/11/99	12:29:39PM
YL02	2						2/11/99	12:42:07PM
YL02	3						2/11/99	12:49:26PM
YL02	4						2/11/99	12:51:04PM
YL02	5						2/11/99	12:56:12PM
YL02	6						2/11/99	01:27:31PM
YL02	7						2/11/99	01:34:30PM
YL02	8						2/11/99	01:37:26PM
YL02	9						2/11/99	01:40:00PM
YL02	10						2/11/99	01:50:08PM
YL02	11						2/11/99	01:54:43PM
YL02	12						2/11/99	01:56:33PM
YL02	13						2/11/99	02:00:40PM
YL02	14						2/11/99	02:04:12PM
YL02	15						2/11/99	02:07:44PM
YL02	16						2/11/99	02:11:07PM
YL02	17	x					2/11/99	02:15:33PM
YL02	18						2/11/99	02:24:24PM
YL02	19						2/11/99	02:28:48PM
YL02	20						2/11/99	02:38:32PM
YL02	21	x					2/11/99	02:50:46PM
YL02	22						2/11/99	02:58:37PM
YL02	23	x					2/11/99	03:08:32PM
YL02	24						2/11/99	03:19:32PM
YL02	25						2/11/99	03:39:58PM
YL02	26						2/11/99	03:44:57PM
YL02	27						2/11/99	03:55:01PM

Presence and Absence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #1

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
YL02	28						2/11/99	04:05:23PM
YL02	29						2/11/99	04:09:04PM
YL02	30						2/11/99	04:12:44PM
YL02	31						2/11/99	04:15:36PM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR02	1						2/19/99	01:29:48PM
BR02	2	x					2/19/99	01:24:42PM
BR02	3	x					2/19/99	01:19:01PM
BR02	4						2/19/99	12:18:26PM
BR02	5						2/19/99	12:05:32PM
BR02	6	x					2/19/99	11:46:48AM
BR02	7						2/19/99	09:40:16AM
BR02	8	x					2/19/99	12:31:22PM
BR02	9				x		2/19/99	10:36:01AM
BR02	10				x		2/19/99	10:55:33AM
BR02	11	x					2/19/99	11:16:49AM
BR02	12				x		2/19/99	11:28:44AM
BR02	13						2/19/99	10:14:40AM
BR02	14						2/19/99	09:06:04AM
BR02	15						2/19/99	09:25:47AM
BR02	16						2/19/99	01:12:52PM
BR02	17			x			2/19/99	01:43:26PM
BR02	18			x			2/19/99	01:51:03PM
BR02	19						2/19/99	09:53:02AM
BR02	20						2/19/99	09:50:57AM
BR02	21						2/19/99	11:58:17AM
BR02	22						2/19/99	12:54:44PM
BR02	23	x					2/19/99	12:45:48PM
BR02	24						2/19/99	01:05:47PM
BR03A	1						2/22/99	12:41:02PM
BR03A	2						2/22/99	12:51:53PM
BR03A	3						2/22/99	02:42:20PM
BR03A	4						2/22/99	02:35:45PM
BR03A	5						2/22/99	02:28:25PM
BR03A	6						2/22/99	01:00:20PM
BR03A	7						2/22/99	01:10:48PM
BR03A	8			x			2/22/99	01:22:16PM
BR03A	9	x					2/22/99	01:33:26PM
BR03A	10						2/22/99	01:37:51PM
BR03A	11	x					2/22/99	01:42:58PM
BR03A	12	x					2/22/99	02:17:41PM
BR03A	13						2/22/99	02:10:39PM
BR03A	14	x					2/22/99	01:57:57PM
BR03A	15						2/22/99	09:34:26AM
BR03A	16	x					2/22/99	09:10:12AM
BR03A	17	x					2/22/99	09:53:16AM
BR03A	18	x					2/22/99	10:11:01AM
BR03A	19	x					2/22/99	10:23:48AM
BR03A	20	x					2/22/99	10:56:03AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR03A	21						2/22/99	12:33:02PM
BR03A	22	x		x			2/22/99	11:38:24AM
BR03A	23	x					2/22/99	11:48:15AM
BR03A	24	x					2/22/99	11:58:49AM
BR03A	25						2/22/99	11:23:55AM
BR03A	26			x			2/22/99	12:08:31PM
BR03B	1	x					2/18/99	09:52:37AM
BR03B	2	x					2/18/99	09:28:50AM
BR03B	3	x					2/18/99	09:09:35AM
BR03B	4	x					2/18/99	08:50:12AM
BR03B	5	x					2/18/99	09:19:28AM
BR03B	6			x			2/18/99	09:47:49AM
BR03B	7	x					2/18/99	10:15:32AM
BR03B	8						2/18/99	10:50:05AM
BR03B	9						2/18/99	10:38:54AM
BR03B	10						2/18/99	10:30:12AM
BR03B	11						2/18/99	10:52:52AM
BR03B	12			x			2/18/99	11:08:22AM
BR03B	13						2/18/99	11:22:31AM
BR03B	14						2/18/99	11:32:23AM
BR03B	15						2/18/99	11:55:42AM
BR03B	16			x			2/18/99	11:38:24AM
BR03B	17						2/18/99	12:03:47PM
BR03B	18						2/18/99	12:50:02PM
BR03B	19	x					2/18/99	02:06:48PM
BR03B	20	x					2/18/99	01:55:18PM
BR03B	21						2/18/99	01:46:37PM
BR03B	22	x					2/18/99	01:38:17PM
BR03B	23	x					2/18/99	01:34:04PM
BR03B	24	x					2/18/99	01:23:54PM
BR03B	25	x					2/18/99	01:15:13PM
BR03B	26						2/18/99	12:59:05PM
BR05	1						2/18/99	02:51:17PM
BR05	2						2/18/99	03:00:48PM
BR05	3	x					2/18/99	03:15:27PM
BR05	4						2/18/99	03:42:40PM
BR05	5						2/18/99	02:40:45PM
BR05	6						2/18/99	03:04:09PM
BR05	7	x					2/18/99	02:31:49PM
BR05	8						2/18/99	02:41:28PM
BR05	9	x					2/18/99	02:29:43PM
BR05	10	x					2/18/99	03:28:27PM
BR05	11	x					2/18/99	04:09:42PM
BR05	12						2/18/99	03:58:18PM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR05	13						2/18/99	03:47:38PM
BR05	14	x					2/18/99	03:59:38PM
BR05	15						2/18/99	03:07:58PM
BR05	16	x					2/18/99	02:04:53PM
BR05	17						2/18/99	01:32:07PM
BR05	18	x					2/18/99	01:13:35PM
BR05	19	x					2/18/99	12:58:28PM
BR05	20	x					2/18/99	12:34:43PM
BR05	21	x					2/18/99	03:28:42PM
BR05	22	x					2/18/99	03:36:26PM
BR06	1						2/19/99	11:43:51AM
BR06	2						2/19/99	12:23:37PM
BR06	3						2/19/99	12:33:15PM
BR06	4	x					2/19/99	12:46:16PM
BR06	5				x		2/19/99	12:59:12PM
BR06	6				x		2/19/99	01:08:36PM
BR06	7	x					2/19/99	01:20:49PM
BR06	8						2/19/99	01:27:54PM
BR06	9	x					2/19/99	01:35:25PM
BR06	10	x					2/19/99	01:47:20PM
BR06	11	x					2/19/99	01:52:46PM
BR06	12	x					2/19/99	01:58:38PM
BR06	13						2/19/99	12:07:32PM
BR06	14						2/19/99	11:23:02AM
BR06	15						2/19/99	10:13:52AM
BR06	16	x					2/19/99	09:33:16AM
BR06	17						2/19/99	09:47:24AM
BR06	18	x					2/19/99	09:54:10AM
BR06	19	x					2/19/99	10:23:52AM
BR06	20	x					2/19/99	10:33:46AM
BR06	21	x					2/19/99	10:45:52AM
BR06	22	x					2/19/99	11:03:34AM
BR06	23	x					2/19/99	11:13:41AM
BR06	24						2/19/99	12:01:06PM
BR06	25	x					2/19/99	11:30:19AM
BR06	26			x			2/19/99	11:55:32AM
BR10	1	x			x		2/24/99	12:48:42PM
BR10	2						2/24/99	01:24:24PM
BR10	3						2/24/99	01:28:59PM
BR10	4	x					2/25/99	08:33:51AM
BR10	5		x				2/24/99	01:05:02PM
BR10	6	x		x	x		2/24/99	12:58:23PM
BR10	7	x					2/24/99	01:19:51PM
BR10	8				x		2/24/99	01:12:59PM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR10	9	x					2/25/99	10:03:31AM
BR10	10	x					2/25/99	09:56:28AM
BR10	11	x					2/25/99	09:49:21AM
BR10	12	x					2/25/99	09:21:55AM
BR10	13	x					2/25/99	09:13:17AM
BR10	14	x					2/25/99	09:06:53AM
BR10	15	x					2/25/99	09:28:47AM
BR10	16	x					2/25/99	09:34:13AM
BR10	17	x					2/25/99	09:41:10AM
BR10	18	x					2/25/99	08:58:39AM
BR10	19						2/25/99	08:53:35AM
BR10	20	x					2/25/99	08:46:19AM
BR10	21	x					2/24/99	12:39:26PM
BR10	22	x	x				2/24/99	12:28:23PM
BR12	1						2/19/99	08:52:30AM
BR12	2	x					2/19/99	08:59:09AM
BR12	3						2/19/99	09:23:49AM
BR12	4						2/19/99	09:19:59AM
BR12	5						2/19/99	09:15:23AM
BR12	6						2/19/99	09:32:02AM
BR12	7						2/19/99	09:36:02AM
BR12	8						2/19/99	09:47:16AM
BR12	9			x			2/19/99	09:41:49AM
BR12	10			x			2/19/99	10:03:01AM
BR12	11			x			2/19/99	09:53:08AM
BR12	12						2/19/99	10:40:04AM
BR12	13						2/19/99	10:13:53AM
BR12	14						2/19/99	10:19:25AM
BR12	15						2/19/99	10:24:02AM
BR12	16	x					2/19/99	09:08:09AM
BR12	17						2/19/99	09:02:54AM
BR12	18						2/19/99	09:27:10AM
BR12	19	x					2/19/99	11:10:37AM
BR12	20	x					2/19/99	11:30:18AM
BR12	21						2/19/99	11:38:57AM
BR12	22	x					2/19/99	11:42:54AM
BR12	23						2/19/99	11:50:23AM
BR12	24			x			2/19/99	11:55:25AM
BR12	25						2/19/99	12:01:12PM
BR12	26			x			2/19/99	12:08:06PM
BR12	27						2/19/99	12:15:04PM
FC02	1	x					2/24/99	09:00:15AM
FC02	2	x					2/24/99	09:10:26AM
FC02	3	x					2/24/99	09:20:13AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC02	4						2/24/99	08:53:32AM
FC02	5						2/24/99	09:49:33AM
FC02	6						2/24/99	09:35:38AM
FC02	7						2/24/99	09:41:45AM
FC02	8	x		x			2/24/99	09:56:24AM
FC02	9						2/24/99	10:31:34AM
FC02	10						2/24/99	11:23:32AM
FC02	11	x					2/24/99	10:40:30AM
FC02	12						2/24/99	10:48:21AM
FC02	13	x					2/24/99	12:33:34PM
FC02	14						2/24/99	12:28:41PM
FC02	15	x					2/24/99	11:51:57AM
FC02	16	x					2/24/99	11:39:06AM
FC02	17	x					2/24/99	01:33:02PM
FC02	18	x					2/24/99	01:23:15PM
FC02	19	x					2/24/99	01:15:43PM
FC02	20	x		x			2/24/99	12:59:19PM
FC02	21	x					2/24/99	01:05:29PM
FC02	22	x					2/24/99	12:47:37PM
FC02	23	x					2/24/99	10:08:01AM
FC02	24						2/24/99	11:00:08AM
FC02	25	x					2/24/99	10:21:46AM
FC02	26						2/24/99	10:53:28AM
FC03	1						2/23/99	09:58:23AM
FC03	2						2/23/99	10:12:57AM
FC03	3	x					2/23/99	10:30:53AM
FC03	4						2/23/99	10:22:13AM
FC03	5	x					2/23/99	11:10:18AM
FC03	6				x		2/23/99	12:33:06PM
FC03	7						2/23/99	12:40:34PM
FC03	8						2/23/99	12:45:33PM
FC03	9						2/23/99	12:52:23PM
FC03	10						2/23/99	12:57:19PM
FC03	11	x					2/23/99	01:31:03PM
FC03	12	x					2/23/99	01:03:14PM
FC03	13	x					2/23/99	12:03:59PM
FC03	14	x					2/23/99	11:45:44AM
FC03	15	x					2/23/99	11:36:17AM
FC03	16	x					2/23/99	11:28:45AM
FC03	17						2/23/99	11:21:57AM
FC03	18	x					2/23/99	01:12:50PM
FC03	19	x					2/23/99	09:32:00AM
FC03	20	x					2/23/99	09:46:31AM
FC03	21	x					2/23/99	10:06:18AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC03	22	x					2/23/99	10:40:06AM
FC03	23	x					2/23/99	10:51:38AM
FC03	24	x					2/23/99	11:00:39AM
FC05	1	x					2/25/99	10:25:20AM
FC05	2						2/25/99	10:19:12AM
FC05	3	x					2/25/99	10:10:15AM
FC05	4	x					2/25/99	10:02:51AM
FC05	5	x					2/25/99	09:52:49AM
FC05	6	x					2/25/99	09:44:29AM
FC05	7						2/25/99	09:23:51AM
FC05	8	x					2/25/99	09:16:02AM
FC05	9	x					2/25/99	09:04:54AM
FC05	10	x					2/25/99	08:51:42AM
FC05	11	x					2/25/99	08:40:56AM
FC05	12	x					2/25/99	09:30:09AM
FC08	1	x					3/1/99	10:37:58AM
FC08	2	x					3/1/99	09:26:10AM
FC08	3	x					3/1/99	09:17:05AM
FC08	4	x					3/1/99	09:10:12AM
FC08	5	x					3/1/99	09:03:03AM
FC08	6				x		3/1/99	08:50:00AM
FC08	7	x					2/26/99	11:47:18AM
FC08	8						2/26/99	11:40:30AM
FC08	9	x					2/26/99	11:34:03AM
FC08	10	x					2/26/99	11:12:09AM
FC08	11	x					2/26/99	10:28:26AM
FC08	12	x					2/26/99	11:20:36AM
FC08	13						3/1/99	10:03:11AM
FC08	14	x					3/1/99	09:55:44AM
FC08	15						3/1/99	10:13:53AM
FC08	16						3/1/99	10:26:04AM
FC08	17						3/1/99	10:31:43AM
FC08	18	x					3/1/99	09:37:57AM
FC08	19	x					3/1/99	09:31:25AM
FC08	20	x					3/1/99	09:45:54AM
FC10	1						2/25/99	11:40:33AM
FC10	2	x					2/25/99	11:26:56AM
FC10	3	x					2/25/99	12:22:15PM
FC10	4	x					2/25/99	12:12:10PM
FC10	5	x					2/25/99	01:07:38PM
FC10	6	x					2/25/99	01:21:00PM
FC10	7	x					2/25/99	12:58:34PM
FC10	8	x					2/25/99	01:42:55PM
FC10	9	x					2/26/99	07:36:17AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC10	10						2/26/99	07:48:52AM
FC10	11	x					2/26/99	07:58:34AM
FC10	12	x					2/26/99	08:04:25AM
FC10	13	x					2/26/99	08:11:23AM
FC10	14	x					2/26/99	08:30:07AM
FC10	15	x					2/26/99	08:41:58AM
FC10	16	x					2/26/99	08:24:13AM
FC10	17	x					2/26/99	09:49:25AM
FC10	18	x					2/26/99	10:02:57AM
FC10	19	x					2/26/99	09:56:32AM
FC10	20	x					2/26/99	09:28:16AM
FC10	21	x					2/26/99	08:58:56AM
FC10	22	x					2/26/99	09:06:19AM
FC10	23						2/26/99	10:15:10AM
FC10	24						2/25/99	10:48:35AM
FC10	25				x		2/25/99	11:50:45AM
FC10	26	x					2/26/99	09:37:34AM
FC10	27	x					2/26/99	09:20:56AM
FC10	28	x					2/26/99	09:14:47AM
FC10	29	x					2/26/99	08:52:21AM
FC10	30	x					2/26/99	08:18:28AM
FC10	31	x					2/25/99	01:32:09PM
FC10	32	x					2/25/99	11:16:10AM
FC10	33	x					2/25/99	11:03:19AM
FC10	34	x	x				2/25/99	10:56:28AM
LG01	1						2/22/99	09:55:30AM
LG01	2						2/22/99	10:00:44AM
LG01	3						2/22/99	10:06:34AM
LG01	4						2/22/99	10:13:25AM
LG01	5						2/22/99	10:21:37AM
LG01	6						2/22/99	10:27:22AM
LG01	7		x	x			2/22/99	10:34:36AM
LG01	8						2/22/99	11:07:37AM
LG01	9						2/22/99	11:01:59AM
LG01	10	x					2/22/99	10:46:37AM
LG01	11	x					2/22/99	10:55:58AM
LG01	12	x					2/22/99	09:46:39AM
LG01	13	x	x				2/22/99	09:37:35AM
LG01	14	x					2/22/99	09:27:23AM
LG01	15	x					2/22/99	08:45:57AM
LG01	16	x					2/22/99	08:56:36AM
LG01	17	x					2/22/99	09:10:51AM
LG01	18						2/22/99	09:17:35AM
LG01	19						2/22/99	11:53:37AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG01	20	x					2/22/99	12:03:50PM
LG01	21	x					2/22/99	12:11:49PM
LG01	22	x					2/22/99	12:19:50PM
LG01	23				x		2/22/99	11:22:23AM
LG01	24	x					2/22/99	11:29:24AM
LG01	25	x					2/22/99	11:38:30AM
LG01	26						2/22/99	12:26:52PM
LG02	1						2/23/99	11:51:08AM
LG02	2	x		x			2/23/99	11:39:06AM
LG02	3						2/23/99	11:12:42AM
LG02	4	x					2/23/99	11:31:03AM
LG02	5			x			2/23/99	11:24:24AM
LG02	6	x		x			2/23/99	11:00:11AM
LG02	7	x					2/23/99	10:46:30AM
LG02	8		x				2/23/99	10:35:26AM
LG02	9		x				2/23/99	10:20:58AM
LG02	10	x	x				2/23/99	10:10:16AM
LG02	11	x	x				2/23/99	09:57:21AM
LG02	12	x		x			2/23/99	09:39:22AM
LG02	13	x		x			2/23/99	09:25:38AM
LG02	14						2/23/99	09:09:34AM
LG02	15						2/23/99	09:18:03AM
LG02	16						2/23/99	08:54:15AM
LG02	17			x			2/23/99	01:28:58PM
LG02	18						2/23/99	01:25:06PM
LG02	19	x		x			2/23/99	12:55:58PM
LG02	20	x					2/23/99	01:02:51PM
LG02	21	x		x			2/23/99	01:14:37PM
LG02	22	x		x			2/23/99	12:46:56PM
LG02	23	x					2/23/99	12:00:02PM
LG02	24	x					2/23/99	12:09:52PM
LG02	25			x			2/23/99	12:16:58PM
LG02	26						2/23/99	12:24:06PM
LG02	27	x					3/3/99	11:33:03AM
LG02	28	x					3/3/99	11:43:54AM
LG02	29	x					3/3/99	11:49:45AM
LG02	30	x					3/3/99	11:56:39AM
LG02	31	x					3/3/99	12:03:12PM
LG03	1	x	x				2/26/99	09:13:21AM
LG03	2		x				2/26/99	09:18:51AM
LG03	7	x					2/26/99	08:12:10AM
LG03	9	x	x				2/26/99	08:32:38AM
LG03	10						2/26/99	08:09:01AM
LG03	12	x	x	x			2/26/99	08:21:39AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG03	13	x	x				2/26/99	08:02:54AM
LG03	14						2/26/99	07:59:12AM
LG03	15	x	x				2/26/99	07:52:50AM
LG03	16		x				2/26/99	07:40:10AM
LG03	17	x					2/26/99	07:46:13AM
LG03	18		x				2/26/99	07:26:25AM
LG03	19		x				2/26/99	09:03:38AM
LG03	20	x					2/26/99	10:06:40AM
LG03	21	x					2/26/99	09:56:30AM
LG03	22	x					2/26/99	10:01:55AM
LG03	23		x				2/26/99	09:25:16AM
LG03	24	x	x				2/26/99	09:31:10AM
LG03	25		x				2/26/99	09:42:04AM
LG03	26	x					2/26/99	09:48:29AM
LG04	1	x		x			2/23/99	12:01:39PM
LG04	2	x		x			2/23/99	12:42:47PM
LG04	3	x		x			2/23/99	12:50:11PM
LG04	4			x			2/23/99	12:57:20PM
LG04	5	x		x			2/23/99	01:22:04PM
LG04	6	x					2/23/99	01:15:20PM
LG04	7	x		x	x		2/23/99	01:33:58PM
LG04	8			x			2/23/99	01:06:20PM
LG04	9	x					2/23/99	10:06:59AM
LG04	10		x				2/23/99	10:17:49AM
LG04	11	x		x			2/23/99	11:08:36AM
LG04	12	x	x	x	x		2/23/99	11:00:40AM
LG04	13	x		x	x		2/23/99	10:54:31AM
LG04	14	x		x			2/23/99	10:47:54AM
LG04	15			x			2/23/99	10:35:45AM
LG04	16			x			2/23/99	11:35:23AM
LG04	17			x			2/23/99	09:54:48AM
LG04	18	x		x	x		2/23/99	09:43:40AM
LG04	19						2/23/99	09:39:15AM
LG04	20	x		x			2/23/99	09:27:20AM
LG04	21	x		x			2/23/99	10:27:06AM
LG04	22						2/23/99	11:28:35AM
LG04	23	x		x	x		2/23/99	11:16:34AM
LG04	24	x		x	x		2/23/99	11:22:25AM
LG04	25						2/23/99	11:48:52AM
LG04	26	x					2/23/99	11:52:56AM
LG05	1	x					2/24/99	11:03:09AM
LG05	2	x		x	x		2/24/99	10:54:00AM
LG05	3						2/24/99	10:51:09AM
LG05	4				x		2/24/99	10:36:16AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG05	5						2/24/99	10:44:24AM
LG05	6	x					2/24/99	10:27:39AM
LG05	7	x					2/24/99	10:15:47AM
LG05	8						2/24/99	10:21:30AM
LG05	9	x	x				2/24/99	09:59:05AM
LG05	10	x					2/24/99	10:07:47AM
LG05	11	x					2/24/99	09:41:40AM
LG05	12	x					2/24/99	08:41:26AM
LG05	13	x					2/24/99	09:06:20AM
LG05	14	x		x			2/24/99	09:15:16AM
LG05	15	x					2/24/99	09:24:31AM
LG05	16	x	x				2/24/99	08:54:07AM
LG05	17	x	x				2/24/99	09:52:36AM
LG05	18			x	x		2/24/99	09:35:27AM
LG05	19	x			x		01990224	11:18:33AM
LG06	1	x					2/22/99	12:50:45PM
LG06	2						2/22/99	12:54:37PM
LG06	3			x			2/22/99	01:01:13PM
LG06	4	x					2/22/99	01:11:53PM
LG06	5						2/22/99	01:25:43PM
LG06	6						2/22/99	01:38:57PM
LG06	7				x		2/22/99	01:46:13PM
LG06	8		x		x		2/22/99	01:58:43PM
LG06	9		x				2/22/99	02:07:29PM
LG06	10			x			2/22/99	02:21:36PM
LG06	11		x				2/22/99	11:53:40AM
LG06	12			x			2/22/99	10:40:04AM
LG06	13						2/22/99	10:45:37AM
LG06	14	x					2/22/99	10:58:32AM
LG06	15	x					2/22/99	11:14:58AM
LG06	16		x				2/22/99	11:03:14AM
LG06	17	x					2/22/99	08:53:45AM
LG06	18	x					2/22/99	09:15:15AM
LG06	19	x		x			2/22/99	09:40:46AM
LG06	20	x	x	x			2/22/99	09:34:13AM
LG06	21	x					2/22/99	09:55:25AM
LG06	22						2/22/99	10:03:54AM
LG06	23						2/22/99	09:25:04AM
LG06	24	x		x			2/22/99	10:23:30AM
LG06	25	x					2/22/99	12:01:48PM
LG06	26						2/22/99	12:10:19PM
LG06	27	x					3/3/99	08:28:37AM
LG06	28	x	x				3/3/99	08:37:18AM
LG06	29	x	x				3/3/99	08:46:23AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG06	30	x	x				3/3/99	08:55:28AM
LG08	1	x					2/18/99	12:52:10PM
LG08	2	x					2/18/99	12:38:16PM
LG08	3						2/18/99	12:28:20PM
LG08	4						2/18/99	12:23:39PM
LG08	5						2/18/99	12:16:18PM
LG08	6	x					2/18/99	11:53:12AM
LG08	7	x					2/18/99	12:05:29PM
LG08	8						2/18/99	11:44:43AM
LG08	9						2/18/99	11:35:16AM
LG08	10	x					2/18/99	11:23:56AM
LG08	11	x					2/18/99	11:11:03AM
LG08	12	x					2/18/99	10:56:46AM
LG08	13	x					2/18/99	10:42:04AM
LG08	14	x					2/18/99	10:29:16AM
LG08	15	x					2/18/99	09:59:22AM
LG08	16						2/18/99	10:17:51AM
LG08	17	x					2/18/99	10:08:25AM
LG08	18						2/18/99	09:49:36AM
LG08	19						2/18/99	09:42:14AM
LG08	20						2/18/99	09:34:55AM
LG08	21	x					2/18/99	09:24:07AM
LG08	22						2/18/99	09:15:40AM
LG08	23						2/18/99	09:07:57AM
LG08	24						2/18/99	09:00:36AM
LG08	25						2/18/99	08:52:03AM
LG08	26						2/18/99	08:41:52AM
LG09	1				x		2/25/99	11:37:51AM
LG09	2	x	x				2/25/99	11:29:44AM
LG09	3	x					2/25/99	11:18:52AM
LG09	4	x					2/25/99	11:24:01AM
LG09	5	x					2/25/99	11:08:55AM
LG09	6		x				2/25/99	11:45:34AM
LG09	7	x	x				2/25/99	12:31:58PM
LG09	8	x					2/25/99	12:37:53PM
LG09	9	x					2/25/99	12:55:01PM
LG09	10			x			2/25/99	01:19:11PM
LG09	11					x	2/25/99	01:22:57PM
LG09	12	x					2/25/99	01:27:49PM
LG09	13	x					2/25/99	01:32:41PM
LG09	14	x					2/25/99	02:02:13PM
LG09	15	x					2/25/99	01:56:03PM
LG09	16	x				x	2/25/99	01:48:09PM
LG09	17	x					2/25/99	01:14:10PM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG09	18						2/25/99	10:31:55AM
LG09	19	x					2/25/99	10:47:41AM
LG09	20	x					2/25/99	10:40:27AM
LG09	21	x	x				2/25/99	10:52:42AM
LG09	22		x				2/25/99	10:59:13AM
LG09	23						2/25/99	11:03:45AM
LG09	24		x				2/25/99	12:21:29PM
LG09	25	x					2/25/99	12:47:56PM
LG09	26	x				x	2/25/99	12:59:48PM
LG14	1	x					2/25/99	11:41:16AM
LG14	2	x					2/25/99	11:12:51AM
LG14	3	x		x			2/25/99	10:46:03AM
LG14	4				x		2/25/99	08:47:27AM
LG14	5	x		x			2/25/99	08:54:46AM
LG14	6	x		x			2/25/99	09:01:47AM
LG14	7				x		2/25/99	09:07:07AM
LG14	8						2/25/99	09:12:21AM
LG14	9				x		2/25/99	09:24:14AM
LG14	10	x					2/25/99	09:32:14AM
LG14	11						2/25/99	09:39:05AM
LG14	12	x					2/25/99	10:03:58AM
LG14	13	x					2/25/99	10:11:37AM
LG14	14	x		x			2/25/99	10:56:55AM
LG14	15	x					2/25/99	11:02:42AM
LG14	16						2/25/99	11:20:09AM
LG14	17	x					2/25/99	11:26:54AM
LG14	18	x					2/25/99	09:48:19AM
LG14	19	x					2/25/99	09:55:12AM
LG14	20	x		x			2/25/99	10:20:32AM
LG14	21						2/25/99	10:38:53AM
LG14	22						2/25/99	11:08:17AM
LG14	23	x					2/25/99	10:29:02AM
LG14	24						2/25/99	09:44:40AM
LG14	25						2/25/99	09:15:53AM
LG14	26	x					2/25/99	11:31:58AM
LG15	1						2/23/99	02:05:45PM
LG15	2						2/23/99	01:56:01PM
LG15	3	x					2/23/99	01:58:40PM
MC02	1	x					3/1/99	11:07:44AM
MC02	2	x					3/1/99	11:16:47AM
MC02	3	x					3/1/99	11:52:29AM
MC02	4	x					3/1/99	12:25:32PM
MC02	5	x					3/1/99	12:32:44PM
MC02	6	x					3/1/99	12:49:07PM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC02	7	x					3/1/99	01:06:52PM
MC02	8		x				3/1/99	01:14:53PM
MC02	9	x					3/2/99	09:08:31AM
MC02	10						3/2/99	09:01:36AM
MC02	11	x					3/2/99	08:36:39AM
MC02	12	x					3/2/99	09:49:18AM
MC02	13	x					3/2/99	09:58:15AM
MC02	14						3/2/99	10:15:56AM
MC02	15	x					3/2/99	12:58:41PM
MC02	16	x					3/2/99	12:12:02PM
MC02	17	x					3/2/99	12:24:45PM
MC02	18	x					3/2/99	12:46:15PM
MC02	19	x					3/2/99	11:45:07AM
MC02	20	x					3/2/99	10:06:08AM
MC02	21	x					3/2/99	09:36:55AM
MC02	22	x	x				3/2/99	09:29:36AM
MC02	23	x					3/1/99	01:21:05PM
MC02	24	x					3/1/99	11:39:19AM
MC02	25	x					3/1/99	11:45:55AM
MC02	26	x					3/1/99	11:22:46AM
MC02	27	x					3/1/99	11:30:57AM
MC02	28	x					3/1/99	12:40:46PM
MC02	29	x					3/1/99	12:59:18PM
MC02	30	x					3/2/99	09:22:23AM
MC02	31	x					3/1/99	01:32:53PM
MC02	32				x		3/2/99	08:51:29AM
MC02	33	x					3/2/99	10:22:44AM
MC02	34	x					3/2/99	10:33:45AM
MC02	35	x					3/2/99	11:54:25AM
MC02	36	x					3/2/99	12:02:58PM
MC02	37	x	x				3/2/99	12:34:02PM
MC02	38		x				3/2/99	12:41:04PM
MC02	39	x	x				3/2/99	12:19:28PM
MC03	1	x					3/3/99	11:45:32AM
MC03	2	x	x				3/3/99	11:40:23AM
MC03	3	x	x				3/3/99	11:36:04AM
MC03	4	x					3/3/99	11:31:45AM
MC03	5	x					3/3/99	11:26:51AM
MC03	6						3/3/99	11:00:53AM
MC03	7	x	x				3/3/99	10:54:06AM
MC03	8	x					3/3/99	11:07:18AM
MC03	9				x		3/3/99	11:12:48AM
MC03	10	x					3/3/99	11:17:39AM
MC03	11	x					3/3/99	11:53:32AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC03	12	x					3/3/99	12:13:56PM
MC03	13	x					3/3/99	12:07:14PM
MC03	14	x					3/3/99	12:00:56PM
MC03	15	x					3/3/99	12:19:33PM
MC03	16	x					3/3/99	10:47:10AM
MC03	17				x		3/3/99	10:40:46AM
MC03	18	x					3/3/99	10:28:25AM
MC03	19						3/3/99	08:53:50AM
MC03	20				x		3/3/99	08:47:28AM
MC03	21						3/3/99	08:45:26AM
MC03	22	x					3/3/99	08:39:28AM
MC03	23	x					3/3/99	08:28:21AM
MC03	24	x					3/3/99	07:53:03AM
MC03	25	x					3/3/99	08:01:42AM
MC03	26						3/3/99	08:14:15AM
MC05	1						3/3/99	10:17:28AM
MC05	2	x					3/3/99	09:59:30AM
MC05	3						3/3/99	09:52:01AM
MC05	4	x					3/3/99	10:09:04AM
MC05	5	x					3/3/99	09:24:32AM
MC05	6						3/3/99	09:11:58AM
MC05	7						3/3/99	09:39:36AM
MC05	8						3/3/99	08:35:34AM
MC05	9	x					3/3/99	08:04:05AM
MC05	10	x					3/3/99	08:23:25AM
MC05	11	x					3/3/99	07:54:15AM
MC05	12						3/3/99	08:27:48AM
MC05	13	x					3/2/99	01:25:17PM
MC05	14						3/2/99	01:14:44PM
MC05	15	x					3/3/99	08:59:57AM
MC05	16	x					3/3/99	08:49:18AM
MC05	17						3/2/99	01:33:40PM
MC06	1	x					3/1/99	12:15:04PM
MC06	2						3/1/99	12:04:58PM
MC06	3						3/1/99	11:58:37AM
MC06	4						3/1/99	11:23:47AM
MC06	5						3/1/99	11:21:08AM
MC06	6	x					3/1/99	11:01:56AM
MC06	7	x					3/1/99	11:07:26AM
MC06	8	x					3/1/99	10:53:44AM
MC06	9						3/1/99	10:46:58AM
MC06	10	x					3/1/99	10:32:21AM
MC06	11						3/1/99	10:38:14AM
MC06	12	x					3/1/99	10:07:30AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC06	13	x					3/1/99	10:00:12AM
MC06	14						3/1/99	09:54:28AM
MC06	15						3/1/99	09:47:43AM
MC06	16	x					3/1/99	09:31:54AM
MC06	17	x					3/1/99	09:20:38AM
MC06	18	x					3/1/99	09:13:41AM
MC06	19	x					3/1/99	09:06:37AM
MC06	20		x				3/1/99	08:56:16AM
MC06	21				x		3/1/99	12:32:52PM
MC06	22	x			x		3/1/99	12:51:26PM
MC06	23				x		3/1/99	12:39:28PM
MC06	24	x					3/1/99	10:21:16AM
MC06	25						3/1/99	10:13:59AM
MC06	26	x					3/1/99	09:39:26AM
MC07	1						3/2/99	09:31:01AM
MC07	2						3/2/99	09:35:15AM
MC07	3	x	x				3/2/99	09:41:53AM
MC07	4	x					3/2/99	09:49:51AM
MC07	5						3/2/99	10:06:23AM
MC07	6	x					3/2/99	10:14:08AM
MC07	7	x					3/2/99	10:36:40AM
MC07	8	x					3/2/99	10:47:26AM
MC07	9	x					3/2/99	10:56:54AM
MC07	10	x					3/2/99	11:48:20AM
MC07	11		x				3/2/99	08:50:23AM
MC07	12						3/2/99	08:59:00AM
MC07	13	x					3/2/99	09:58:36AM
MC07	14						3/2/99	11:54:36AM
MC07	15	x	x				3/2/99	12:11:55PM
MC07	16	x					3/2/99	12:20:15PM
MC07	17						3/2/99	01:04:52PM
MC07	18	x					3/2/99	12:58:07PM
MC07	19						3/2/99	12:53:55PM
MC07	20	x					3/2/99	12:35:14PM
MC07	21	x					3/2/99	12:28:47PM
MC07	22						3/2/99	12:14:42PM
MC07	23						3/2/99	12:01:23PM
MC07	24						3/2/99	11:34:47AM
MC07	25						3/2/99	09:05:53AM
MC07	26	x					3/2/99	09:22:16AM
YL01	1	x					2/26/99	11:02:55AM
YL01	2						2/26/99	10:57:35AM
YL01	3	x	x				2/26/99	10:49:45AM
YL01	4		x				2/26/99	10:45:04AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
YL01	5	x					2/26/99	10:32:37AM
YL01	6	x					2/26/99	10:21:58AM
YL01	7	x					2/26/99	10:13:34AM
YL01	8	x					2/26/99	10:07:43AM
YL01	9	x					2/26/99	10:01:01AM
YL01	10	x					2/26/99	09:37:52AM
YL01	11	x					2/26/99	09:30:38AM
YL01	12	x					2/26/99	09:43:37AM
YL01	13	x			x		2/26/99	09:53:21AM
YL01	14	x					2/26/99	09:25:45AM
YL01	15	x			x		2/26/99	09:21:10AM
YL01	16	x					2/26/99	09:13:59AM
YL01	17	x					2/26/99	08:13:40AM
YL01	18	x					2/26/99	08:08:43AM
YL01	19	x					2/26/99	08:03:05AM
YL01	20	x					2/26/99	07:34:35AM
YL01	21	x					2/26/99	07:57:33AM
YL01	22	x					2/26/99	07:52:35AM
YL01	23	x					2/26/99	07:45:43AM
YL01	24						2/26/99	11:33:24AM
YL01	25	x					2/26/99	11:25:32AM
YL01	26				x		2/26/99	11:12:51AM
YL02	1						2/24/99	10:51:18AM
YL02	2	x					2/24/99	10:43:34AM
YL02	3	x					2/24/99	10:36:22AM
YL02	4	x					2/24/99	10:40:29AM
YL02	5						2/24/99	10:33:08AM
YL02	6	x					2/24/99	10:09:50AM
YL02	7	x					2/24/99	09:57:09AM
YL02	8	x					2/24/99	09:53:15AM
YL02	9						2/24/99	09:50:02AM
YL02	10	x					2/24/99	09:08:48AM
YL02	11						2/24/99	09:13:21AM
YL02	12						2/24/99	09:02:23AM
YL02	13						2/24/99	08:59:15AM
YL02	14						2/24/99	08:37:32AM
YL02	15						2/24/99	08:48:35AM
YL02	16						2/24/99	08:53:05AM
YL02	17	x					2/24/99	09:23:51AM
YL02	18	x					2/24/99	09:18:53AM
YL02	19	x					2/24/99	09:30:55AM
YL02	20	x					2/24/99	09:39:16AM
YL02	21	x					2/24/99	10:16:25AM
YL02	22						2/24/99	10:28:31AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #2

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
YL02	23	x					2/24/99	10:59:56AM
YL02	24						2/24/99	11:09:46AM
YL02	25				x		2/24/99	11:32:04AM
YL02	26	x					2/24/99	11:42:59AM
YL02	27	x					2/24/99	11:49:05AM
YL02	28						2/24/99	11:58:50AM
YL02	29						2/24/99	12:04:13PM
YL02	30	x					2/24/99	12:08:02PM
YL02	31	x					2/24/99	12:13:00PM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR03B	3						3/4/99	07:43:15AM
BR03B	4						3/4/99	07:36:20AM
BR03B	5						3/4/99	07:49:58AM
BR03B	6	x					3/4/99	08:04:03AM
BR03B	7	x					3/4/99	08:20:14AM
BR03B	8						3/4/99	08:28:53AM
BR03B	9				x		3/4/99	08:35:03AM
BR03B	10						3/4/99	08:39:37AM
BR03B	11	x					3/4/99	08:43:39AM
BR03B	12						3/4/99	08:56:20AM
BR03B	13						3/4/99	08:50:46AM
BR03B	14	x					3/4/99	09:01:53AM
BR03B	15						3/4/99	09:06:59AM
BR03B	16						3/4/99	09:12:37AM
BR03B	17						3/4/99	09:20:23AM
BR03B	18						3/4/99	09:27:00AM
BR03B	19						3/4/99	10:15:49AM
BR03B	20				x		3/4/99	10:06:38AM
BR03B	21						3/4/99	10:00:15AM
BR03B	22						3/4/99	09:54:03AM
BR03B	23						3/4/99	09:58:05AM
BR03B	24						3/4/99	09:47:50AM
BR03B	25						3/4/99	09:43:28AM
BR03B	26	x					3/4/99	09:36:02AM
BR05	1				x		3/4/99	09:40:07AM
BR05	2						3/4/99	09:50:39AM
BR05	3						3/4/99	10:16:37AM
BR05	4						3/4/99	10:25:08AM
BR05	5						3/4/99	09:20:47AM
BR05	6						3/4/99	09:31:42AM
BR05	7						3/4/99	09:09:04AM
BR05	8	x					3/4/99	08:57:56AM
BR05	9	x					3/4/99	08:46:58AM
BR05	10	x					3/4/99	10:00:02AM
BR05	11	x					3/4/99	12:01:18PM
BR05	12				x		3/4/99	11:53:52AM
BR05	13	x					3/4/99	11:14:05AM
BR05	14						3/4/99	10:58:27AM
BR05	15						3/4/99	10:08:52AM
BR05	16	x					3/4/99	08:37:20AM
BR05	17						3/4/99	08:23:55AM
BR05	18						3/4/99	08:12:19AM
BR05	19	x					3/4/99	07:58:43AM
BR05	20						3/4/99	07:47:33AM
BR05	21	x					3/4/99	10:34:33AM
BR05	22	x					3/4/99	10:43:53AM
BR06	1						3/5/99	09:00:11AM
BR06	2						3/5/99	08:39:20AM
BR06	3						3/5/99	08:34:42AM
BR06	4	x					3/5/99	08:29:28AM
BR06	5						3/5/99	08:25:53AM
BR06	6						3/5/99	08:20:59AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR06	7						3/5/99	08:18:50AM
BR06	8						3/5/99	08:13:51AM
BR06	9						3/5/99	08:08:26AM
BR06	10	x					3/5/99	08:01:49AM
BR06	11						3/5/99	07:57:33AM
BR06	12						3/5/99	07:48:31AM
BR06	13				x		3/5/99	08:44:12AM
BR06	14				x		3/5/99	09:08:41AM
BR06	15						3/5/99	09:33:04AM
BR06	16						3/5/99	09:44:31AM
BR06	17						3/5/99	09:39:57AM
BR06	18						3/5/99	09:36:49AM
BR06	19						3/5/99	09:28:29AM
BR06	20						3/5/99	09:25:02AM
BR06	21						3/5/99	09:21:43AM
BR06	22						3/5/99	09:18:56AM
BR06	23						3/5/99	09:16:04AM
BR06	24						3/5/99	08:51:53AM
BR06	25						3/5/99	09:03:53AM
BR06	26	x					3/5/99	08:56:02AM
BR10	1						3/10/99	09:53:09AM
BR10	2						3/10/99	09:38:23AM
BR10	3						3/10/99	09:36:09AM
BR10	4						3/10/99	09:29:49AM
BR10	5						3/10/99	09:46:34AM
BR10	6						3/10/99	09:48:01AM
BR10	7						3/10/99	09:41:43AM
BR10	8						3/10/99	09:43:05AM
BR10	9						3/10/99	08:45:59AM
BR10	10						3/10/99	08:52:00AM
BR10	11						3/10/99	08:55:05AM
BR10	12						3/10/99	09:08:13AM
BR10	13						3/10/99	09:10:03AM
BR10	14						3/10/99	09:11:00AM
BR10	15						3/10/99	09:05:11AM
BR10	16						3/10/99	09:01:17AM
BR10	17						3/10/99	08:59:39AM
BR10	18						3/10/99	09:13:06AM
BR10	19						3/10/99	09:21:04AM
BR10	20						3/10/99	09:23:03AM
BR10	21						3/10/99	09:55:00AM
BR10	22						3/10/99	09:58:19AM
BR12	1						3/5/99	07:59:15AM
BR12	2						3/5/99	08:05:51AM
BR12	3						3/5/99	08:18:54AM
BR12	4						3/5/99	10:12:38AM
BR12	5						3/5/99	08:17:15AM
BR12	6						3/5/99	08:29:44AM
BR12	7						3/5/99	08:36:22AM
BR12	8						3/5/99	08:42:35AM
BR12	9						3/5/99	08:41:03AM
BR12	10						3/5/99	08:51:19AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR12	11	x					3/5/99	08:46:57AM
BR12	12						3/5/99	08:57:40AM
BR12	13						3/5/99	07:47:19AM
BR12	14	x					3/5/99	07:36:26AM
BR12	15						3/5/99	07:43:10AM
BR12	16						3/5/99	08:14:06AM
BR12	17						3/5/99	08:08:15AM
BR12	18						3/5/99	08:21:10AM
BR12	19						3/5/99	09:07:27AM
BR12	20						3/5/99	09:16:34AM
BR12	21				x		3/5/99	09:25:52AM
BR12	22						3/5/99	09:33:19AM
BR12	23	x					3/5/99	09:37:13AM
BR12	24	x					3/5/99	09:44:29AM
BR12	25	x					3/5/99	09:49:06AM
BR12	26						3/5/99	09:56:48AM
BR12	27	x					3/5/99	10:00:37AM
FC02	1						3/10/99	01:00:08PM
FC02	2						3/10/99	12:53:59PM
FC02	3						3/10/99	12:52:52PM
FC02	4						3/10/99	01:03:06PM
FC02	5						3/10/99	12:36:22PM
FC02	6						3/10/99	12:42:13PM
FC02	7						3/10/99	12:39:42PM
FC02	8						3/10/99	12:31:46PM
FC02	9						3/10/99	12:18:51PM
FC02	10						3/10/99	11:29:04AM
FC02	11						3/10/99	12:17:27PM
FC02	12						3/10/99	12:16:03PM
FC02	13						3/10/99	10:53:31AM
FC02	14						3/10/99	10:56:52AM
FC02	15						3/10/99	11:01:02AM
FC02	16						3/10/99	11:04:47AM
FC02	17						3/10/99	10:18:54AM
FC02	18						3/10/99	10:23:36AM
FC02	19						3/10/99	10:30:09AM
FC02	20						3/10/99	10:39:21AM
FC02	21						3/10/99	10:35:36AM
FC02	22						3/10/99	10:43:31AM
FC02	23						3/10/99	11:16:39AM
FC02	24						3/10/99	11:28:02AM
FC02	25						3/10/99	12:26:06PM
FC02	26						3/10/99	11:42:57AM
FC03	1						3/9/99	10:46:58AM
FC03	2						3/9/99	10:31:48AM
FC03	3						3/9/99	10:23:49AM
FC03	4						3/9/99	10:27:22AM
FC03	5						3/9/99	09:55:09AM
FC03	6						3/9/99	09:17:14AM
FC03	7						3/9/99	09:08:01AM
FC03	8						3/9/99	09:03:42AM
FC03	9						3/9/99	08:59:58AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC03	10						3/9/99	08:55:28AM
FC03	11	x					3/9/99	08:46:51AM
FC03	12						3/9/99	08:52:47AM
FC03	13						3/9/99	09:21:14AM
FC03	14						3/9/99	09:34:42AM
FC03	15						3/9/99	09:39:22AM
FC03	16						3/9/99	09:44:42AM
FC03	17						3/9/99	09:49:41AM
FC03	18						3/9/99	08:50:26AM
FC03	19	x					3/9/99	11:08:58AM
FC03	20	x					3/9/99	10:49:32AM
FC03	21	x					3/9/99	10:36:15AM
FC03	22	x		x			3/9/99	10:15:44AM
FC03	23						3/9/99	10:08:04AM
FC03	24						3/9/99	10:04:53AM
FC05	1						3/10/99	08:47:34AM
FC05	2						3/10/99	08:52:33AM
FC05	3						3/10/99	08:56:54AM
FC05	4						3/10/99	08:58:48AM
FC05	5	x					3/10/99	09:09:30AM
FC05	6						3/10/99	09:21:16AM
FC05	7						3/10/99	09:37:40AM
FC05	8						3/10/99	09:40:13AM
FC05	9						3/10/99	09:47:09AM
FC05	10						3/10/99	10:00:04AM
FC05	11						3/10/99	10:02:37AM
FC05	12				x		3/10/99	09:25:30AM
FC08	1				x		3/11/99	01:20:37PM
FC08	2						3/11/99	12:39:17PM
FC08	3						3/11/99	12:32:43PM
FC08	4						3/11/99	12:31:08PM
FC08	5						3/11/99	12:28:08PM
FC08	6	x					3/11/99	12:23:44PM
FC08	7						3/11/99	12:21:03PM
FC08	8						3/11/99	12:14:53PM
FC08	9						3/11/99	12:13:37PM
FC08	10						3/11/99	12:00:15PM
FC08	11						3/11/99	11:57:52AM
FC08	12	x					3/11/99	12:04:21PM
FC08	13						3/11/99	12:52:38PM
FC08	14						3/11/99	12:50:15PM
FC08	15						3/11/99	01:00:23PM
FC08	16						3/11/99	01:13:55PM
FC08	17						3/11/99	01:17:39PM
FC08	18						3/11/99	12:42:45PM
FC08	19						3/11/99	12:44:00PM
FC08	20						3/11/99	12:46:19PM
FC10	1						3/11/99	11:05:23AM
FC10	2						3/11/99	10:57:49AM
FC10	3				x		3/11/99	10:24:21AM
FC10	4	x					3/11/99	10:32:49AM
FC10	5	x					3/11/99	10:05:25AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC10	6	x					3/11/99	09:56:22AM
FC10	7	x					3/11/99	10:30:31AM
FC10	8	x					3/11/99	09:33:07AM
FC10	9	x					3/11/99	09:25:40AM
FC10	10	x					3/11/99	09:20:18AM
FC10	11						3/11/99	09:18:00AM
FC10	12						3/11/99	09:16:54AM
FC10	13						3/11/99	09:05:42AM
FC10	14						3/11/99	08:57:25AM
FC10	15	x					3/11/99	08:50:30AM
FC10	16						3/11/99	09:13:16AM
FC10	17						3/11/99	08:02:54AM
FC10	18	x					3/11/99	07:54:05AM
FC10	19						3/11/99	08:00:53AM
FC10	20						3/11/99	08:10:41AM
FC10	21	x					3/11/99	08:31:49AM
FC10	22	x					3/11/99	08:25:44AM
FC10	23						3/11/99	07:41:50AM
FC10	24						3/11/99	11:11:40AM
FC10	25						3/11/99	11:16:08AM
FC10	26						3/11/99	08:07:59AM
FC10	27	x					3/11/99	08:12:35AM
FC10	28	x					3/11/99	08:18:25AM
FC10	29						3/11/99	08:38:06AM
FC10	30						3/11/99	09:10:01AM
FC10	31				x		3/11/99	09:43:36AM
FC10	32						3/11/99	10:50:59AM
FC10	33				x		3/11/99	10:39:03AM
FC10	34						3/11/99	10:46:08AM
LG01	1						3/8/99	09:32:29AM
LG01	2						3/8/99	09:34:09AM
LG01	3						3/8/99	09:41:48AM
LG01	4						3/8/99	09:47:04AM
LG01	5						3/8/99	09:52:43AM
LG01	6						3/8/99	09:54:22AM
LG01	7						3/8/99	09:58:11AM
LG01	8						3/8/99	10:01:10AM
LG01	9						3/8/99	10:06:51AM
LG01	10	x					3/8/99	10:08:21AM
LG01	11						3/8/99	10:18:36AM
LG01	12						3/8/99	08:49:32AM
LG01	13						3/8/99	08:57:22AM
LG01	14						3/8/99	09:07:03AM
LG01	15						3/8/99	09:16:17AM
LG01	16						3/8/99	09:19:43AM
LG01	17						3/8/99	09:21:29AM
LG01	18						3/8/99	09:24:11AM
LG01	19						3/8/99	10:57:43AM
LG01	20				x		3/8/99	11:00:56AM
LG01	21						3/8/99	11:06:15AM
LG01	22						3/8/99	11:11:50AM
LG01	23	x					3/8/99	10:31:58AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG01	24						3/8/99	10:41:25AM
LG01	25	x					3/8/99	10:48:59AM
LG01	26						3/8/99	10:26:53AM
LG02	1						3/9/99	09:06:45AM
LG02	2						3/10/99	10:35:35AM
LG02	3						3/9/99	09:33:01AM
LG02	4	x					3/9/99	09:14:24AM
LG02	5	x					3/9/99	09:23:50AM
LG02	6	x					3/9/99	09:37:54AM
LG02	7						3/9/99	10:16:29AM
LG02	8						3/9/99	10:20:32AM
LG02	9						3/9/99	10:24:10AM
LG02	10						3/9/99	10:22:22AM
LG02	11						3/9/99	10:25:59AM
LG02	12	x					3/9/99	10:31:41AM
LG02	13						3/9/99	10:36:45AM
LG02	14						3/9/99	10:39:18AM
LG02	15	x					3/9/99	10:47:24AM
LG02	16						3/9/99	10:53:05AM
LG02	17						3/9/99	11:43:58AM
LG02	18						3/9/99	11:40:37AM
LG02	19						3/9/99	11:29:36AM
LG02	20	x					3/9/99	11:30:11AM
LG02	21						3/9/99	11:37:55AM
LG02	22	x					3/9/99	11:19:50AM
LG02	23						3/9/99	11:00:49AM
LG02	24						3/9/99	11:02:42AM
LG02	25						3/9/99	11:04:06AM
LG02	26	x					3/9/99	11:06:08AM
LG02	27						3/9/99	09:50:00AM
LG02	28						3/9/99	09:53:24AM
LG02	29						3/9/99	09:56:16AM
LG02	30						3/9/99	10:03:33AM
LG02	31						3/9/99	10:09:59AM
LG03	1						3/11/99	09:42:37AM
LG03	2						3/11/99	09:43:59AM
LG03	7						3/11/99	09:31:07AM
LG03	9						3/11/99	09:33:10AM
LG03	10						3/11/99	09:27:46AM
LG03	12						3/11/99	09:29:32AM
LG03	13						3/11/99	09:26:08AM
LG03	14						3/11/99	09:24:28AM
LG03	15						3/11/99	09:22:38AM
LG03	16						3/11/99	09:21:28AM
LG03	17						3/11/99	09:19:53AM
LG03	18						3/11/99	09:15:27AM
LG03	19						3/11/99	09:40:37AM
LG03	20						3/11/99	10:02:49AM
LG03	21	x					3/11/99	09:57:45AM
LG03	22						3/11/99	10:06:46AM
LG03	23						3/11/99	09:45:12AM
LG03	24						3/11/99	09:46:32AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG03	25						3/11/99	09:48:36AM
LG03	26						3/11/99	09:50:16AM
LG04	1				x		3/9/99	10:23:39AM
LG04	2	x					3/9/99	10:35:27AM
LG04	3				x		3/9/99	10:42:57AM
LG04	4	x					3/9/99	10:49:23AM
LG04	5				x		3/9/99	11:08:57AM
LG04	6	x					3/9/99	11:00:35AM
LG04	7						3/9/99	10:57:48AM
LG04	8						3/9/99	10:55:01AM
LG04	9						3/9/99	09:02:41AM
LG04	10						3/9/99	09:06:18AM
LG04	11						3/9/99	09:29:00AM
LG04	12						3/9/99	09:20:45AM
LG04	13	x					3/9/99	09:22:12AM
LG04	14						3/9/99	09:17:40AM
LG04	15						3/9/99	09:15:47AM
LG04	16						3/9/99	10:02:49AM
LG04	17						3/9/99	08:58:08AM
LG04	18	x					3/9/99	08:51:39AM
LG04	19	x					3/9/99	08:47:21AM
LG04	20	x					3/9/99	08:37:26AM
LG04	21	x					3/9/99	09:08:06AM
LG04	22	x					3/9/99	09:45:49AM
LG04	23	x					3/9/99	09:34:01AM
LG04	24	x					3/9/99	09:39:49AM
LG04	25	x					3/9/99	10:14:21AM
LG04	26						3/9/99	10:19:49AM
LG05	1						3/10/99	11:19:56AM
LG05	2						3/10/99	11:15:35AM
LG05	3						3/10/99	11:14:32AM
LG05	4						3/10/99	11:11:11AM
LG05	5						3/10/99	11:12:22AM
LG05	6						3/10/99	11:09:14AM
LG05	7						3/10/99	11:02:44AM
LG05	8						3/10/99	11:03:55AM
LG05	9						3/10/99	10:54:38AM
LG05	10						3/10/99	10:59:48AM
LG05	11						3/10/99	10:50:57AM
LG05	12						3/10/99	10:22:17AM
LG05	13						3/10/99	10:34:06AM
LG05	14	x					3/10/99	10:38:53AM
LG05	15						3/10/99	10:44:10AM
LG05	16						3/10/99	10:29:17AM
LG05	17						3/10/99	10:52:42AM
LG05	18						3/10/99	10:49:06AM
LG05	19	x					3/10/99	11:25:02AM
LG06	1	x					3/8/99	10:02:18AM
LG06	2						3/8/99	10:13:34AM
LG06	3						3/8/99	10:19:05AM
LG06	4						3/8/99	10:20:28AM
LG06	5						3/8/99	10:23:55AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG06	6						3/8/99	10:25:53AM
LG06	7						3/8/99	10:28:42AM
LG06	8						3/8/99	10:32:36AM
LG06	9						3/8/99	10:34:56AM
LG06	10	x					3/8/99	10:37:13AM
LG06	11						3/8/99	09:47:23AM
LG06	12	x					3/8/99	09:25:44AM
LG06	13						3/8/99	09:24:39AM
LG06	14						3/8/99	09:32:08AM
LG06	15	x					3/8/99	09:37:38AM
LG06	16						3/8/99	09:36:12AM
LG06	17						3/8/99	09:00:17AM
LG06	18						3/8/99	09:06:06AM
LG06	19						3/8/99	09:12:29AM
LG06	20						3/8/99	09:14:36AM
LG06	21	x					3/8/99	09:16:23AM
LG06	22						3/8/99	09:21:49AM
LG06	23						3/8/99	09:08:12AM
LG06	24	x					3/8/99	09:41:39AM
LG06	25						3/8/99	09:49:50AM
LG06	26	x					3/8/99	09:54:18AM
LG06	27	x					3/8/99	11:00:11AM
LG06	28	x					3/8/99	10:55:13AM
LG06	29	x					3/8/99	10:50:57AM
LG06	30			x			3/8/99	10:42:33AM
LG08	1						3/4/99	10:25:09AM
LG08	2						3/4/99	10:16:34AM
LG08	3				x		3/4/99	10:09:20AM
LG08	4						3/4/99	09:22:34AM
LG08	5						3/4/99	09:19:31AM
LG08	6	x					3/4/99	09:07:43AM
LG08	7						3/4/99	09:14:18AM
LG08	8						3/4/99	08:59:50AM
LG08	9						3/4/99	08:56:08AM
LG08	10						3/4/99	08:51:34AM
LG08	11						3/4/99	08:47:02AM
LG08	12	x					3/4/99	08:40:14AM
LG08	13						3/4/99	08:35:03AM
LG08	14						3/4/99	08:30:14AM
LG08	15						3/4/99	08:19:37AM
LG08	16	x					3/4/99	08:23:37AM
LG08	17						3/4/99	08:14:45AM
LG08	18						3/4/99	08:10:27AM
LG08	19				x		3/4/99	08:05:45AM
LG08	20						3/4/99	08:02:36AM
LG08	21						3/4/99	07:59:03AM
LG08	22						3/4/99	07:54:17AM
LG08	23	x					3/4/99	07:48:35AM
LG08	24						3/4/99	07:43:46AM
LG08	25						3/4/99	07:39:21AM
LG08	26	x					3/4/99	07:30:41AM
LG09	1						3/11/99	08:18:21AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG09	2						3/11/99	08:22:03AM
LG09	3						3/11/99	08:27:42AM
LG09	4						3/11/99	08:25:55AM
LG09	5						3/11/99	08:30:22AM
LG09	6						3/11/99	08:15:30AM
LG09	7						3/11/99	08:10:53AM
LG09	8						3/11/99	08:08:03AM
LG09	9						3/11/99	07:59:27AM
LG09	10						3/11/99	07:51:12AM
LG09	11						3/11/99	07:50:00AM
LG09	12						3/11/99	07:48:31AM
LG09	13						3/11/99	07:44:50AM
LG09	14						3/11/99	07:40:51AM
LG09	15						3/11/99	07:37:38AM
LG09	16						3/11/99	07:42:18AM
LG09	17						3/11/99	07:53:56AM
LG09	18						3/11/99	08:51:48AM
LG09	19						3/11/99	08:42:47AM
LG09	20						3/11/99	08:47:14AM
LG09	21						3/11/99	08:41:16AM
LG09	22						3/11/99	08:39:30AM
LG09	23						3/11/99	08:34:42AM
LG09	24						3/11/99	08:12:19AM
LG09	25						3/11/99	08:04:37AM
LG09	26						3/11/99	07:55:38AM
LG14	1						3/10/99	01:12:42PM
LG14	2						3/10/99	01:01:12PM
LG14	3	x					3/10/99	12:47:19PM
LG14	4						3/10/99	11:06:06AM
LG14	5						3/10/99	11:08:13AM
LG14	6				x		3/10/99	11:12:30AM
LG14	7						3/10/99	11:19:09AM
LG14	8						3/10/99	11:20:49AM
LG14	9						3/10/99	11:27:52AM
LG14	10	x			x		3/10/99	11:30:08AM
LG14	11						3/10/99	11:35:52AM
LG14	12	x					3/10/99	12:13:06PM
LG14	13	x			x		3/10/99	12:21:00PM
LG14	14						3/10/99	12:53:55PM
LG14	15						3/10/99	12:55:56PM
LG14	16						3/10/99	01:03:35PM
LG14	17						3/10/99	01:07:17PM
LG14	18	x			x		3/10/99	12:00:26PM
LG14	19						3/10/99	12:09:17PM
LG14	20	x			x		3/10/99	12:26:20PM
LG14	21						3/10/99	12:40:32PM
LG14	22						3/10/99	12:57:00PM
LG14	23	x			x		3/10/99	12:31:38PM
LG14	24						3/10/99	11:40:45AM
LG14	25						3/10/99	11:22:01AM
LG14	26						3/10/99	01:08:44PM
LG15	1						3/9/99	08:29:51AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG15	2						3/9/99	08:38:02AM
LG15	3						3/9/99	08:43:29AM
MC02	1						3/12/99	07:38:49AM
MC02	2						3/12/99	07:45:57AM
MC02	3						3/12/99	08:02:56AM
MC02	4				x		3/12/99	08:05:50AM
MC02	5						3/12/99	08:12:25AM
MC02	6						3/12/99	08:15:59AM
MC02	7						3/12/99	08:18:50AM
MC02	8						3/12/99	08:20:34AM
MC02	9				x		3/12/99	08:37:12AM
MC02	10						3/12/99	08:32:38AM
MC02	11				x		3/12/99	08:24:36AM
MC02	12						3/12/99	08:52:01AM
MC02	13						3/12/99	08:54:53AM
MC02	14						3/12/99	08:59:41AM
MC02	15						3/12/99	09:39:39AM
MC02	16				x		3/12/99	09:22:17AM
MC02	17						3/12/99	09:25:59AM
MC02	18						3/12/99	09:38:00AM
MC02	19						3/12/99	09:08:44AM
MC02	20						3/12/99	08:56:44AM
MC02	21						3/12/99	08:46:30AM
MC02	22						3/12/99	08:44:58AM
MC02	23						3/12/99	08:21:57AM
MC02	24						3/12/99	07:58:05AM
MC02	25						3/12/99	08:01:20AM
MC02	26						3/12/99	07:48:37AM
MC02	27				x		3/12/99	07:53:56AM
MC02	28						3/12/99	08:14:03AM
MC02	29						3/12/99	08:17:08AM
MC02	30						3/12/99	08:41:32AM
MC02	31						3/12/99	08:23:40AM
MC02	32						3/12/99	08:30:56AM
MC02	33						3/12/99	09:04:01AM
MC02	34						3/12/99	09:06:26AM
MC02	35						3/12/99	09:11:48AM
MC02	36	x			x		3/12/99	09:17:10AM
MC02	37						3/12/99	09:35:31AM
MC02	38						3/12/99	09:37:01AM
MC02	39				x		3/12/99	09:33:14AM
MC03	1	x					3/11/99	12:10:51PM
MC03	2						3/11/99	12:08:58PM
MC03	3						3/11/99	12:19:05PM
MC03	4						3/11/99	12:21:42PM
MC03	5						3/11/99	12:05:42PM
MC03	6						3/11/99	11:47:49AM
MC03	7						3/11/99	11:36:59AM
MC03	8						3/11/99	11:52:43AM
MC03	9						3/11/99	11:56:56AM
MC03	10						3/11/99	12:00:27PM
MC03	11						3/11/99	12:28:32PM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC03	12						3/11/99	12:48:15PM
MC03	13	x					3/11/99	12:42:57PM
MC03	14	x					3/11/99	12:32:12PM
MC03	15						3/11/99	12:50:03PM
MC03	16						3/11/99	10:18:27AM
MC03	17						3/11/99	11:30:39AM
MC03	18	x					3/11/99	11:23:09AM
MC03	19						3/11/99	10:42:27AM
MC03	20				x		3/11/99	10:24:49AM
MC03	21						3/11/99	10:31:04AM
MC03	22						3/11/99	11:18:55AM
MC03	23						3/11/99	10:48:34AM
MC03	24						3/11/99	11:01:04AM
MC03	25						3/11/99	11:04:05AM
MC03	26						3/11/99	11:07:56AM
MC05	1						3/12/99	10:00:47AM
MC05	2						3/12/99	09:57:45AM
MC05	3						3/12/99	09:55:57AM
MC05	4						3/12/99	09:59:23AM
MC05	5						3/12/99	09:50:12AM
MC05	6						3/12/99	09:48:45AM
MC05	7						3/12/99	09:53:55AM
MC05	8						3/12/99	09:43:06AM
MC05	9						3/12/99	09:41:02AM
MC05	10						3/12/99	09:41:47AM
MC05	11						3/12/99	09:39:01AM
MC05	12						3/12/99	09:42:18AM
MC05	13						3/12/99	09:34:43AM
MC05	14						3/12/99	09:30:41AM
MC05	15	x					3/12/99	09:47:02AM
MC05	16	x					3/12/99	09:45:47AM
MC05	17						3/12/99	09:35:50AM
MC06	1						3/11/99	12:53:17PM
MC06	2						3/11/99	12:50:31PM
MC06	3						3/11/99	12:45:17PM
MC06	4						3/11/99	12:40:17PM
MC06	5						3/11/99	12:34:12PM
MC06	6						3/11/99	12:38:22PM
MC06	7						3/11/99	12:37:00PM
MC06	8						3/11/99	12:30:26PM
MC06	9						3/11/99	12:26:58PM
MC06	10	x					3/11/99	12:20:49PM
MC06	11						3/11/99	12:18:20PM
MC06	12						3/11/99	12:08:43PM
MC06	13						3/11/99	12:05:32PM
MC06	14						3/11/99	12:01:50PM
MC06	15						3/11/99	11:57:40AM
MC06	16						3/11/99	11:47:43AM
MC06	17						3/11/99	11:44:53AM
MC06	18						3/11/99	11:43:35AM
MC06	19						3/11/99	11:40:27AM
MC06	20						3/11/99	11:37:16AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC06	21						3/11/99	12:59:14PM
MC06	22						3/11/99	01:04:04PM
MC06	23						3/11/99	01:05:34PM
MC06	24						3/11/99	12:15:10PM
MC06	25						3/11/99	12:11:42PM
MC06	26	x					3/11/99	11:52:25AM
MC07	1						3/12/99	08:02:21AM
MC07	2						3/12/99	08:05:35AM
MC07	3						3/12/99	08:07:03AM
MC07	4						3/12/99	08:08:07AM
MC07	5						3/12/99	08:13:47AM
MC07	6						3/12/99	08:17:24AM
MC07	7						3/12/99	08:19:09AM
MC07	8						3/12/99	08:23:33AM
MC07	9						3/12/99	08:26:49AM
MC07	10						3/12/99	08:34:31AM
MC07	11						3/12/99	07:48:19AM
MC07	12						3/12/99	07:51:55AM
MC07	13						3/12/99	08:11:57AM
MC07	14						3/12/99	08:38:26AM
MC07	15						3/12/99	08:46:24AM
MC07	16						3/12/99	08:52:13AM
MC07	17						3/12/99	09:11:37AM
MC07	18						3/12/99	09:08:29AM
MC07	19						3/12/99	09:04:03AM
MC07	20						3/12/99	08:58:23AM
MC07	21						3/12/99	08:56:17AM
MC07	22						3/12/99	08:49:31AM
MC07	23						3/12/99	08:42:53AM
MC07	24						3/12/99	08:30:04AM
MC07	25						3/12/99	07:56:28AM
MC07	26						3/12/99	07:59:29AM
YL01	1	x					3/11/99	09:22:59AM
YL01	2						3/11/99	09:18:27AM
YL01	3						3/11/99	09:17:31AM
YL01	4						3/11/99	09:16:09AM
YL01	5				x		3/11/99	09:06:45AM
YL01	6						3/11/99	08:56:23AM
YL01	7						3/11/99	08:54:44AM
YL01	8						3/11/99	08:52:31AM
YL01	9						3/11/99	08:48:09AM
YL01	10						3/11/99	10:01:45AM
YL01	11						3/11/99	08:32:17AM
YL01	12				x		3/11/99	08:36:24AM
YL01	13						3/11/99	08:43:06AM
YL01	14						3/11/99	08:30:34AM
YL01	15						3/11/99	08:26:36AM
YL01	16	x					3/11/99	08:20:29AM
YL01	17						3/11/99	08:18:29AM
YL01	18						3/11/99	08:14:27AM
YL01	19	x					3/11/99	08:07:02AM
YL01	20						3/11/99	07:47:32AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #3

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
YL01	21				x		3/11/99	08:02:38AM
YL01	22						3/11/99	08:00:18AM
YL01	23	x					3/11/99	07:54:07AM
YL01	24						3/11/99	09:40:49AM
YL01	25						3/11/99	09:37:45AM
YL01	26						3/11/99	09:33:43AM
YL02	1						3/10/99	09:38:11AM
YL02	2						3/10/99	09:35:23AM
YL02	3						3/10/99	09:32:16AM
YL02	4						3/10/99	09:34:22AM
YL02	5						3/10/99	09:31:19AM
YL02	6						3/10/99	09:24:10AM
YL02	7						3/10/99	09:22:31AM
YL02	8						3/10/99	09:21:29AM
YL02	9						3/10/99	09:20:01AM
YL02	10						3/10/99	09:05:50AM
YL02	11						3/10/99	09:07:02AM
YL02	12						3/10/99	09:04:44AM
YL02	13						3/10/99	09:03:46AM
YL02	14						3/10/99	08:56:46AM
YL02	15						3/10/99	08:59:39AM
YL02	16						3/10/99	09:00:59AM
YL02	17						3/10/99	09:12:50AM
YL02	18						3/10/99	09:11:22AM
YL02	19						3/10/99	09:14:18AM
YL02	20						3/10/99	09:16:11AM
YL02	21						3/10/99	09:26:28AM
YL02	22						3/10/99	09:27:57AM
YL02	23						3/10/99	09:44:05AM
YL02	24						3/10/99	09:48:03AM
YL02	25						3/10/99	09:57:34AM
YL02	26						3/10/99	10:00:40AM
YL02	27						3/10/99	10:03:01AM
YL02	28						3/10/99	10:07:53AM
YL02	29						3/10/99	10:10:29AM
YL02	30						3/10/99	10:15:22AM
YL02	31						3/10/99	10:17:27AM

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR02	1						3/22/99	01:27:24P
BR02	2						3/22/99	01:22:51P
BR02	3						3/22/99	01:20:17P
BR02	4						3/22/99	12:23:20P
BR02	5						3/22/99	12:21:28P
BR02	6						3/22/99	12:04:11P
BR02	7						3/22/99	11:28:34A
BR02	8						3/22/99	12:32:40P
BR02	9						3/22/99	11:47:28A
BR02	10						3/22/99	11:54:30A
BR02	11						3/22/99	11:58:57A
BR02	12						3/22/99	11:58:48A
BR02	13						3/22/99	11:42:41A
BR02	14						3/22/99	11:15:13A
BR02	15						3/22/99	11:20:22A
BR02	16						3/22/99	01:17:05P
BR02	17						3/22/99	01:35:56P
BR02	18						3/22/99	01:39:14P
BR02	19						3/22/99	11:37:47A
BR02	20						3/22/99	11:34:35A
BR02	21						3/22/99	12:17:49P
BR02	22						3/22/99	01:07:05P
BR02	23						3/22/99	01:03:14P
BR02	24						3/22/99	01:10:46P
BR03A	1						3/23/99	08:53:29A
BR03A	2						3/23/99	08:57:42A
BR03A	3						3/23/99	09:48:05A
BR03A	4						3/23/99	09:43:29A
BR03A	5						3/23/99	09:39:08A
BR03A	6						3/23/99	09:03:13A
BR03A	7						3/23/99	09:08:25A
BR03A	8						3/23/99	09:10:41A
BR03A	9						3/23/99	09:13:12A
BR03A	10						3/23/99	09:15:33A
BR03A	11						3/23/99	09:19:17A
BR03A	12						3/23/99	09:33:45A
BR03A	13						3/23/99	09:29:39A
BR03A	14						3/23/99	09:24:25A
BR03A	15						3/22/99	01:54:57P
BR03A	16						3/22/99	01:51:18P
BR03A	17						3/22/99	02:00:01P
BR03A	18						3/22/99	02:02:35P
BR03A	19						3/22/99	02:07:01P
BR03A	20						3/22/99	02:10:39P
BR03A	21						3/23/99	08:50:32A
BR03A	22						3/23/99	08:33:42A
BR03A	23						3/23/99	08:40:00A
BR03A	24						3/23/99	08:43:54A
BR03A	25						3/22/99	02:14:52P
BR03A	26						3/23/99	08:47:58A
BR03B	1						3/22/99	08:57:13A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR03B	2						3/22/99	08:51:52A
BR03B	3						3/22/99	08:49:42A
BR03B	4						3/22/99	08:46:44A
BR03B	5						3/22/99	08:50:50A
BR03B	6						3/22/99	08:53:04A
BR03B	7						3/22/99	08:59:11A
BR03B	8						3/22/99	09:03:32A
BR03B	9						3/22/99	09:10:24A
BR03B	10						3/22/99	09:12:28A
BR03B	11						3/22/99	09:14:30A
BR03B	12						3/22/99	09:21:30A
BR03B	13						3/22/99	09:17:50A
BR03B	14						3/22/99	09:24:05A
BR03B	15						3/22/99	09:26:02A
BR03B	16						3/22/99	09:27:44A
BR03B	17						3/22/99	09:29:32A
BR03B	18						3/22/99	09:32:26A
BR03B	19						3/22/99	10:12:14A
BR03B	20						3/22/99	10:08:01A
BR03B	21						3/22/99	09:58:44A
BR03B	22						3/22/99	09:56:02A
BR03B	23						3/22/99	09:57:15A
BR03B	24						3/22/99	09:54:14A
BR03B	25						3/22/99	09:52:06A
BR03B	26						3/22/99	09:44:19A
BR05	1						3/22/99	09:56:11A
BR05	2						3/22/99	10:05:56A
BR05	3						3/22/99	10:18:35A
BR05	4						3/22/99	10:22:17A
BR05	5						3/22/99	09:48:37A
BR05	6						3/22/99	09:52:25A
BR05	7						3/22/99	09:45:36A
BR05	8						3/22/99	09:41:22A
BR05	9						3/22/99	09:35:43A
BR05	10						3/22/99	10:10:17A
BR05	11						3/22/99	10:55:37A
BR05	12						3/22/99	10:51:52A
BR05	13						3/22/99	10:48:45A
BR05	14						3/22/99	10:42:25A
BR05	15						3/22/99	10:13:05A
BR05	16						3/22/99	09:31:53A
BR05	17						3/22/99	09:21:53A
BR05	18						3/22/99	09:11:08A
BR05	19						3/22/99	09:03:26A
BR05	20						3/22/99	08:56:53A
BR05	21						3/22/99	10:29:08A
BR05	22						3/22/99	10:35:41A
BR06	1						3/22/99	11:34:55A
BR06	2						3/22/99	11:13:55A
BR06	3						3/22/99	11:08:20A
BR06	4						3/22/99	11:05:49A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR06	5						3/22/99	11:01:30A
BR06	6						3/22/99	10:59:33A
BR06	7						3/22/99	10:54:47A
BR06	8						3/22/99	10:48:48A
BR06	9						3/22/99	10:43:28A
BR06	10						3/22/99	10:41:32A
BR06	11						3/22/99	10:39:25A
BR06	12						3/22/99	10:34:17A
BR06	13						3/22/99	11:20:50A
BR06	14						3/22/99	11:44:28A
BR06	15						3/22/99	12:27:31P
BR06	16						3/22/99	12:35:47P
BR06	17						3/22/99	12:31:44P
BR06	18						3/22/99	12:30:41P
BR06	19						3/22/99	12:24:49P
BR06	20						3/22/99	12:23:42P
BR06	21						3/22/99	11:57:43A
BR06	22						3/22/99	11:54:36A
BR06	23						3/22/99	11:52:37A
BR06	24						3/22/99	11:26:08A
BR06	25						3/22/99	11:38:35A
BR06	26						3/22/99	11:32:49A
BR10	1						3/23/99	09:15:47A
BR10	2						3/23/99	09:08:18A
BR10	3						3/23/99	09:03:00A
BR10	4						3/23/99	08:59:05A
BR10	5						3/23/99	09:12:01A
BR10	6						3/23/99	09:13:32A
BR10	7						3/23/99	09:09:22A
BR10	8						3/23/99	09:10:20A
BR10	9						3/23/99	08:29:22A
BR10	10						3/23/99	08:32:37A
BR10	11						3/23/99	08:34:52A
BR10	12						3/23/99	08:46:47A
BR10	13						3/23/99	08:47:34A
BR10	14						3/23/99	08:49:40A
BR10	15						3/23/99	08:44:57A
BR10	16						3/23/99	08:39:27A
BR10	17						3/23/99	08:37:11A
BR10	18						3/23/99	08:52:43A
BR10	19						3/23/99	08:56:34A
BR10	20						3/23/99	08:57:29A
BR10	21						3/23/99	09:18:08A
BR10	22						3/23/99	09:20:07A
BR12	1						3/22/99	10:26:09A
BR12	2						3/22/99	10:30:23A
BR12	3						3/22/99	10:42:12A
BR12	4						3/22/99	10:39:32A
BR12	5						3/22/99	10:40:02A
BR12	6						3/22/99	10:53:26A
BR12	7						3/22/99	10:55:42A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR12	8						3/22/99	11:00:31A
BR12	9						3/22/99	10:59:20A
BR12	10						3/22/99	11:03:56A
BR12	11						3/22/99	11:02:42A
BR12	12						3/22/99	11:10:24A
BR12	13						3/22/99	11:59:11A
BR12	14						3/22/99	12:01:14P
BR12	15						3/22/99	12:01:54P
BR12	16						3/22/99	10:35:46A
BR12	17						3/22/99	10:33:13A
BR12	18						3/22/99	10:45:40A
BR12	19						3/22/99	11:17:14A
BR12	20						3/22/99	11:20:02A
BR12	21						3/22/99	11:21:28A
BR12	22						3/22/99	11:22:23A
BR12	23						3/22/99	11:25:02A
BR12	24						3/22/99	11:32:35A
BR12	25						3/22/99	11:36:39A
BR12	26						3/22/99	11:45:31A
BR12	27						3/22/99	11:49:14A
FC02	1						3/23/99	01:03:16P
FC02	2						3/23/99	01:06:16P
FC02	3						3/23/99	01:08:55P
FC02	4						3/23/99	12:58:25P
FC02	5						3/23/99	01:22:48P
FC02	6						3/23/99	01:16:02P
FC02	7						3/23/99	01:19:08P
FC02	8						3/23/99	01:26:29P
FC02	9						3/23/99	01:38:54P
FC02	10						3/23/99	02:01:40P
FC02	11						3/23/99	01:41:43P
FC02	12						3/23/99	01:44:21P
FC02	13						3/24/99	07:42:19A
FC02	14						3/24/99	07:39:35A
FC02	15						3/24/99	07:36:17A
FC02	16						3/23/99	02:15:24P
FC02	17						3/24/99	08:09:16A
FC02	18						3/24/99	08:04:06A
FC02	19						3/24/99	08:00:42A
FC02	20						3/24/99	07:54:29A
FC02	21						3/24/99	07:57:27A
FC02	22						3/24/99	07:47:33A
FC02	23						3/23/99	01:31:43P
FC02	24						3/23/99	01:51:23P
FC02	25						3/23/99	01:35:50P
FC02	26						3/23/99	01:47:31P
FC03	1						3/23/99	10:27:08A
FC03	2						3/23/99	10:34:02A
FC03	3						3/23/99	10:40:30A
FC03	4						3/23/99	10:37:25A
FC03	5						3/23/99	11:00:55A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC03	6						3/23/99	11:36:08A
FC03	7						3/23/99	11:39:42A
FC03	8						3/23/99	11:42:42A
FC03	9						3/23/99	11:47:07A
FC03	10						3/23/99	11:49:56A
FC03	11						3/23/99	12:01:19P
FC03	12						3/23/99	11:54:19A
FC03	13						3/23/99	11:26:26A
FC03	14						3/23/99	11:21:38A
FC03	15						3/23/99	11:16:09A
FC03	16						3/23/99	11:11:27A
FC03	17						3/23/99	11:05:55A
FC03	18						3/23/99	11:58:19A
FC03	19						3/23/99	10:12:44A
FC03	20						3/23/99	10:20:22A
FC03	21						3/23/99	10:30:41A
FC03	22						3/23/99	10:47:56A
FC03	23						3/23/99	10:53:01A
FC03	24						3/23/99	10:56:14A
FC05	1						3/24/99	09:08:20A
FC05	2						3/24/99	09:05:25A
FC05	3						3/24/99	09:01:22A
FC05	4						3/24/99	08:59:14A
FC05	5						3/24/99	08:55:50A
FC05	6						3/24/99	08:50:28A
FC05	7						3/24/99	08:41:26A
FC05	8						3/24/99	08:39:12A
FC05	9						3/24/99	08:35:09A
FC05	10						3/24/99	08:29:22A
FC05	11						3/24/99	08:22:09A
FC05	12						3/24/99	08:44:28A
FC08	1						3/25/99	08:46:19A
FC08	2						3/25/99	09:36:58A
FC08	3						3/25/99	09:39:30A
FC08	4						3/25/99	09:41:26A
FC08	5						3/25/99	09:44:06A
FC08	6						3/25/99	09:46:36A
FC08	7						3/25/99	09:49:32A
FC08	8						3/25/99	09:51:42A
FC08	9						3/25/99	09:56:16A
FC08	10						3/25/99	10:01:39A
FC08	11						3/25/99	08:30:05A
FC08	12						3/25/99	09:59:21A
FC08	13						3/25/99	09:15:39A
FC08	14						3/25/99	09:23:19A
FC08	15						3/25/99	09:08:56A
FC08	16						3/25/99	09:01:01A
FC08	17						3/25/99	08:57:49A
FC08	18						3/25/99	09:31:47A
FC08	19						3/25/99	09:34:17A
FC08	20						3/25/99	09:29:10A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC10	1						3/24/99	09:48:52A
FC10	2						3/24/99	09:45:51A
FC10	3						3/24/99	10:07:40A
FC10	4						3/24/99	10:04:26A
FC10	5						3/24/99	10:14:17A
FC10	6						3/24/99	10:17:34A
FC10	7						3/24/99	10:11:04A
FC10	8						3/24/99	10:31:15A
FC10	9						3/24/99	10:42:05A
FC10	10						3/24/99	10:49:09A
FC10	11						3/24/99	10:52:57A
FC10	12						3/24/99	10:57:05A
FC10	13						3/24/99	10:59:44A
FC10	14						3/24/99	11:07:07A
FC10	15						3/24/99	11:09:56A
FC10	16						3/24/99	11:04:11A
FC10	17						3/24/99	11:38:28A
FC10	18						3/24/99	11:43:43A
FC10	19						3/24/99	11:40:57A
FC10	20						3/24/99	11:28:10A
FC10	21						3/24/99	11:16:44A
FC10	22						3/24/99	11:19:43A
FC10	23						3/24/99	11:50:58A
FC10	24						3/24/99	09:23:10A
FC10	25						3/24/99	09:54:20A
FC10	26						3/24/99	11:33:21A
FC10	27						3/24/99	11:24:35A
FC10	28						3/24/99	11:22:02A
FC10	29						3/24/99	11:13:24A
FC10	30						3/24/99	11:01:57A
FC10	31						3/24/99	10:20:32A
FC10	32						3/24/99	09:36:01A
FC10	33						3/24/99	09:33:38A
FC10	34						3/24/99	09:29:53A
LG01	1						3/22/99	01:15:53P
LG01	2						3/22/99	01:17:21P
LG01	3						3/22/99	01:18:29P
LG01	4						3/22/99	01:19:45P
LG01	5						3/22/99	01:21:15P
LG01	6						3/22/99	01:22:41P
LG01	7						3/22/99	01:26:07P
LG01	8						3/22/99	12:55:22P
LG01	9						3/22/99	12:57:25P
LG01	10						3/22/99	12:58:44P
LG01	11						3/22/99	12:51:40P
LG01	12						3/22/99	01:14:31P
LG01	13						3/22/99	01:13:27P
LG01	14						3/22/99	01:11:59P
LG01	15						3/22/99	01:04:33P
LG01	16						3/22/99	01:06:18P
LG01	17						3/22/99	01:07:26P

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG01	18						3/22/99	01:09:12P
LG01	19						3/22/99	01:52:54P
LG01	20						3/22/99	01:55:46P
LG01	21						3/22/99	01:56:46P
LG01	22						3/22/99	02:02:15P
LG01	23						3/22/99	01:37:26P
LG01	24						3/22/99	01:44:35P
LG01	25						3/22/99	01:47:31P
LG01	26						3/22/99	02:04:21P
LG02	1						3/23/99	09:25:09A
LG02	2						3/23/99	09:13:52A
LG02	3						3/23/99	09:07:53A
LG02	4						3/23/99	09:12:02A
LG02	5						3/23/99	09:10:06A
LG02	6						3/23/99	09:05:14A
LG02	7						3/23/99	08:51:14A
LG02	8						3/23/99	08:47:43A
LG02	9						3/23/99	08:43:36A
LG02	10						3/23/99	08:45:17A
LG02	11						3/23/99	08:41:07A
LG02	12						3/23/99	08:38:42A
LG02	13						3/23/99	08:36:14A
LG02	14						3/23/99	08:31:47A
LG02	15						3/23/99	08:30:12A
LG02	16						3/23/99	08:26:25A
LG02	17						3/23/99	09:48:50A
LG02	18						3/23/99	09:47:48A
LG02	19						3/23/99	09:42:00A
LG02	20						3/23/99	09:43:29A
LG02	21						3/23/99	09:45:43A
LG02	22						3/23/99	09:39:46A
LG02	23						3/23/99	09:29:42A
LG02	24						3/23/99	09:31:12A
LG02	25						3/23/99	09:32:54A
LG02	26						3/23/99	09:35:13A
LG02	27						3/23/99	09:01:00A
LG02	28						3/23/99	08:59:39A
LG02	29	x					3/23/99	08:58:26A
LG02	30						3/23/99	08:57:07A
LG02	31						3/23/99	08:55:09A
LG03	1						3/24/99	08:40:12A
LG03	2						3/24/99	08:41:12A
LG03	7						3/24/99	08:34:05A
LG03	9						3/24/99	08:35:31A
LG03	10						3/24/99	08:32:58A
LG03	12						3/24/99	08:36:28A
LG03	13						3/24/99	08:31:39A
LG03	14						3/24/99	08:30:18A
LG03	15						3/24/99	08:28:48A
LG03	16						3/24/99	08:27:40A
LG03	17						3/24/99	08:25:56A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG03	18						3/24/99	08:21:28A
LG03	19						3/24/99	08:37:53A
LG03	20						3/24/99	11:11:52A
LG03	21						3/24/99	08:48:36A
LG03	22						3/24/99	08:49:24A
LG03	23						3/24/99	08:42:53A
LG03	24						3/24/99	08:43:43A
LG03	25						3/24/99	08:45:12A
LG03	26						3/24/99	08:46:31A
LG04	1						3/23/99	11:21:11A
LG04	2						3/23/99	11:24:47A
LG04	3						3/23/99	11:26:00A
LG04	4						3/23/99	11:27:18A
LG04	5						3/23/99	11:31:58A
LG04	6						3/23/99	11:30:52A
LG04	7						3/23/99	11:29:33A
LG04	8						3/23/99	11:28:39A
LG04	9						3/23/99	10:55:58A
LG04	10						3/23/99	10:57:02A
LG04	11						3/23/99	11:06:08A
LG04	12						3/23/99	11:04:19A
LG04	13						3/23/99	11:02:41A
LG04	14						3/23/99	11:01:41A
LG04	15						3/23/99	10:59:54A
LG04	16						3/23/99	11:09:07A
LG04	17						3/23/99	10:52:55A
LG04	18						3/23/99	10:50:36A
LG04	19						3/23/99	10:47:30A
LG04	20						3/23/99	10:41:51A
LG04	21						3/23/99	10:58:05A
LG04	22						3/23/99	11:13:42A
LG04	23						3/23/99	11:07:13A
LG04	24						3/23/99	11:07:57A
LG04	25						3/23/99	11:17:41A
LG04	26						3/23/99	11:18:41A
LG05	1						3/23/99	09:52:06A
LG05	2						3/23/99	09:50:10A
LG05	3						3/23/99	09:53:16A
LG05	4						3/23/99	09:55:27A
LG05	5						3/23/99	09:54:16A
LG05	6						3/23/99	09:56:49A
LG05	7						3/23/99	09:59:17A
LG05	8						3/23/99	09:58:07A
LG05	9						3/23/99	10:01:04A
LG05	10						3/23/99	10:02:32A
LG05	11						3/23/99	10:05:21A
LG05	12						3/23/99	10:26:33A
LG05	13						3/23/99	10:19:49A
LG05	14						3/23/99	10:17:05A
LG05	15						3/23/99	10:08:42A
LG05	16						3/23/99	10:24:53A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG05	17						3/23/99	10:03:56A
LG05	18						3/23/99	10:06:41A
LG05	19						3/23/99	09:39:16A
LG06	1						3/22/99	01:34:39P
LG06	2						3/22/99	01:39:44P
LG06	3						3/22/99	01:41:26P
LG06	4						3/22/99	01:42:40P
LG06	5						3/22/99	01:44:00P
LG06	6						3/22/99	01:46:10P
LG06	7						3/22/99	01:47:53P
LG06	8						3/22/99	01:50:17P
LG06	9						3/22/99	01:52:19P
LG06	10						3/22/99	01:55:27P
LG06	11						3/22/99	01:27:29P
LG06	12						3/22/99	01:15:39P
LG06	13						3/22/99	01:13:57P
LG06	14						3/22/99	01:17:32P
LG06	15						3/22/99	01:24:10P
LG06	16						3/22/99	01:22:27P
LG06	17						3/22/99	12:56:20P
LG06	18						3/22/99	01:03:33P
LG06	19						3/22/99	01:07:11P
LG06	20						3/22/99	01:08:25P
LG06	21						3/22/99	01:10:16P
LG06	22						3/22/99	01:11:36P
LG06	23						3/22/99	01:05:47P
LG06	24						3/22/99	01:25:21P
LG06	25						3/22/99	01:29:40P
LG06	26						3/22/99	01:31:18P
LG06	27						3/23/99	02:10:26P
LG06	28						3/23/99	02:06:27P
LG06	29						3/23/99	02:05:16P
LG06	30						3/23/99	01:56:57P
LG08	1						3/22/99	09:55:25A
LG08	2						3/22/99	09:50:56A
LG08	3						3/22/99	09:46:16A
LG08	4						3/22/99	09:42:16A
LG08	5						3/22/99	09:39:11A
LG08	6						3/22/99	09:32:44A
LG08	7						3/22/99	09:37:44A
LG08	8						3/22/99	09:25:13A
LG08	9						3/22/99	09:23:33A
LG08	10						3/22/99	09:21:24A
LG08	11						3/22/99	09:19:28A
LG08	12						3/22/99	09:15:00A
LG08	13						3/22/99	09:12:48A
LG08	14						3/22/99	09:09:59A
LG08	15						3/22/99	09:03:09A
LG08	16						3/22/99	09:04:59A
LG08	17						3/22/99	09:01:18A
LG08	18						3/22/99	08:55:13A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG08	19						3/22/99	08:53:04A
LG08	20						3/22/99	08:51:47A
LG08	21						3/22/99	08:50:13A
LG08	22						3/22/99	08:47:17A
LG08	23						3/22/99	08:43:32A
LG08	24						3/22/99	08:41:41A
LG08	25						3/22/99	08:38:49A
LG08	26						3/22/99	08:35:37A
LG09	1						3/24/99	07:55:40A
LG09	2						3/24/99	07:57:03A
LG09	3						3/24/99	07:59:35A
LG09	4						3/24/99	07:58:09A
LG09	5						3/24/99	08:00:41A
LG09	6						3/24/99	07:53:49A
LG09	7						3/24/99	07:50:45A
LG09	8						3/24/99	07:49:44A
LG09	9						3/24/99	07:46:39A
LG09	10						3/24/99	07:42:13A
LG09	11						3/24/99	07:41:18A
LG09	12						3/24/99	07:40:08A
LG09	13						3/24/99	07:37:49A
LG09	14						3/24/99	07:34:14A
LG09	15						3/24/99	07:31:10A
LG09	16						3/24/99	07:35:43A
LG09	17						3/24/99	07:43:47A
LG09	18						3/24/99	08:10:48A
LG09	19						3/24/99	08:06:26A
LG09	20						3/24/99	08:07:39A
LG09	21						3/24/99	08:05:14A
LG09	22						3/24/99	08:04:08A
LG09	23						3/24/99	08:02:50A
LG09	24						3/24/99	07:51:59A
LG09	25						3/24/99	07:48:10A
LG09	26						3/24/99	07:44:56A
LG14	1						3/25/99	10:55:36A
LG14	2						3/25/99	10:41:56A
LG14	3						3/25/99	10:35:48A
LG14	4						3/25/99	10:06:15A
LG14	5						3/25/99	10:07:49A
LG14	6						3/25/99	10:08:59A
LG14	7						3/25/99	10:09:46A
LG14	8						3/25/99	10:10:44A
LG14	9						3/25/99	10:13:22A
LG14	10						3/25/99	10:14:51A
LG14	11						3/25/99	10:15:22A
LG14	12						3/25/99	10:24:34A
LG14	13						3/25/99	10:25:44A
LG14	14						3/25/99	10:38:09A
LG14	15						3/25/99	10:39:40A
LG14	16						3/25/99	10:45:41A
LG14	17						3/25/99	10:54:22A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG14	18						3/25/99	10:22:37A
LG14	19						3/25/99	10:23:29A
LG14	20						3/25/99	10:27:41A
LG14	21						3/25/99	10:30:20A
LG14	22						3/25/99	10:40:50A
LG14	23						3/25/99	10:28:25A
LG14	24						3/25/99	10:21:10A
LG14	25						3/25/99	10:11:52A
LG14	26						3/25/99	10:52:29A
LG15	1						3/23/99	10:00:13A
LG15	2						3/23/99	10:06:19A
LG15	3						3/23/99	10:04:10A
MC02	1						3/25/99	10:09:38A
MC02	2						3/25/99	10:13:25A
MC02	3						3/25/99	10:26:22A
MC02	4						3/25/99	10:28:53A
MC02	5						3/25/99	10:32:13A
MC02	6						3/25/99	10:38:32A
MC02	7						3/25/99	10:44:12A
MC02	8						3/25/99	10:46:43A
MC02	9						3/25/99	11:08:05A
MC02	10						3/25/99	11:02:03A
MC02	11						3/25/99	10:55:08A
MC02	12						3/25/99	11:24:41A
MC02	13						3/25/99	11:30:09A
MC02	14						3/25/99	11:36:33A
MC02	15						3/25/99	12:21:38P
MC02	16						3/25/99	12:00:24P
MC02	17						3/25/99	12:05:39P
MC02	18						3/25/99	12:17:49P
MC02	19						3/25/99	11:46:13A
MC02	20						3/25/99	11:33:13A
MC02	21						3/25/99	11:18:31A
MC02	22						3/25/99	11:13:55A
MC02	23						3/25/99	10:49:16A
MC02	24						3/25/99	10:21:30A
MC02	25						3/25/99	10:24:03A
MC02	26						3/25/99	10:16:52A
MC02	27						3/25/99	10:19:10A
MC02	28						3/25/99	10:36:02A
MC02	29						3/25/99	10:41:02A
MC02	30						3/25/99	11:10:45A
MC02	31						3/25/99	10:52:39A
MC02	32						3/25/99	10:58:15A
MC02	33						3/25/99	11:39:22A
MC02	34						3/25/99	11:42:36A
MC02	35						3/25/99	11:53:37A
MC02	36						3/25/99	11:57:27A
MC02	37						3/25/99	12:11:47P
MC02	38						3/25/99	12:15:05P
MC02	39						3/25/99	12:03:04P

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC03	1						3/25/99	09:19:59A
MC03	2						3/26/99	04:01:10P
MC03	3						3/25/99	09:18:33A
MC03	4						3/25/99	09:17:08A
MC03	5						3/25/99	09:15:58A
MC03	6						3/25/99	09:10:12A
MC03	7						3/25/99	09:08:57A
MC03	8						3/25/99	09:11:20A
MC03	9						3/25/99	09:12:22A
MC03	10						3/25/99	09:13:45A
MC03	11						3/25/99	09:22:02A
MC03	12						3/25/99	09:24:44A
MC03	13						3/25/99	09:23:54A
MC03	14						3/25/99	09:22:52A
MC03	15						3/25/99	09:25:58A
MC03	16						3/25/99	09:07:29A
MC03	17						3/25/99	08:59:05A
MC03	18						3/25/99	08:53:54A
MC03	19						3/25/99	08:52:41A
MC03	20						3/25/99	08:51:36A
MC03	21						3/25/99	08:50:21A
MC03	22						3/25/99	08:49:15A
MC03	23						3/25/99	08:48:17A
MC03	24						3/25/99	08:35:50A
MC03	25						3/25/99	08:39:25A
MC03	26						3/25/99	08:42:39A
MC05	1						3/26/99	03:50:19P
MC05	2						3/26/99	03:44:35P
MC05	3						3/26/99	03:41:51P
MC05	4						3/26/99	03:46:58P
MC05	5						3/26/99	10:15:10A
MC05	6						3/26/99	10:08:07A
MC05	7						3/26/99	03:36:36P
MC05	8						3/26/99	09:43:23A
MC05	9						3/26/99	09:33:55A
MC05	10						3/26/99	09:38:01A
MC05	11						3/26/99	09:30:26A
MC05	12						3/26/99	09:40:38A
MC05	13						3/26/99	09:22:20A
MC05	14						3/26/99	09:14:46A
MC05	15						3/26/99	10:00:09A
MC05	16						3/26/99	09:55:15A
MC05	17						3/26/99	09:25:54A
MC06	1						3/25/99	09:52:22A
MC06	2						3/25/99	09:50:40A
MC06	3						3/25/99	09:44:47A
MC06	4						3/25/99	09:26:42A
MC06	5						3/25/99	09:18:09A
MC06	6						3/25/99	09:25:23A
MC06	7						3/25/99	09:24:13A
MC06	8						3/25/99	09:11:38A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC06	9						3/25/99	09:08:29A
MC06	10						3/25/99	09:04:50A
MC06	11						3/25/99	09:03:13A
MC06	12						3/25/99	08:57:54A
MC06	13						3/25/99	08:52:53A
MC06	14						3/25/99	08:51:28A
MC06	15						3/25/99	08:50:30A
MC06	16						3/25/99	08:44:43A
MC06	17						3/25/99	08:42:54A
MC06	18						3/25/99	08:41:53A
MC06	19						3/25/99	08:40:00A
MC06	20						3/25/99	08:38:48A
MC06	21						3/25/99	09:38:36A
MC06	22						3/25/99	09:33:04A
MC06	23						3/25/99	09:35:39A
MC06	24						3/25/99	09:01:04A
MC06	25						3/25/99	08:59:26A
MC06	26						3/25/99	08:46:34A
MC07	1						3/25/99	11:04:18A
MC07	2						3/25/99	11:02:13A
MC07	3						3/25/99	10:56:30A
MC07	4						3/25/99	10:55:32A
MC07	5						3/25/99	10:48:41A
MC07	6						3/25/99	10:47:39A
MC07	7						3/25/99	10:46:14A
MC07	8						3/25/99	10:45:12A
MC07	9						3/25/99	10:43:18A
MC07	10						3/25/99	10:29:56A
MC07	11						3/25/99	11:13:25A
MC07	12						3/25/99	11:11:23A
MC07	13						3/25/99	10:53:16A
MC07	14						3/25/99	10:23:53A
MC07	15						3/25/99	10:20:41A
MC07	16						3/25/99	10:16:29A
MC07	17						3/25/99	09:55:09A
MC07	18						3/25/99	10:03:27A
MC07	19						3/25/99	10:05:23A
MC07	20						3/25/99	10:11:45A
MC07	21						3/25/99	10:13:46A
MC07	22						3/25/99	10:18:25A
MC07	23						3/25/99	10:22:21A
MC07	24						3/25/99	10:40:39A
MC07	25						3/25/99	11:10:01A
MC07	26						3/25/99	11:08:09A
YL01	1						3/24/99	08:15:11A
YL01	2						3/24/99	08:14:26A
YL01	3						3/24/99	08:13:54A
YL01	4						3/24/99	08:12:51A
YL01	5						3/24/99	08:04:54A
YL01	6						3/24/99	08:03:02A
YL01	7						3/24/99	08:02:23A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #4

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
YL01	8						3/24/99	08:01:50A
YL01	9						3/24/99	08:01:01A
YL01	10						3/24/99	08:20:22A
YL01	11						3/24/99	07:52:26A
YL01	12						3/24/99	07:53:12A
YL01	13						3/24/99	07:58:15A
YL01	14						3/24/99	07:51:35A
YL01	15						3/24/99	07:50:05A
YL01	16						3/24/99	07:48:18A
YL01	17						3/24/99	07:47:27A
YL01	18						3/24/99	07:46:49A
YL01	19						3/24/99	07:46:00A
YL01	20						3/24/99	07:37:46A
YL01	21						3/24/99	07:44:53A
YL01	22						3/24/99	07:42:47A
YL01	23						3/24/99	07:41:37A
YL01	24						3/24/99	08:26:38A
YL01	25						3/24/99	08:25:28A
YL01	26						3/24/99	08:24:39A
YL02	1						3/23/99	11:25:14A
YL02	2						3/23/99	11:19:17A
YL02	3						3/23/99	11:20:05A
YL02	4						3/23/99	11:20:40A
YL02	5						3/23/99	11:22:06A
YL02	6						3/23/99	11:11:47A
YL02	7						3/23/99	11:09:55A
YL02	8						3/23/99	11:08:49A
YL02	9						3/23/99	11:07:59A
YL02	10						3/23/99	10:54:21A
YL02	11						3/23/99	10:56:40A
YL02	12						3/23/99	10:53:37A
YL02	13						3/23/99	10:52:51A
YL02	14						3/23/99	10:46:06A
YL02	15						3/23/99	10:48:44A
YL02	16						3/23/99	10:50:09A
YL02	17						3/23/99	10:58:23A
YL02	18						3/23/99	10:57:36A
YL02	19						3/23/99	11:00:22A
YL02	20						3/23/99	11:04:53A
YL02	21						3/23/99	11:13:33A
YL02	22						3/23/99	11:15:49A
YL02	23						3/23/99	11:52:45A
YL02	24						3/23/99	11:55:03A
YL02	25						3/23/99	12:00:46P
YL02	26						3/23/99	12:03:48P
YL02	27						3/23/99	12:05:44P
YL02	28						3/23/99	12:09:35P
YL02	29						3/23/99	12:12:46P
YL02	30						3/23/99	12:11:55P
YL02	31						3/23/99	12:14:24P

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR02	1						3/22/99	01:27:24P
BR02	2						3/22/99	01:22:51P
BR02	3						3/22/99	01:20:17P
BR02	4						3/22/99	12:23:20P
BR02	5						3/22/99	12:21:28P
BR02	6						3/22/99	12:04:11P
BR02	7						3/22/99	11:28:34A
BR02	8						3/22/99	12:32:40P
BR02	9						3/22/99	11:47:26A
BR02	10						3/22/99	11:54:30A
BR02	11						3/22/99	11:56:57A
BR02	12						3/22/99	11:58:48A
BR02	13						3/22/99	11:42:41A
BR02	14						3/22/99	11:15:13A
BR02	15						3/22/99	11:20:22A
BR02	16						3/22/99	01:17:05P
BR02	17						3/22/99	01:35:56P
BR02	18						3/22/99	01:39:14P
BR02	19						3/22/99	11:37:47A
BR02	20						3/22/99	11:34:35A
BR02	21						3/22/99	12:17:49P
BR02	22						3/22/99	01:07:05P
BR02	23						3/22/99	01:03:14P
BR02	24						3/22/99	01:10:48P
BR03A	1						3/23/99	08:53:29A
BR03A	2						3/23/99	08:57:42A
BR03A	3						3/23/99	09:48:05A
BR03A	4						3/23/99	09:43:29A
BR03A	5						3/23/99	09:39:08A
BR03A	6						3/23/99	09:03:13A
BR03A	7						3/23/99	09:08:25A
BR03A	8						3/23/99	09:10:41A
BR03A	9						3/23/99	09:13:12A
BR03A	10						3/23/99	09:15:33A
BR03A	11						3/23/99	09:19:17A
BR03A	12						3/23/99	09:33:45A
BR03A	13						3/23/99	09:29:39A
BR03A	14						3/23/99	09:24:25A
BR03A	15						3/22/99	01:54:57P
BR03A	16						3/22/99	01:51:18P
BR03A	17						3/22/99	02:00:01P
BR03A	18						3/22/99	02:02:35P
BR03A	19						3/22/99	02:07:01P
BR03A	20						3/22/99	02:10:39P
BR03A	21						3/23/99	08:50:32A
BR03A	22						3/23/99	08:33:42A
BR03A	23						3/23/99	08:40:00A
BR03A	24						3/23/99	08:43:54A
BR03A	25						3/22/99	02:14:52P
BR03A	26						3/23/99	08:47:56A
BR03B	1						3/22/99	08:57:13A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR03B	2						3/22/99	08:51:52A
BR03B	3						3/22/99	08:49:42A
BR03B	4						3/22/99	08:46:44A
BR03B	5						3/22/99	08:50:50A
BR03B	6						3/22/99	08:53:04A
BR03B	7						3/22/99	08:59:11A
BR03B	8						3/22/99	09:03:32A
BR03B	9						3/22/99	09:10:24A
BR03B	10						3/22/99	09:12:28A
BR03B	11						3/22/99	09:14:30A
BR03B	12						3/22/99	09:21:30A
BR03B	13						3/22/99	09:17:50A
BR03B	14						3/22/99	09:24:05A
BR03B	15						3/22/99	09:26:02A
BR03B	16						3/22/99	09:27:44A
BR03B	17						3/22/99	09:29:32A
BR03B	18						3/22/99	09:32:26A
BR03B	19						3/22/99	10:12:14A
BR03B	20						3/22/99	10:08:01A
BR03B	21						3/22/99	09:58:44A
BR03B	22						3/22/99	09:56:02A
BR03B	23						3/22/99	09:57:15A
BR03B	24						3/22/99	09:54:14A
BR03B	25						3/22/99	09:52:06A
BR03B	26						3/22/99	09:44:19A
BR05	1						3/22/99	09:56:11A
BR05	2						3/22/99	10:05:56A
BR05	3						3/22/99	10:18:35A
BR05	4						3/22/99	10:22:17A
BR05	5						3/22/99	09:48:37A
BR05	6						3/22/99	09:52:25A
BR05	7						3/22/99	09:45:36A
BR05	8						3/22/99	09:41:22A
BR05	9						3/22/99	09:35:43A
BR05	10						3/22/99	10:10:17A
BR05	11						3/22/99	10:55:37A
BR05	12						3/22/99	10:51:52A
BR05	13						3/22/99	10:48:45A
BR05	14						3/22/99	10:42:25A
BR05	15						3/22/99	10:13:05A
BR05	16						3/22/99	09:31:53A
BR05	17						3/22/99	09:21:53A
BR05	18						3/22/99	09:11:08A
BR05	19						3/22/99	09:03:26A
BR05	20						3/22/99	08:56:53A
BR05	21						3/22/99	10:29:08A
BR05	22						3/22/99	10:35:41A
BR06	1						3/22/99	11:34:55A
BR06	2						3/22/99	11:13:55A
BR06	3						3/22/99	11:08:20A
BR06	4						3/22/99	11:05:49A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR06	5						3/22/99	11:01:30A
BR06	6						3/22/99	10:59:33A
BR06	7						3/22/99	10:54:47A
BR06	8						3/22/99	10:48:48A
BR06	9						3/22/99	10:43:28A
BR06	10						3/22/99	10:41:32A
BR06	11						3/22/99	10:39:25A
BR06	12						3/22/99	10:34:17A
BR06	13						3/22/99	11:20:50A
BR06	14						3/22/99	11:44:29A
BR06	15						3/22/99	12:27:31P
BR06	16						3/22/99	12:35:47P
BR06	17						3/22/99	12:31:44P
BR06	18						3/22/99	12:30:41P
BR06	19						3/22/99	12:24:49P
BR06	20						3/22/99	12:23:42P
BR06	21						3/22/99	11:57:43A
BR06	22						3/22/99	11:54:36A
BR06	23						3/22/99	11:52:37A
BR06	24						3/22/99	11:26:06A
BR06	25						3/22/99	11:38:35A
BR06	26						3/22/99	11:32:49A
BR10	1						3/23/99	09:15:47A
BR10	2						3/23/99	09:08:18A
BR10	3						3/23/99	09:03:00A
BR10	4						3/23/99	08:59:05A
BR10	5						3/23/99	09:12:01A
BR10	6						3/23/99	09:13:32A
BR10	7						3/23/99	09:09:22A
BR10	8						3/23/99	09:10:20A
BR10	9						3/23/99	08:28:22A
BR10	10						3/23/99	08:32:37A
BR10	11						3/23/99	08:34:52A
BR10	12						3/23/99	08:46:47A
BR10	13						3/23/99	08:47:34A
BR10	14						3/23/99	08:49:40A
BR10	15						3/23/99	08:44:57A
BR10	16						3/23/99	08:39:27A
BR10	17						3/23/99	08:37:11A
BR10	18						3/23/99	08:52:43A
BR10	19						3/23/99	08:56:34A
BR10	20						3/23/99	08:57:29A
BR10	21						3/23/99	09:18:08A
BR10	22						3/23/99	09:20:07A
BR12	1						3/22/99	10:26:09A
BR12	2						3/22/99	10:30:23A
BR12	3						3/22/99	10:42:12A
BR12	4						3/22/99	10:39:32A
BR12	5						3/22/99	10:40:02A
BR12	6						3/22/99	10:53:26A
BR12	7						3/22/99	10:55:42A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
BR12	8						3/22/99	11:00:31A
BR12	9						3/22/99	10:59:20A
BR12	10						3/22/99	11:03:56A
BR12	11						3/22/99	11:02:42A
BR12	12						3/22/99	11:10:24A
BR12	13						3/22/99	11:59:11A
BR12	14						3/22/99	12:01:14P
BR12	15						3/22/99	12:01:54P
BR12	16						3/22/99	10:35:48A
BR12	17						3/22/99	10:33:13A
BR12	18						3/22/99	10:45:40A
BR12	19						3/22/99	11:17:14A
BR12	20						3/22/99	11:20:02A
BR12	21						3/22/99	11:21:26A
BR12	22						3/22/99	11:22:23A
BR12	23						3/22/99	11:25:02A
BR12	24						3/22/99	11:32:35A
BR12	25						3/22/99	11:36:39A
BR12	26						3/22/99	11:45:31A
BR12	27						3/22/99	11:49:14A
FC02	1						3/23/99	01:03:16P
FC02	2						3/23/99	01:06:16P
FC02	3						3/23/99	01:08:55P
FC02	4						3/23/99	12:58:25P
FC02	5						3/23/99	01:22:48P
FC02	6						3/23/99	01:16:02P
FC02	7						3/23/99	01:19:08P
FC02	8						3/23/99	01:26:29P
FC02	9						3/23/99	01:38:54P
FC02	10						3/23/99	02:01:40P
FC02	11						3/23/99	01:41:43P
FC02	12						3/23/99	01:44:21P
FC02	13						3/24/99	07:42:19A
FC02	14						3/24/99	07:39:35A
FC02	15						3/24/99	07:36:17A
FC02	16						3/23/99	02:15:24P
FC02	17						3/24/99	08:09:16A
FC02	18						3/24/99	08:04:06A
FC02	19						3/24/99	08:00:42A
FC02	20						3/24/99	07:54:29A
FC02	21						3/24/99	07:57:27A
FC02	22						3/24/99	07:47:33A
FC02	23						3/23/99	01:31:43P
FC02	24						3/23/99	01:51:23P
FC02	25						3/23/99	01:35:50P
FC02	26						3/23/99	01:47:31P
FC03	1						3/23/99	10:27:08A
FC03	2						3/23/99	10:34:02A
FC03	3						3/23/99	10:40:30A
FC03	4						3/23/99	10:37:25A
FC03	5						3/23/99	11:00:55A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC03	6						3/23/99	11:36:08A
FC03	7						3/23/99	11:39:42A
FC03	8						3/23/99	11:42:42A
FC03	9						3/23/99	11:47:07A
FC03	10						3/23/99	11:49:56A
FC03	11						3/23/99	12:01:19P
FC03	12						3/23/99	11:54:19A
FC03	13						3/23/99	11:26:26A
FC03	14						3/23/99	11:21:38A
FC03	15						3/23/99	11:16:09A
FC03	16						3/23/99	11:11:27A
FC03	17						3/23/99	11:05:55A
FC03	18						3/23/99	11:58:19A
FC03	19						3/23/99	10:12:44A
FC03	20						3/23/99	10:20:22A
FC03	21						3/23/99	10:30:41A
FC03	22						3/23/99	10:47:56A
FC03	23						3/23/99	10:53:01A
FC03	24						3/23/99	10:56:14A
FC05	1						3/24/99	09:08:20A
FC05	2						3/24/99	09:05:25A
FC05	3						3/24/99	09:01:22A
FC05	4						3/24/99	08:59:14A
FC05	5						3/24/99	08:55:50A
FC05	6						3/24/99	08:50:28A
FC05	7						3/24/99	08:41:26A
FC05	8						3/24/99	08:39:12A
FC05	9						3/24/99	08:35:09A
FC05	10						3/24/99	08:29:22A
FC05	11						3/24/99	08:22:09A
FC05	12						3/24/99	08:44:28A
FC08	1						3/25/99	08:46:19A
FC08	2						3/25/99	09:36:58A
FC08	3						3/25/99	09:39:30A
FC08	4						3/25/99	09:41:26A
FC08	5						3/25/99	09:44:06A
FC08	6						3/25/99	09:46:36A
FC08	7						3/25/99	09:49:32A
FC08	8						3/25/99	09:51:42A
FC08	9						3/25/99	09:56:16A
FC08	10						3/25/99	10:01:39A
FC08	11						3/25/99	08:30:05A
FC08	12						3/25/99	09:59:21A
FC08	13						3/25/99	09:15:39A
FC08	14						3/25/99	09:23:19A
FC08	15						3/25/99	09:08:56A
FC08	16						3/25/99	09:01:01A
FC08	17						3/25/99	08:57:49A
FC08	18						3/25/99	09:31:47A
FC08	19						3/25/99	09:34:17A
FC08	20						3/25/99	09:29:10A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
FC10	1						3/24/99	09:48:52A
FC10	2						3/24/99	09:45:51A
FC10	3						3/24/99	10:07:40A
FC10	4						3/24/99	10:04:26A
FC10	5						3/24/99	10:14:17A
FC10	6						3/24/99	10:17:34A
FC10	7						3/24/99	10:11:04A
FC10	8						3/24/99	10:31:15A
FC10	9						3/24/99	10:42:05A
FC10	10						3/24/99	10:49:09A
FC10	11						3/24/99	10:52:57A
FC10	12						3/24/99	10:57:05A
FC10	13						3/24/99	10:59:44A
FC10	14						3/24/99	11:07:07A
FC10	15						3/24/99	11:09:56A
FC10	16						3/24/99	11:04:11A
FC10	17						3/24/99	11:38:28A
FC10	18						3/24/99	11:43:43A
FC10	19						3/24/99	11:40:57A
FC10	20						3/24/99	11:28:10A
FC10	21						3/24/99	11:16:44A
FC10	22						3/24/99	11:19:43A
FC10	23						3/24/99	11:50:58A
FC10	24						3/24/99	09:23:10A
FC10	25						3/24/99	09:54:20A
FC10	26						3/24/99	11:33:21A
FC10	27						3/24/99	11:24:35A
FC10	28						3/24/99	11:22:02A
FC10	29						3/24/99	11:13:24A
FC10	30						3/24/99	11:01:57A
FC10	31						3/24/99	10:20:32A
FC10	32						3/24/99	09:36:01A
FC10	33						3/24/99	09:33:38A
FC10	34						3/24/99	09:29:53A
LG01	1						3/22/99	01:15:53P
LG01	2						3/22/99	01:17:21P
LG01	3						3/22/99	01:18:29P
LG01	4						3/22/99	01:19:45P
LG01	5						3/22/99	01:21:15P
LG01	6						3/22/99	01:22:41P
LG01	7						3/22/99	01:26:07P
LG01	8						3/22/99	12:55:22P
LG01	9						3/22/99	12:57:25P
LG01	10						3/22/99	12:58:44P
LG01	11						3/22/99	12:51:40P
LG01	12						3/22/99	01:14:31P
LG01	13						3/22/99	01:13:27P
LG01	14						3/22/99	01:11:59P
LG01	15						3/22/99	01:04:33P
LG01	16						3/22/99	01:06:18P
LG01	17						3/22/99	01:07:26P

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG01	18						3/22/99	01:09:12P
LG01	19						3/22/99	01:52:54P
LG01	20						3/22/99	01:55:46P
LG01	21						3/22/99	01:56:46P
LG01	22						3/22/99	02:02:15P
LG01	23						3/22/99	01:37:26P
LG01	24						3/22/99	01:44:35P
LG01	25						3/22/99	01:47:31P
LG01	26						3/22/99	02:04:21P
LG02	1						3/23/99	09:25:09A
LG02	2						3/23/99	09:13:52A
LG02	3						3/23/99	09:07:53A
LG02	4						3/23/99	09:12:02A
LG02	5						3/23/99	09:10:06A
LG02	6						3/23/99	09:05:14A
LG02	7						3/23/99	08:51:14A
LG02	8						3/23/99	08:47:43A
LG02	9						3/23/99	08:43:36A
LG02	10						3/23/99	08:45:17A
LG02	11						3/23/99	08:41:07A
LG02	12						3/23/99	08:38:42A
LG02	13						3/23/99	08:36:14A
LG02	14						3/23/99	08:31:47A
LG02	15						3/23/99	08:30:12A
LG02	16						3/23/99	08:26:25A
LG02	17						3/23/99	09:48:50A
LG02	18						3/23/99	09:47:48A
LG02	19						3/23/99	09:42:00A
LG02	20						3/23/99	09:43:29A
LG02	21						3/23/99	09:45:43A
LG02	22						3/23/99	09:39:46A
LG02	23						3/23/99	09:29:42A
LG02	24						3/23/99	09:31:12A
LG02	25						3/23/99	09:32:54A
LG02	26						3/23/99	09:35:13A
LG02	27						3/23/99	09:01:00A
LG02	28						3/23/99	08:59:39A
LG02	29						3/23/99	08:58:28A
LG02	30						3/23/99	08:57:07A
LG02	31						3/23/99	08:55:09A
LG03	1						3/24/99	08:40:12A
LG03	2						3/24/99	08:41:12A
LG03	7						3/24/99	08:34:05A
LG03	9						3/24/99	08:35:31A
LG03	10						3/24/99	08:32:58A
LG03	12						3/24/99	08:36:28A
LG03	13						3/24/99	08:31:39A
LG03	14						3/24/99	08:30:18A
LG03	15						3/24/99	08:28:48A
LG03	16						3/24/99	08:27:40A
LG03	17						3/24/99	08:25:56A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG03	18						3/24/99	08:21:28A
LG03	19						3/24/99	08:37:53A
LG03	20						3/24/99	11:11:52A
LG03	21						3/24/99	08:48:36A
LG03	22						3/24/99	08:49:24A
LG03	23						3/24/99	08:42:53A
LG03	24						3/24/99	08:43:43A
LG03	25						3/24/99	08:45:12A
LG03	26						3/24/99	08:46:31A
LG04	1						3/23/99	11:21:11A
LG04	2						3/23/99	11:24:47A
LG04	3						3/23/99	11:26:00A
LG04	4						3/23/99	11:27:18A
LG04	5						3/23/99	11:31:58A
LG04	6						3/23/99	11:30:52A
LG04	7						3/23/99	11:29:33A
LG04	8						3/23/99	11:28:39A
LG04	9						3/23/99	10:55:58A
LG04	10						3/23/99	10:57:02A
LG04	11						3/23/99	11:06:08A
LG04	12						3/23/99	11:04:19A
LG04	13						3/23/99	11:02:41A
LG04	14						3/23/99	11:01:41A
LG04	15						3/23/99	10:59:54A
LG04	16						3/23/99	11:09:07A
LG04	17						3/23/99	10:52:55A
LG04	18						3/23/99	10:50:36A
LG04	19						3/23/99	10:47:30A
LG04	20						3/23/99	10:41:51A
LG04	21						3/23/99	10:58:05A
LG04	22						3/23/99	11:13:42A
LG04	23						3/23/99	11:07:13A
LG04	24						3/23/99	11:07:57A
LG04	25						3/23/99	11:17:41A
LG04	26						3/23/99	11:18:41A
LG05	1						3/23/99	09:52:06A
LG05	2						3/23/99	09:50:10A
LG05	3						3/23/99	09:53:16A
LG05	4						3/23/99	09:55:27A
LG05	5						3/23/99	09:54:16A
LG05	6						3/23/99	09:56:49A
LG05	7						3/23/99	09:59:17A
LG05	8						3/23/99	09:58:07A
LG05	9						3/23/99	10:01:04A
LG05	10						3/23/99	10:02:32A
LG05	11						3/23/99	10:05:21A
LG05	12						3/23/99	10:28:33A
LG05	13						3/23/99	10:19:49A
LG05	14						3/23/99	10:17:05A
LG05	15						3/23/99	10:08:42A
LG05	16						3/23/99	10:24:53A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG05	17						3/23/99	10:03:56A
LG05	18						3/23/99	10:06:41A
LG05	19						3/23/99	09:39:16A
LG06	1						3/22/99	01:34:39P
LG06	2						3/22/99	01:39:44P
LG06	3						3/22/99	01:41:26P
LG06	4						3/22/99	01:42:40P
LG06	5						3/22/99	01:44:00P
LG06	6						3/22/99	01:46:10P
LG06	7						3/22/99	01:47:53P
LG06	8						3/22/99	01:50:17P
LG06	9						3/22/99	01:52:19P
LG06	10						3/22/99	01:55:27P
LG06	11						3/22/99	01:27:29P
LG06	12						3/22/99	01:15:39P
LG06	13						3/22/99	01:13:57P
LG06	14						3/22/99	01:17:32P
LG06	15						3/22/99	01:24:10P
LG06	16						3/22/99	01:22:27P
LG06	17						3/22/99	12:56:20P
LG06	18						3/22/99	01:03:33P
LG06	19						3/22/99	01:07:11P
LG06	20						3/22/99	01:08:25P
LG06	21						3/22/99	01:10:16P
LG06	22						3/22/99	01:11:36P
LG06	23						3/22/99	01:05:47P
LG06	24						3/22/99	01:25:21P
LG06	25						3/22/99	01:29:40P
LG06	26						3/22/99	01:31:18P
LG06	27						3/23/99	02:10:26P
LG06	28						3/23/99	02:06:27P
LG06	29						3/23/99	02:05:18P
LG06	30						3/23/99	01:56:57P
LG08	1						3/22/99	09:55:25A
LG08	2						3/22/99	09:50:56A
LG08	3						3/22/99	09:46:16A
LG08	4						3/22/99	09:42:16A
LG08	5						3/22/99	09:39:11A
LG08	6						3/22/99	09:32:44A
LG08	7						3/22/99	09:37:44A
LG08	8						3/22/99	09:25:13A
LG08	9						3/22/99	09:23:33A
LG08	10						3/22/99	09:21:24A
LG08	11						3/22/99	09:19:28A
LG08	12						3/22/99	09:15:00A
LG08	13						3/22/99	09:12:48A
LG08	14						3/22/99	09:09:59A
LG08	15						3/22/99	09:03:09A
LG08	16						3/22/99	09:04:59A
LG08	17						3/22/99	09:01:18A
LG08	18						3/22/99	08:55:13A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG08	19						3/22/99	08:53:04A
LG08	20						3/22/99	08:51:47A
LG08	21						3/22/99	08:50:13A
LG08	22						3/22/99	08:47:17A
LG08	23						3/22/99	08:43:32A
LG08	24						3/22/99	08:41:41A
LG08	25						3/22/99	08:38:49A
LG08	26						3/22/99	08:35:37A
LG09	1						3/24/99	07:55:40A
LG09	2						3/24/99	07:57:03A
LG09	3						3/24/99	07:59:35A
LG09	4						3/24/99	07:58:09A
LG09	5						3/24/99	08:00:41A
LG09	6						3/24/99	07:53:49A
LG09	7						3/24/99	07:50:45A
LG09	8						3/24/99	07:49:44A
LG09	9						3/24/99	07:46:39A
LG09	10						3/24/99	07:42:13A
LG09	11						3/24/99	07:41:18A
LG09	12						3/24/99	07:40:08A
LG09	13						3/24/99	07:37:49A
LG09	14						3/24/99	07:34:14A
LG09	15						3/24/99	07:31:10A
LG09	16						3/24/99	07:35:43A
LG09	17						3/24/99	07:43:47A
LG09	18						3/24/99	08:10:48A
LG09	19						3/24/99	08:06:28A
LG09	20						3/24/99	08:07:39A
LG09	21						3/24/99	08:05:14A
LG09	22						3/24/99	08:04:08A
LG09	23						3/24/99	08:02:50A
LG09	24						3/24/99	07:51:59A
LG09	25						3/24/99	07:48:10A
LG09	26						3/24/99	07:44:56A
LG14	1						3/25/99	10:55:36A
LG14	2						3/25/99	10:41:56A
LG14	3						3/25/99	10:35:48A
LG14	4						3/25/99	10:06:15A
LG14	5						3/25/99	10:07:49A
LG14	6						3/25/99	10:08:59A
LG14	7						3/25/99	10:09:46A
LG14	8						3/25/99	10:10:44A
LG14	9						3/25/99	10:13:22A
LG14	10						3/25/99	10:14:51A
LG14	11						3/25/99	10:15:22A
LG14	12						3/25/99	10:24:34A
LG14	13						3/25/99	10:25:44A
LG14	14						3/25/99	10:38:09A
LG14	15						3/25/99	10:39:40A
LG14	16						3/25/99	10:45:41A
LG14	17						3/25/99	10:54:22A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
LG14	18						3/25/99	10:22:37A
LG14	19						3/25/99	10:23:29A
LG14	20						3/25/99	10:27:41A
LG14	21						3/25/99	10:30:20A
LG14	22						3/25/99	10:40:50A
LG14	23						3/25/99	10:28:25A
LG14	24						3/25/99	10:21:10A
LG14	25						3/25/99	10:11:52A
LG14	26						3/25/99	10:52:29A
LG15	1						3/23/99	10:00:13A
LG15	2						3/23/99	10:08:19A
LG15	3						3/23/99	10:04:10A
MC02	1						3/25/99	10:09:38A
MC02	2						3/25/99	10:13:25A
MC02	3						3/25/99	10:26:22A
MC02	4						3/25/99	10:28:53A
MC02	5						3/25/99	10:32:13A
MC02	6						3/25/99	10:36:32A
MC02	7						3/25/99	10:44:12A
MC02	8						3/25/99	10:46:43A
MC02	9						3/25/99	11:08:05A
MC02	10						3/25/99	11:02:03A
MC02	11						3/25/99	10:55:08A
MC02	12						3/25/99	11:24:41A
MC02	13						3/25/99	11:30:09A
MC02	14						3/25/99	11:36:33A
MC02	15						3/25/99	12:21:38P
MC02	16						3/25/99	12:00:24P
MC02	17						3/25/99	12:05:39P
MC02	18						3/25/99	12:17:49P
MC02	19						3/25/99	11:46:13A
MC02	20						3/25/99	11:33:13A
MC02	21						3/25/99	11:16:31A
MC02	22						3/25/99	11:13:55A
MC02	23						3/25/99	10:49:16A
MC02	24						3/25/99	10:21:30A
MC02	25						3/25/99	10:24:03A
MC02	26						3/25/99	10:16:52A
MC02	27						3/25/99	10:19:10A
MC02	28						3/25/99	10:36:02A
MC02	29						3/25/99	10:41:02A
MC02	30						3/25/99	11:10:45A
MC02	31						3/25/99	10:52:39A
MC02	32						3/25/99	10:58:15A
MC02	33						3/25/99	11:39:22A
MC02	34						3/25/99	11:42:36A
MC02	35						3/25/99	11:53:37A
MC02	36						3/25/99	11:57:27A
MC02	37						3/25/99	12:11:47P
MC02	38						3/25/99	12:15:05P
MC02	39						3/25/99	12:03:04P

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC03	1						3/25/99	09:19:59A
MC03	2						3/26/99	04:01:10P
MC03	3						3/25/99	09:18:33A
MC03	4						3/25/99	09:17:08A
MC03	5						3/25/99	09:15:58A
MC03	6						3/25/99	09:10:12A
MC03	7						3/25/99	09:08:57A
MC03	8						3/25/99	09:11:20A
MC03	9						3/25/99	09:12:22A
MC03	10						3/25/99	09:13:45A
MC03	11						3/25/99	09:22:02A
MC03	12						3/25/99	09:24:44A
MC03	13						3/25/99	09:23:54A
MC03	14						3/25/99	09:22:52A
MC03	15						3/25/99	09:25:58A
MC03	16						3/25/99	09:07:29A
MC03	17						3/25/99	08:59:05A
MC03	18						3/25/99	08:53:54A
MC03	19						3/25/99	08:52:41A
MC03	20						3/25/99	08:51:36A
MC03	21						3/25/99	08:50:21A
MC03	22						3/25/99	08:49:15A
MC03	23						3/25/99	08:48:17A
MC03	24						3/25/99	08:35:50A
MC03	25						3/25/99	08:39:25A
MC03	26						3/25/99	08:42:39A
MC05	1						3/26/99	03:50:19P
MC05	2						3/26/99	03:44:35P
MC05	3						3/26/99	03:41:51P
MC05	4						3/26/99	03:46:58P
MC05	5						3/26/99	10:15:10A
MC05	6						3/26/99	10:08:07A
MC05	7						3/26/99	03:36:36P
MC05	8						3/26/99	09:43:23A
MC05	9						3/26/99	09:33:55A
MC05	10						3/26/99	09:38:01A
MC05	11						3/26/99	09:30:26A
MC05	12						3/26/99	09:40:38A
MC05	13						3/26/99	09:22:20A
MC05	14						3/26/99	09:14:46A
MC05	15						3/26/99	10:00:09A
MC05	16						3/26/99	09:55:15A
MC05	17						3/26/99	09:25:54A
MC06	1						3/25/99	09:52:22A
MC06	2						3/25/99	09:50:40A
MC06	3						3/25/99	09:44:47A
MC06	4						3/25/99	09:26:42A
MC06	5						3/25/99	09:18:09A
MC06	6						3/25/99	09:25:23A
MC06	7						3/25/99	09:24:13A
MC06	8						3/25/99	09:11:38A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
MC06	9						3/25/99	09:08:29A
MC06	10						3/25/99	09:04:50A
MC06	11						3/25/99	09:03:13A
MC06	12						3/25/99	08:57:54A
MC06	13						3/25/99	08:52:53A
MC06	14						3/25/99	08:51:28A
MC06	15						3/25/99	08:50:30A
MC06	16						3/25/99	08:44:43A
MC06	17						3/25/99	08:42:54A
MC06	18						3/25/99	08:41:53A
MC06	19						3/25/99	08:40:00A
MC06	20						3/25/99	08:36:48A
MC06	21						3/25/99	09:38:36A
MC06	22						3/25/99	09:33:04A
MC06	23						3/25/99	09:35:39A
MC06	24						3/25/99	09:01:04A
MC06	25						3/25/99	08:59:26A
MC06	26						3/25/99	08:46:34A
MC07	1						3/25/99	11:04:18A
MC07	2						3/25/99	11:02:13A
MC07	3						3/25/99	10:56:30A
MC07	4						3/25/99	10:55:32A
MC07	5						3/25/99	10:48:41A
MC07	6						3/25/99	10:47:39A
MC07	7						3/25/99	10:46:14A
MC07	8						3/25/99	10:45:12A
MC07	9						3/25/99	10:43:18A
MC07	10						3/25/99	10:29:56A
MC07	11						3/25/99	11:13:25A
MC07	12						3/25/99	11:11:23A
MC07	13						3/25/99	10:53:16A
MC07	14						3/25/99	10:23:53A
MC07	15						3/25/99	10:20:41A
MC07	16						3/25/99	10:16:29A
MC07	17						3/25/99	09:55:09A
MC07	18						3/25/99	10:03:27A
MC07	19						3/25/99	10:05:23A
MC07	20						3/25/99	10:11:45A
MC07	21						3/25/99	10:13:46A
MC07	22						3/25/99	10:18:25A
MC07	23						3/25/99	10:22:21A
MC07	24						3/25/99	10:40:39A
MC07	25						3/25/99	11:10:01A
MC07	26						3/25/99	11:08:09A
YL01	1						3/24/99	08:15:11A
YL01	2						3/24/99	08:14:28A
YL01	3						3/24/99	08:13:54A
YL01	4						3/24/99	08:12:51A
YL01	5						3/24/99	08:04:54A
YL01	6						3/24/99	08:03:02A
YL01	7						3/24/99	08:02:23A

Presence of Federally-Listed Vernal Pool Crustaceans 1998/1999 Wet Season Survey #5

SUBBASIN	VERNAL POOL #	Branchinecta lynchi	Branchinecta sp.	Unknown Immature Branchinecta	Unknown Female Branchinecta	Lepidurus packardi	DATE	TIME
YL01	8						3/24/99	08:01:50A
YL01	9						3/24/99	08:01:01A
YL01	10						3/24/99	08:20:22A
YL01	11						3/24/99	07:52:26A
YL01	12						3/24/99	07:53:12A
YL01	13						3/24/99	07:58:15A
YL01	14						3/24/99	07:51:35A
YL01	15						3/24/99	07:50:05A
YL01	16						3/24/99	07:48:18A
YL01	17						3/24/99	07:47:27A
YL01	18						3/24/99	07:46:49A
YL01	19						3/24/99	07:46:00A
YL01	20						3/24/99	07:37:46A
YL01	21						3/24/99	07:44:53A
YL01	22						3/24/99	07:42:47A
YL01	23						3/24/99	07:41:37A
YL01	24						3/24/99	08:26:38A
YL01	25						3/24/99	08:25:28A
YL01	26						3/24/99	08:24:39A
YL02	1						3/23/99	11:25:14A
YL02	2						3/23/99	11:19:17A
YL02	3						3/23/99	11:20:05A
YL02	4						3/23/99	11:20:40A
YL02	5						3/23/99	11:22:06A
YL02	6						3/23/99	11:11:47A
YL02	7						3/23/99	11:09:55A
YL02	8						3/23/99	11:08:49A
YL02	9						3/23/99	11:07:59A
YL02	10						3/23/99	10:54:21A
YL02	11						3/23/99	10:56:40A
YL02	12						3/23/99	10:53:37A
YL02	13						3/23/99	10:52:51A
YL02	14						3/23/99	10:46:06A
YL02	15						3/23/99	10:48:44A
YL02	16						3/23/99	10:50:09A
YL02	17						3/23/99	10:58:23A
YL02	18						3/23/99	10:57:38A
YL02	19						3/23/99	11:00:22A
YL02	20						3/23/99	11:04:53A
YL02	21						3/23/99	11:13:33A
YL02	22						3/23/99	11:15:49A
YL02	23						3/23/99	11:52:45A
YL02	24						3/23/99	11:55:03A
YL02	25						3/23/99	12:00:46P
YL02	26						3/23/99	12:03:48P
YL02	27						3/23/99	12:05:44P
YL02	28						3/23/99	12:09:35P
YL02	29						3/23/99	12:12:46P
YL02	30						3/23/99	12:11:55P
YL02	31						3/23/99	12:14:24P

EXHIBIT 7

E-SIZE FIGURE OF THE DISTRIBUTION OF VERNAL POOL FAIRY SHRIMP WITHIN THE PLANNING AREA

EXHIBIT 8

E-SIZE FIGURE OF THE DISTRIBUTION OF VERNAL POOL TADPOLE SHRIMP WITHIN THE PLANNING AREA

EXHIBIT 9

E-SIZE FIGURE OF THE DISTRIBUTION OF MIDVALLEY FAIRY SHRIMP WITHIN THE PLANNING AREA