BRYTE RANCH CONSERVATION BANK

SACRAMENTO COUNTY, CALIFORNIA

2009 Biological Monitoring Report

Prepared For
Bryte Ranch LLC
P. O. Box 1139
Homewood, California 96141

Prepared By:
Marcus H. Bole & Associates
104 Brock Drive, Wheatland, CA 95692
October 28, 2009

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1.0 EXECUTIVE SUMMARY

The Bryte Ranch Conservation Bank is an approved vernal pool mitigation bank. The 573-acre project site is located in eastern Sacramento County near the intersection of Grant Line Road and Calvine Road (APNS 123-0050-001 and 123-0020-002).

Marcus H. Bole & Associates (MHBA) was retained by Mr. Brian Johnson, Bank Manager, to perform 2009 biological monitoring studies at the Bryte Ranch Conservation Bank at randomly selected vernal pool sites within the preserve. The 42 pools selected for 2009 were different from those selected in the 2004, 2005 and 2006 surveys so as to help incrementally provide baseline data for the entire site over time.

Biological monitoring studies included large branchiopod surveys (winter wet season sampling); rare plant surveys (spring and early summer); upland vegetation monitoring surveys (summer); and wildlife (Swainson's hawk and burrowing owl) surveys (spring/summer).

Large branchiopod species (fairy shrimp) surveys were conducted during the March 3 site visit. Vernal pool tadpole shrimp *(Lepidurus packardi)* were found in fifteen of the 42 features sampled. Several of these confirmations were based on the presence of shed skins floating in the water rather than captures of animals. Vernal pool fairy shrimp *(Branchinecta lynchi)* were captured in eight features. An unlisted species, mid-valley fairy shrimp *(Branchinecta mesovallensis)* was found in four features and another unlisted species, California fairy shrimp *(Linderiella occidentalis)*, was captured in at least five of the pools. Findings concerning the non-cladoceran vernal pool crustacean captured at Bryte Ranch during the 2009 surveys are further discussed in the *2008-2009 Wet Season Vernal Pool Shrimp Surveys of the Bryte Ranch Conservation Bank, Sacramento County, California, September 20, 2009,* LSA Associates, Inc., Project Number MBB0901 (See Enclosure D).

No rare plants were detected in any of the 42 randomly selected 2009 vernal pool sampling locations. Sensitive wildlife species observed during the 2004 and 2005 surveys conducted by May & Associates, including western spadefoot toad, and Ricksecker's water scavenger beetle, were not surveyed during the 2009 surveys due to dryer than normal site conditions.

Upland vegetation monitoring revealed that the site was highly grazed in 2009. This may be due to severe drought conditions in the Sacramento Valley since 2006, a grass fire that burned over 300 acres in September of 2007, and the fact that the grassland surveys were conducted after mowing had occurred. The survey results were influenced by these factors and may not accurately represent grazing conditions at the site.

2.0 INTRODUCTION

The 573-acre Conservation Bank is located in eastern Sacramento County near the intersection of Grant Line Road and Calvine Road. The Bryte Ranch Conservation Bank site encompasses vernal pool grassland habitats, including non-native annual grassland, vernal pool and vernal swale, seasonal wetland, ditch, and freshwater marsh habitats.

MHBA was retained by Mr. Brian Johnson, Conservation Bank Manager, to perform the 2009 biological monitoring studies at the Bryte Ranch Conservation Bank at randomly selected vernal pool sites within the preserve. The 42 pools selected for 2009 were different from those selected in the 2004, 2005 and 2006 surveys so as to help incrementally provide baseline data for the entire site over time. Biological monitoring studies included large branchiopod surveys (winter wet season sampling); rare plant surveys (spring and early summer); upland vegetation monitoring surveys (summer); and wildlife (Swainson's hawk and burrowing owl) surveys (spring/summer).

2.1 Project Site Location

The project site is located in eastern Sacramento County within portions of Sections 11, 13 and 14, Township 7 North, Range 6 East, M.D.M., located on the Elk Grove USGS Quadrangle map. Coordinates for the center of the 573-acre site are: 38.4627930º North, -121.2801885º West. The Conservation Bank is located on two County of Sacramento Assessor's Maps: APN 123-0050-001 is a 415± acre parcel and APN 123-0020-002 is a 155± acre parcel of vacant (undeveloped) land.

3.0 METHODS

3.1 Biological Monitoring Study Objectives

The objective of the 2009 biological monitoring study, in keeping with the two earlier surveys by May and Associates, Inc., was to assess the biological attributes of a subset of randomly selected vernal pools at the site to determine the overall health and functioning of the Bryte Ranch Conservation Bank as a whole. Pools selected in 2009 did not duplicate pools selected in 2004, 2005 or 2006.

Monitoring was conducted according to annual monitoring procedures as described in the Bank Agreement document and as requested by Mr. Brian Johnson, Bank Manager, in coordination with the Bank permitting agencies, the California Department of Fish and Game (CDFG), and the U.S Fish and Wildlife Service (USFWS).

In order to conduct this analysis, biologists/botanists from MHBA and LSA Associates compiled and reviewed project information; conducted large branchiopod monitoring, rare plant monitoring, upland vegetation monitoring; and wildlife monitoring; and consulted the Conservation Bank Manager and grazing lessee to get a sense of current and past land use practices on the bank. This analysis also includes recommendations

for future land management practices that could improve habitat quality for target biological resources of the site.

3.2 Pre-field Survey

The purpose of the pre-field investigation was to review existing information and to prepare a list of special status species with potential to occur in the vicinity of the project area. Sources of information included are as follows:

- California Department of Fish and Game's (DFG) Natural Diversity Data Base (CNDDB) record search of the Bank area (CNDDB 2009);
- California Native Plant Society's (CNPS) inventory of sensitive plant species in the Sacramento County area;
- Environmental documents (e.g., pertinent sections of the wetland delineation, Bank Prospectus and Enabling Instrument, as provided by Mr. Brian Johnson, Bank Manager);
- Unpublished files and reports by May & Associates, Inc. regarding biological resources occurring in the Bank area; and
- Other project information provided by the Client (e.g. past surveys and site investigations, observations from current (Johnson) and past (French) Bank managers and other experts).

3.3 Survey Dates and Survey Personnel

Four separate types of surveys were conducted at the Bryte ranch site in 2009: large branchiopod surveys; rare plant surveys; upland vegetation surveys, and focused wildlife (Swainson's hawk and burrowing owl) surveys.

The 2009 surveys of the Mitigation Bank were based on the protocol presented in the *United States Fish and Wildlife Service Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a) (1) (A) of the Endangered Species Act for Listed Vernal Pool Branchiopods* dated April 19, 1996. However surveys were not conducted every two weeks as recommended in the guidelines. Surveys were conducted early in the season, after vernal pools began to hold water, and later in the season, as they dried, according to the requirements specified in the Bryte Ranch Conservation Bank Operations and Management Plan.

Surveys for listed vernal pool fairy shrimp were conducted by LSA biologist David Muth with assistance from MHBA biologist David Bole on March 3 and April 7, 2009. A set of 42 pools were chosen based on the presence of water during the March 3 site visit (Permit #'s TE797234 & TE839213).

Aquatic sampling procedures for all pools consisted of two parts. The first is a visual examination of the water body to see if shrimp or amphibian larvae are swimming in the water column. Following visual inspection, a hand held net is pulled through the water to capture animals. The net is drawn through each sample site by holding the net mouth just

above the pool's bottom and walking through the sample site, moving the net through the water. The net is occasionally bumped along the pool's bottom to stir up any benthic organisms. The net is periodically removed from the water and checked for presence of aquatic species. Sampling is continued until the net is pulled through a sufficient portion of the water body to draw a conclusion about probable presence or absence of vernal pool shrimp and salamander larvae. Captured fairy shrimp were identified in the field based on male antenna and female brood pouch anatomy.

Rare plant surveys were conducted by MHBA botanist Tina Costella on April 12, 2009 (early spring surveys) with follow-up surveys on May 16 and June 20, 2009 (late spring and early summer surveys).

Upland vegetation and Residual Dry Matter (RDM) surveys were conducted by MHBA botanist Tina Costella concurrent with the late season rare plant surveys on June 20, 2009.

Burrowing owl and Swainson's hawk surveys were conducted by David Bole and Tina Costella using the approved survey protocols. Burrowing owl surveys were conducted during daytime hours in conjunction with the Swainson's hawk surveys during the spring and summer 2009.

3.4 Field Survey Methods

A total of 42 features were selected for sampling during 2009 from the 739 pools found within the Bryte Ranch Mitigation Bank property (excluding the pools sampled in 2004, 2005 and 2006 by May & Associates). Three of these features, the three largest pools, were subjectively chosen: 231, 664, and 742. The remaining pools were proportionately stratified to different areas of the property to ensure adequate sampling distribution (i.e. areas of the property with higher numbers of vernal pools were allotted a greater proportion of those selected for the 2009 surveys). These pools were selected within each stratified area by using a random number table to generate and select the sampling location.

3.5 Large Branchiopod Survey Methods

Large branchiopod survey sampling followed established USFWS wet-season sampling survey protocol. The inundated areas of the seasonal wetland were sampled using an 80-µm mesh size dip net. The net was moved through the water in a series of sweeping motions to collect aquatic organisms from the entire water column. The contents of the net were carefully examined for the presence of large branchiopods and other macroscopic invertebrates. This process was repeated until the inundated area had been thoroughly sampled to maximize the probability of large branchiopod detection. Reference specimens of large branchiopods were collected for positive identification under a microscope.

3.6 Rare Plant Survey Methods.

Special-status plant species identified during the data compilation as having the potential to occur on the study site were targeted during field surveys. Field surveys for special-status plants followed CDFG-recommended survey methods, as recommended by the California Native Plant Society (CNPS 1983, revised 2001) and Nelson (1987), and encompassed the entire project site.

For this study, each plant species encountered was identified to the extent necessary to determine if it has any legally protected status. Plants were identified using identification keys in The Jepson Manual (Hickman 1993) and recorded in field notes. Careful identification of all species encountered was conducted to help ensure that special-status plant species were not inadvertently overlooked because they were not targeted for surveys.

Three rare plant surveys were conducted in early spring. Rare plant surveys were timed to coincide with maximum spring blooming periods and a late spring survey was timed to coincide with detection of the later blooming special status species. A follow-up late season rare plant survey was also conducted concurrent with the upland plant survey on June 20, 2009.

3.7 Upland Vegetation Monitoring Methods

Upland range conditions were monitored by conducting ocular estimates of Residual Dry Matter (RDM) (Guenther 1998) throughout the site and following RDM monitoring guidelines recommended by Bartolome et al., (2002). In addition to visual estimates of RDM, a total of 6 plots were clipped, dried, and weighed for estimating RDM and annual rangeland condition (Bartolome et al., 2002). The results of the clip plots are presented in Table 1, Section 4.3.

Upland areas were assessed visually for condition of ecosystem processes (mineral cycle, water cycle, community dynamics, and energy flow) based on the National Research Council (1994) guidelines to monitor rangeland health. Although Residual Dry Matter is widely used throughout the Western States as a tool to monitor and manage annual rangelands, it is often ineffective in determining appropriate restoration and management actions for grassland habitats, especially management of native grasslands (Stromberg and Kephart 1996, Burkhardt 1997, Barry 1998, Sayre 2001). Management recommendations are based on our professional opinion of the potential for this site to be restored and managed for native grasses and associated species.

3.8 Wildlife Monitoring Methods

Wildlife monitoring followed established USFWS and DFG survey protocol for Swainson's hawk and California burrowing owl, as described below.

3.8.1 Burrowing Owl Survey Methods

Burrowing owl den searches involved walking all parts of the site with denning potential to look for ground squirrel or other burrows that might have been in use by burrowing owls. Most of the site was searched despite the prevalence of vernal pools and saturated soils, which would normally be expected to preclude burrowing owls. Of particular focus were fence lines and the tops and sides of topographic rises. Den searching occurred during the spring and summer 2009.

Breeding season surveys entailed visiting the site around dawn and/or dusk, twice during the breeding season (April through mid July). Both den surveys, and the breeding-season surveys were conducted in the evening from 1 hour before sunset and/or dawn, generally about 45 minutes prior to sunset/dawn, to help detect owl activity if owls were present.

3.8.2 Swainson's Hawk Survey Methods

The protocol for Swainson's hawk surveys for this project (as required by the mitigation agreement) was to spend a minimum of 2 hours during each of 5 visits during the breeding season of April through August either walking the site or driving the perimeter of the site and surrounding areas scanning with binoculars. David Bole and Tina Costella walked the site on the April, June, July, and August 2009 surveys. When it became apparent that the site was too large to cover on foot (i.e. that it was too difficult to be in enough locations enough of the time to get any sense of Swainson's hawk presence and use), it was decided that it was best to drive the surface roads around the site. The surface roads lie along only small portions of the site, but every publicly accessible surface road that came even close to the site was driven slowly in search of Swainson's hawks on the wing. Stopping repeatedly to scan with binoculars, and depending on activity, it was possible to make from 2 to 5 circuits around the site in a two-hour period. Circuits were driven alternately clockwise and counterclockwise. Figure 2 shows the driving survey route.

The April visit was conducted between 0800 and 1000, the June visit between 0900 and 1100, the July visit between 1200 and 1400, the July 14 visit between 1100 and 1300, and the August 23 visit between 1100 and 1200.

4.0 RESULTS

Surveys for each of these biological resources were conducted according to accepted survey methodologies: monitoring for branchiopod, USFWS published survey protocols for large branchiopod wet season sampling, for vegetation (CDFG 1998 and Nelson 1987), and CDFG approved survey protocol for California burrowing owl and Swainson's hawk surveys. Surveys were conducted during the appropriate detection period for the target group of species.

4.1 Results of Large Branchiopod Monitoring

The 2008-2009 Northern California rainy season was late and short. Many features did not hold water for the period of time necessary to support listed vernal pool crustaceans through to adulthood. The pools at Bryte Ranch that filled did so during late February rains. Most of these pools had dried by the time of the second visit and only four of the previously surveyed pools still had water on April 7, 2009.

The biologists were able to locate 42 features to sample during the March 3 site visit. All other features were too shallow or already dry. Vernal pool tadpole shrimp *(Lepidurus packardi)* were found in fifteen of the 42 features sampled. Several of these confirmations were based on the presence of shed skins floating in the water rather than captures of animals. Vernal pool fairy shrimp *(Branchinecta lynchi)* were captured in eight features. An unlisted species, mid-valley fairy shrimp *(Branchinecta mesovallensis)* was found in four features and another unlisted species, California fairy shrimp *(Linderiella occidentalis),* was captured in at least five of the pools. Findings concerning the non-cladoceran vernal pool crustacean captured at Bryte Ranch during the 2009 surveys are further discussed in the *2008-2009 Wet Season Vernal Pool Shrimp Surveys of the Bryte Ranch Conservation Bank, Sacramento County, California, September 20, 2009,* LSA Associates, Inc., Project Number MBB0901 (See Enclosure D).

These results of the 2009 vernal pool crustacean surveys of the Bryte Ranch Conservation Bank appear to be consistent with the previous survey results reported by May & Associates. The two listed species, vernal pool fairy shrimp and vernal pool tadpole shrimp, remain present on the site and continue to occur with the same frequency and density. The Bryte Ranch Conservation Bank continues to provide suitable and occupied habitat for these species.

4.2 Results of Rare Plant Monitoring

A list of special-status plants that are known or have the potential to occur within the vicinity of the project site was developed based on searches of the CNDDB (CNDDB 2009), CNPS databases (Skinner and Pavlik 1994), USFWS Species Lists, and on file information from MHBA. These species are either known from the vicinity of the project area, have known affinities for habitat types present at the project site, or are known from elsewhere in Sacramento County. No rare plants were detected in any of the 42 randomly selected 2009 vernal pool sampling locations.

Suitable habitat for all of the plant species listed in Table 2 (See Enclosure C) is present at the site. Survey timing was considered appropriate to detect any of the target vernal pool plants; however, no rare plants were detected in the randomly selected vernal pools that were sampled in 2009.

This result is consistent with the previous rare plant surveys conducted by May & Associates, Inc., anecdotal information provided by the Bank Manager (French pers. comm.), and with data presented in a prior botanical study of the site presumed to

have been conducted in approximately 1998 by Fred Hrusa, Botanist (French pers. comm.). Table 2 in Enclosure C presents a summary of plants observed by vernal pool sampling location.

4.3 Upland Vegetation Results

Upland vegetation monitoring revealed that the site was highly grazed in 2009. This may be due to current drought conditions in the Sacramento Valley, and also because upland grassland surveys were conducted after mowing had occurred. These results may be influenced by these factors and may not accurately represent grazing conditions at the site.

Between 576 and 1,536 lbs per acre of Residual Dry Matter (RDM) were found using clip plots during the 2009 surveys. The overall health of the range is considered low, based on the quality of the remaining summer forage, which includes less palatable species such as medusahead grass (*Taeniatherum caput-medusae*) and tarplant (*Holocarpha virgata* ssp. *virgata)*.

Between 600 lbs. /acre and 1,600 lbs. /acre of RDM were estimated visually on the Bryte Ranch in 2009, as compared to 1,200 lbs. /acre and 3,200 lbs. /acre of RDM in 2005. The visual estimates of RDM were substantiated by the RDM clip plot data (Table 1).

TABLE 1. CLIP PLOT ANALYSIS – RDM

Clip Plots	Vernal Pool Number	Residual Dry Matter (lbs ./acre)
1	229	1,536
2	664	960
3	231	768
4	329	576
5	314	576
6	709	576
Average		**831.5**

In general, the site was mowed prior to the RDM survey and collection, however, there was observed under-utilization of rangeland forage in some localized areas, and over-utilization of rangeland forage in others. For example, areas near the gate and corral where cattle are fed are almost devoid of palatable rangeland grasses. The presence of food, water troughs, and salt licks tends to congregate cattle in this area, resulting in localized over-utilization. In contrast, the portion of the site nearest to Grant Line Road tends to be underutilized, with a dense upland vegetation layer of tarweeds, medusahead, and California brome. At present, no water and no salt licks are present in this area, and there are no cross fences to keep cattle from migrating

towards other portions of the site, therefore this area may be less heavily grazed by cattle than other portions of the site.

4.4 Sensitive Wildlife Species Results

The Bryte Ranch Mitigation Bank site continues to support habitat for several sensitive wildlife species, as it has in previous years. There is ample evidence of both sensitive and common fairy shrimp species on site. Although not observed this year during the fairy shrimp surveys, Ricksecker's water scavenger beetle and western spadefoot toad were inadvertently detected on site during surveys in 2005. Both the Ricksecker's water scavenger beetle and the western spadefoot toad are U.S. Fish & Wildlife Service species of concern. Their presence at the site is significant, and further substantiates the value of the Bank in supporting sensitive species. Western burrowing owls, first detected at the Bank in 2004, were further substantiated during focused 2005 surveys. The 2005 Swainson's hawk surveys further support the conclusion that the Bank provides important and suitable foraging habitat for the species, as described the 2005 survey results. During the 2009 surveys both the Swainson's hawk and the burrowing owl were observed foraging on site; however, there was no evidence that either species uses the site for nesting.

4.5 Results of Burrowing Owl (*Athene cunicularia*) Surveys - State Species of Concern

The burrowing owl is typically associated with open, dry annual or perennial grasslands, deserts and scrublands and in other open areas such as agricultural lands and old fields. These lands are characterized by low-growing vegetation that provides good horizontal visibility for hunting. Considered a subterranean nester and dependent upon burrowing mammals, most notably the California ground squirrel (*Spermophilus beecheyi*) in the Sacramento area, these owls typically live in colonies. Burrows are used for breeding, nesting, and brooding. Ground squirrel borrows were observed throughout the property.

During the spring and summer owl surveys, all sites where there was evidence of owl activity (foraging) were monitored. Burrows along a fence line located at 38.4665º N, -121.2717º W, indicated definite signs of burrowing owl use (pellets, prey remains, and whitewash, see Enclosure C, Photo Plate 4). Other locations throughout the property contain numerous medium diameter burrows capable of supporting burrowing owl use. Additionally there is one observance of a single burrowing owl, no age given, on CNDDB records for the Elk Grove quadrangle (occurrence # 1024, recorded October 2003). The sighting was near the intersection of Excelsior and Gerber Roads, which is approximately 2.3 miles to the northwest of Bryte Ranch. This single owl was observed using a network of ground squirrel burrows within this area.

There are numerous reports of burrowing owl sightings from local residents and biologists working in the area, and at least one burrowing owl was observed foraging within the southern portion of the property during spring vernal pool surveys.

4.6 Results of Swainson's Hawk (*Buteo swainsoni*) Surveys – State Threatened

The site is considered high quality suitable foraging habitat for Swainson's hawk. Although the species was only observed once foraging directly onsite during the 2009 surveys, 2005 survey results did note foraging Swainson's hawk occurrences on several nearby adjacent properties that front more than one side of the Bank. In addition, there are anecdotal accounts of Swainson's hawks foraging on site in 2004 (Steve French, and confirmed by ornithologists conducting a survey for tri-colored blackbirds in 2004).

The Swainson's Hawk occurs as a breeding species in open habitats throughout much of the western United States and Canada, and in northern Mexico. In California, breeding populations occur in desert, shrubsteppe, grassland and agricultural habitats. However, the overwhelming majority of the state's breeding sites are in two disjunct populations in the Great Basin and Central Valley (*California Partners in Flight Riparian Bird Conservation Plan 2004*). Migrating individuals move south through the southern and central interior of California in September and October, and north March through May. This hawk forages by soaring at low and high levels in search of prey. They also may walk on the ground to catch invertebrates and other prey, and they catch insects and bats in flight. Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves.

In Central California, about 85% of Swainson's hawk nests are within riparian forest or remnant riparian trees (Woodbridge 1985). However, the vast majority of home ranges consist of treeless agricultural lands used for foraging. The abundance and spatial distribution of riparian forest as well as high-quality foraging habitat, such as fallow fields and alfalfa fields, are both critical determinants of territory suitability.

Visits to the site were conducted at different times during the daylight hours to maximize the opportunity for hawk sightings. During the spring vernal pool surveys there was one confirmed sighting of a Swainson’s hawk foraging on the site and within the other grasslands in close proximity to Bryte Ranch.

A search of the California Natural Diversity Database turned up 90 records for Swainson's hawk nests on the nine quads centered on the Elk Grove quad (on which the project lies). The other eight quads include, clockwise from directly north: Carmichael, Buffalo Creek, Sloughhouse, Clay, Galt, Bruceville, Florin, and Sacramento East. The 90 records date back as far as 1979, but the majority is distributed across the years from the 1980s through the early 2000s.

5.0 DISCUSSION

Many of the following recommendations are from May and Associates, Inc. 2004 and 2005 monitoring reports since they are still applicable to current conditions at the site.

5.1 Land Management Recommendations (Grazing)

Based on the visual and clip plot RDM levels in 2009, Bryte Ranch appears highly grazed. The stocking rates are similar to previous years. The RDM values for 2009 are much lower than the amounts measured in 2004 and 2005. The low RDM levels and corresponding visual estimates of vegetation/range cover may be attributed to the current drought conditions in the Sacramento Valley. Also, upland grassland surveys were conducted after mowing had occurred. Additionally, a wildfire in September of 2007 that started offsite burned approximately 300 acres of onsite grasslands. Thus, these results may be influenced by these factors and may not accurately represent grazing conditions at the site.

There are two main problems with the range plants present at the ranch, medusahead and tarweed. Cal IPC (1999) considers medusahead a widespread List A-I most invasive wildland pest plant. Medusahead out-competes native grasses and forbs, and, once established, can reach densities of 1,000 to 2,000 plants per square meter (Bossard et al., 2000). After seed set, the silica-rich plants persist as a dense litter layer that prevents germination and survival of native species, ties up nutrients, and contributes to fire danger in summer. Because of its high silica content, medusahead is unpalatable to livestock and native wildlife except early in the growing season. The sharp awns can injure the eyes and mouths of livestock (Bossard et al., 2000). Mowing to reduce medusahead was conducted in late spring in the southeastern portion of the ranch, and may be effective in controlling the spread of this species if continued over time.

Tarweed *(Holocarpha virgata)* is a native grassland species that can periodically become problematic in rangeland settings. It is widely recognized that rainfall plays an important role in shifting rangeland composition towards annual grasses or towards annual forb species. During wet cycles, forbs such as tarweed, turkey mullein *(Ermocarpus seligews),* and vinegar weed *(Fthhoslema lanatum)* tend to become more dominant in the rangelands, while grasses are more dominant during dry years. Other factors that can affect rangeland composition include frequency of wildfires, presence of nitrogen, grazing pressure, and presence of RDM. The 2005 season, like the 2004 season, was reported to be particularly favorable for tarweeds, with heavy infestations of the species reported throughout the Central Valley and surrounding foothills. The Bryte Ranch, like the rest of the surrounding area, had a prevalence of this species. The Land Manager is currently conducting a mowing effort to help control tarweed, as well as reduce medusahead. The southeast portion of the site was mowed in late spring, and mowing will be conducted annually in summer in an effort to reduce tarweed at the ranch. Studies have suggested that mowing tarweed to 4 inches or less in May, followed by mowing in July, can reduce tarweed by as much as 90% (Perrier,

et. al. 1981, 1982). A multiple-year mowing program (suggested at 5 years) is underway to control the species at the site.

Overall, rangeland health is low based on the visual assessment of the ecosystem processes on the ranch. Use of Residual Dry Matter to monitor the upland habitat of the ranch is required, however, exclusive use of this monitoring tool would likely result in management towards a non-native annual grassland. Although RDM monitoring can provide basic information about grazing levels, it does not provide the necessary information to facilitate a change in site conditions towards a more native grassland system.

6.0 RECOMMENDATIONS

Based on our 2009 site observations, we have developed the following recommendations for land management of the site:

- Develop an annual grazing plan that controls the timing and intensity of the selected livestock (in this case, cattle). Continue land management actions that are currently being implemented at the site including moving water troughs to prevent livestock spot over-utilization, and installing cross fencing combined with seasonal movement of livestock into various pastures to prevent local over- and under-utilization. The effects of the annual land management actions, as well as the overall effect of the grazing plan should be monitored, and changes made annually, as necessary, to achieve long term landscape goals for the ranch.

- Continue a mowing program at the site**.** At present, the site is being mowed to control both medusahead and tarweed through repeated, carefully timed mowing prior to seed set of these two species. The results of the mowing program should be assessed in spring 2010, and adjusted according to the most effective timing, area, and based on site conditions experienced in 2010. For example, mowing of medusahead should be in late spring, after seed set but before seed heads have shattered (known as the "soft dough" stage of seed development). Seeds still on the plants are destroyed by mowing, while dispersed seeds lying on, or buried below, the soil surface are shaded, preventing germination. Likewise, a late spring, early summer, and possibly late summer mow, before tarweeds set seed, is recommended. Prior to mowing, a burrowing owl assessment should be conducted to help ensure that mowing does not disturb nesting of this species.

- Consider a control burn at the site if permitted. Burning may be a desirable alternative to mowing as a management tool for manipulating the landscape. However, we recognize that due to tightened air quality standards and weather restrictions, burning may not be possible at Bryte Ranch. Prescribed burning may be incorporated into the livestock grazing plan if allowed by the permitting agencies. Several studies have shown that burning stands of non-native annual grasses, medusahead in particular, prior to seed dispersal, is an effective control measure (Stromberg and Kephart 1996, Pollack and Kan 1998, Bossard et al.,

2000). If determined to be appropriate to the site, burns should be scheduled for late spring, after seed set but before seed heads have shattered (known as the "soft dough" stage of seed development). Seeds still on the plants are destroyed by the burn, while dispersed seeds lying on or buried below the soil surface are protected from the intense heat of the burn. With few seed reserves in the soil, medusahead abundance can be dramatically reduced if the seed input for even one year is eliminated.

- It is understood that the Bryte Ranch intends to mend a damaged drainage structure just offsite associated with an irrigation canal north of the property boundary that may reduce artificial water flows from entering the Bryte Ranch property. This maintenance activity is considered a positive enhancement of the site, reducing the amount of artificial (and unseasonable) flows into natural vernal pools. These artificial flows are thought to be changing the flora and fauna of the nearby vernal pools in an undesirable manner (i.e., the number of observed species were substantially less than in natural pools and included more non-native and undesirable species than in adjacent natural vernal pools). If this maintenance activity is found to substantially reduce artificial flows from entering the onsite ditch, no further ditch maintenance may be required. However, if the maintenance activities are ineffective at diverting artificial flows, approximately 1/3 of this ditch should be cleared of vegetation each year and dredged to provide more effective water control at the site.

- Enhancement of areas where ground squirrel burrows have the highest potential to support burrowing owls should be considered. Constructing artificial burrows and other habitat restoration efforts should be coordinated with the California Department of Fish & Game.

- The site may support California tiger salamander, an amphibian associated with seasonal wetlands. We recommend conducting additional surveys timed to coincide with winter/spring migration periods for the species (i.e. after first heavy rains) to conclude presence or absence. Continue also to monitor for Rickseeker's water scavenger beetle and western spadefoot toad, two species that were inadvertently detected onsite during the 2005 invertebrate surveys. These two species would likely require only passive management (i.e. maintaining vernal pool habitat on site).

- Continue the grassland restoration efforts that were initiated in 2006. A pilot seeding program involving the use of purple needle grass (*Nassella pulchra)* is showing promise. In coordination with the mowing effort, it appears that native species composition is increasing on site. Consider expanding the pilot seeding program.

- Consider re-evaluating several areas that were initially denied vernal pool status in 1998 due to the surveys being conducted late in the year. According to a letter from the USACE dated December 3, 1998, these late season surveys were

inconclusive due to time of the year and other factors (heavy grazing, ditching, field road, etc.). The recommendation made by the USACE was to perform spring surveys and compile a complete floral and faunal species list. The biological staff of Marcus H. Bole & Associates found evidence that these previously un-delineated areas exhibit soil, vegetation and hydrology typical of vernal pools (not wet clay flat or shallow marsh). Spring surveys should include sampling for vernal pool fairy shrimp as well as comprehensive botanical evaluations. Surveys should be coordinated with the USACE, CDFG and USFWS to ensure regulatory agency guidance results in sufficient information is collected to accurately determine the status of the previously un-delineated areas.

Please address all questions concerning this monitoring report to: Marcus H. Bole & Associates, Attn: Marcus Bole, 104 Brock Drive, Wheatland, CA 95692, phone: 530-633-0117, fax: 530-633-0119, and email: mbole@aol.com.

Respectfully Submitted,

Marcus H. Bole, Principal, Wetland Scientist
Senior Environmental Scientist

7.0 REFERENCES

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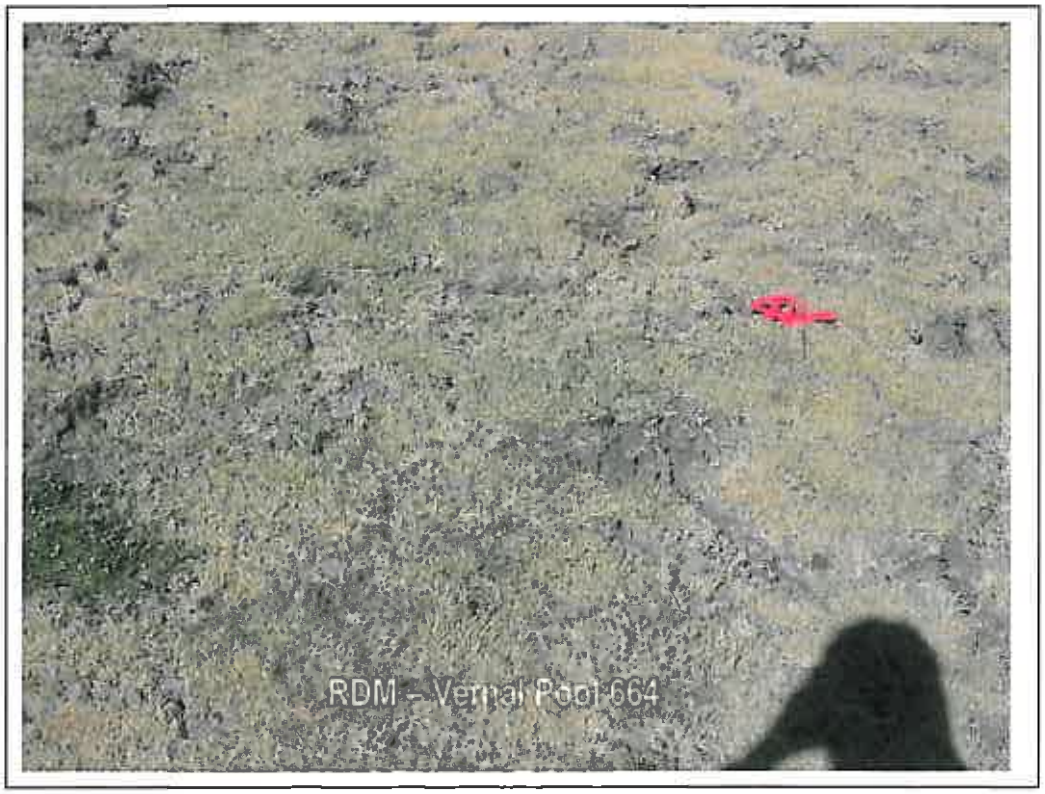
Enclosure A – Site Photos of Residual Dry Matter Plots



MARCUS H. BOLE & ASSOCIATES
104 Brock Drive, Wheatland, CA 95692
(530) 633-0117, email: mbole@aol.com

SITE: Bryte Ranch Conservation Bank Site,
Residual Dry Matter (RDM) Plots, 06/18/2009

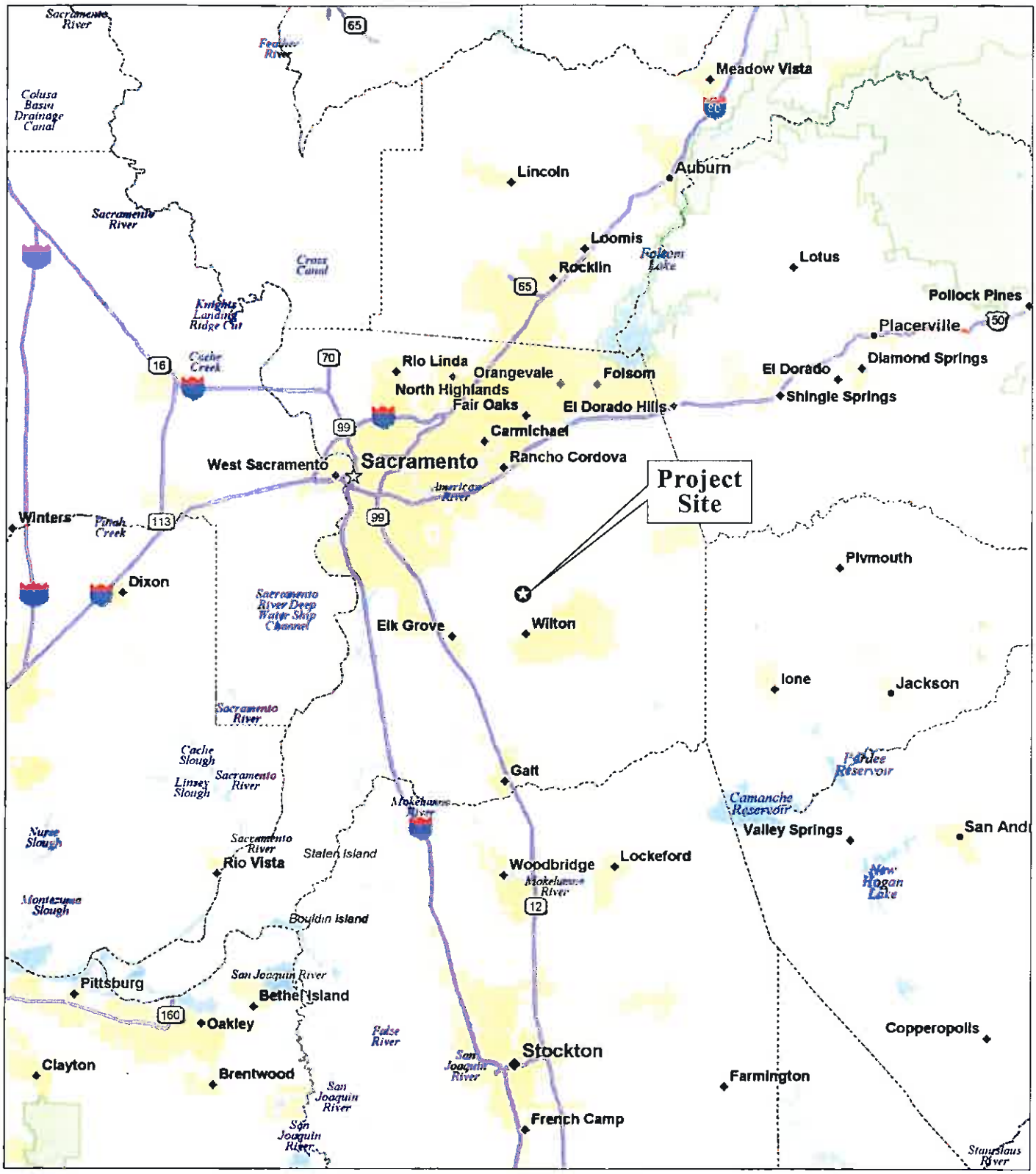
MARCUS H. BOLE & ASSOCIATES
104 Brock Drive, Wheatland, CA 95692
(530) 633-0117, email: mbole@aol.com

SITE: Bryte Ranch Conservation Bank Site,
Residual Dry Matter (RDM) Plots, 06/18/2009
PLATE: 2 of 3

MARCUS H. BOLE & ASSOCIATES
104 Brock Drive, Wheatland, CA 95692
(530) 633-0117, email: mbole@aol.com

SITE: Bryte Ranch Conservation Bank Site,
Residual Dry Matter (RDM) Plots, 06/18/2009
PLATE: 3 of 3

Enclosure B – Site Maps, Figures and Photos



LSA

FIGURE 1

N

0 5 10

MILES

SOURCE: ©2006 DeLORME. STREET ATLAS USA®2006.

Bryte Ranch

Regional Location

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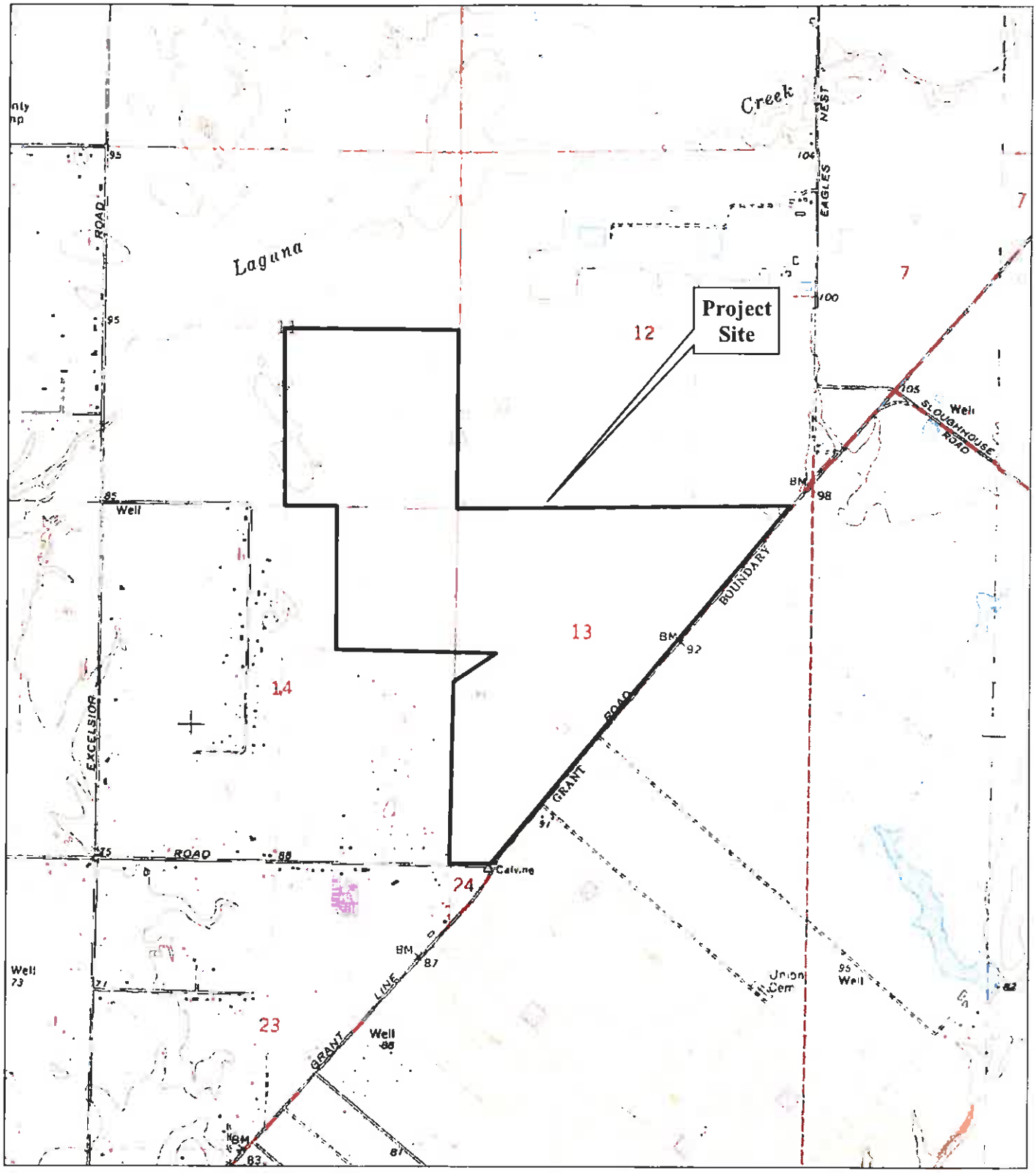

LSA

FIGURE 2

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FEET

SOURCE: USGS 7.5' Quad, *Elk Grove, California.*

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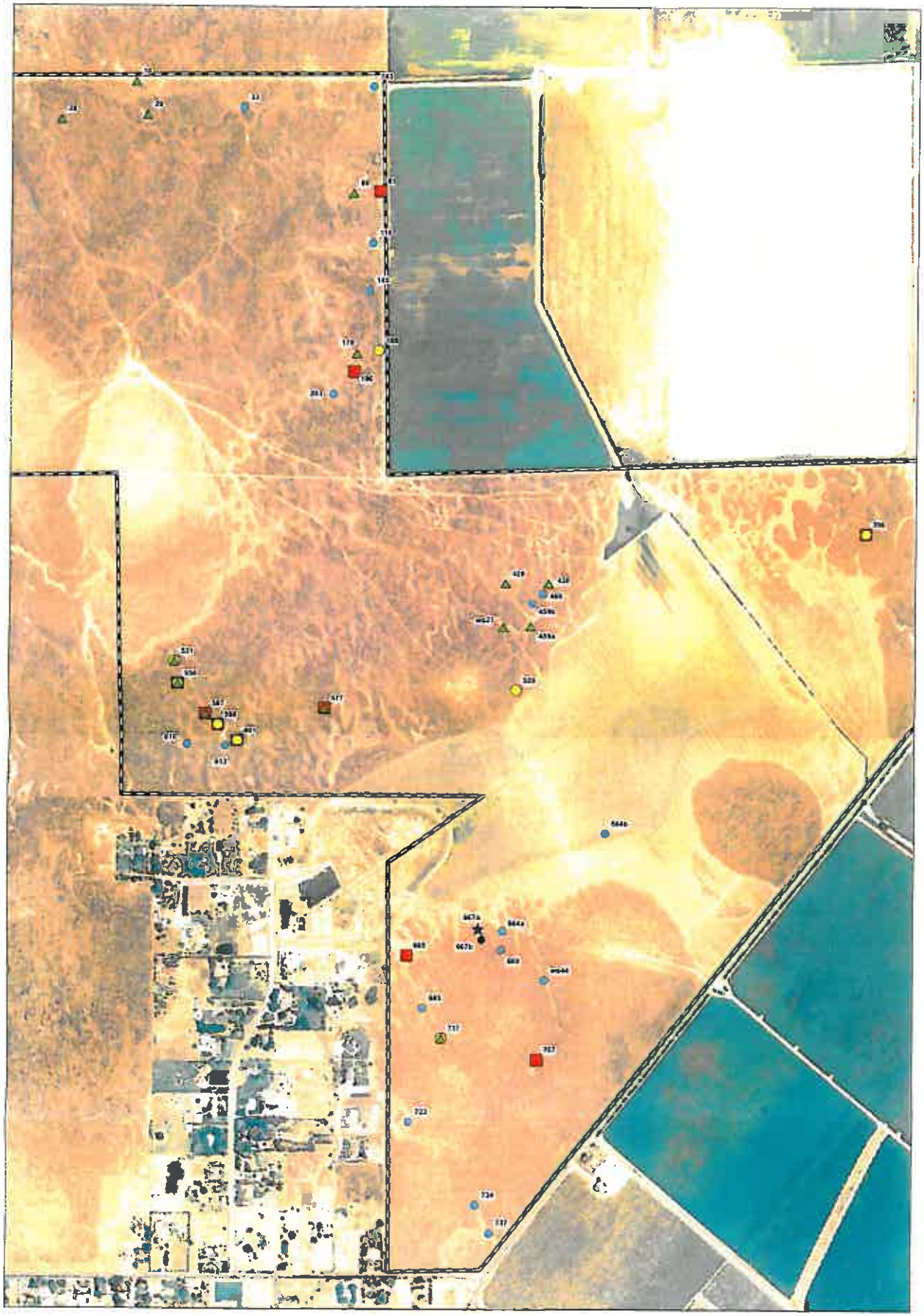
Bryte Ranch
Site Location



LSA

FIGURE 4

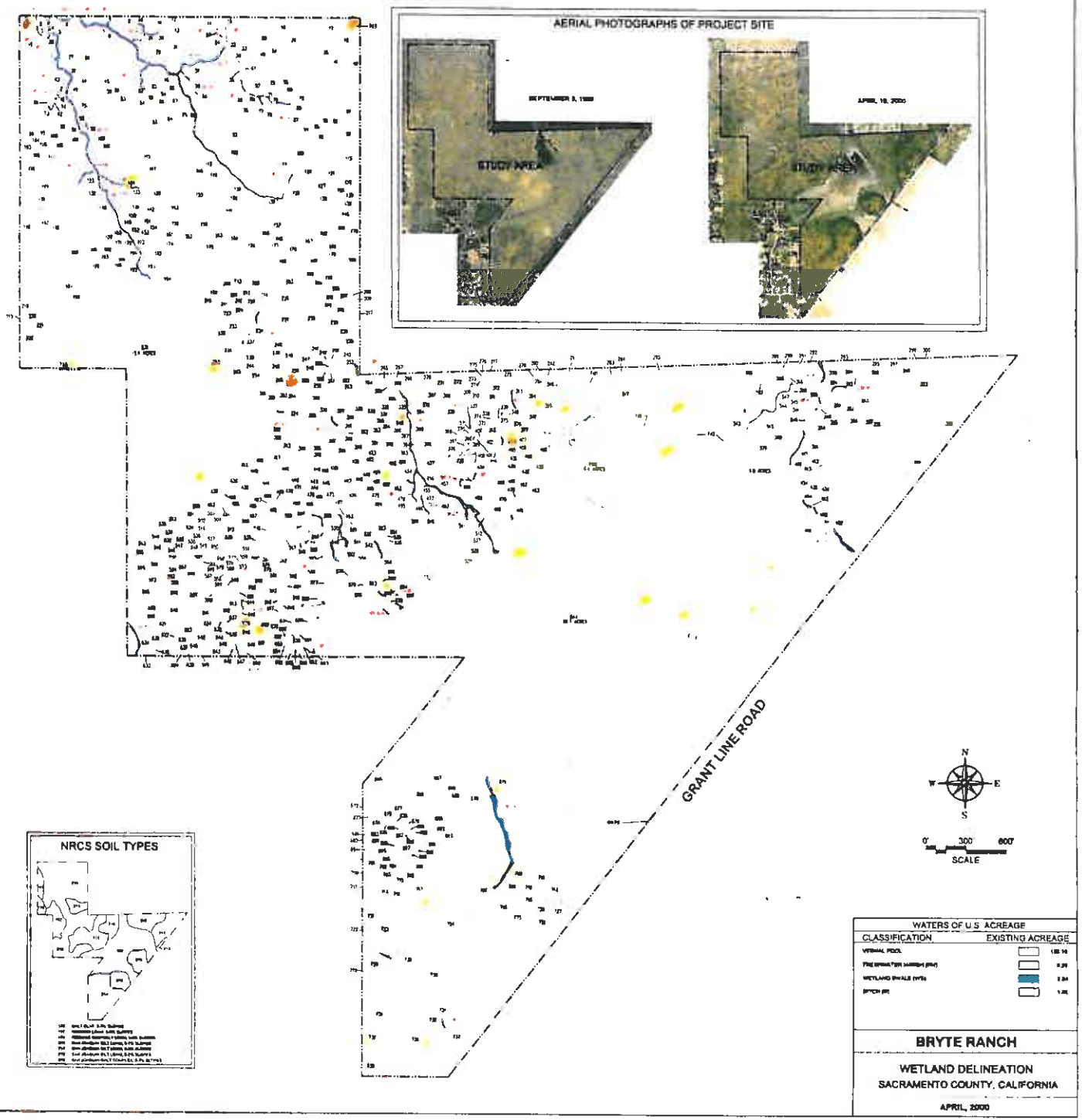
- Project Boundary
- Sample Point
- Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)
- Vernal Pool Tadpole Shrimp (*Lepidurus packardi*)
- Juvenile Branchinecta
- Midvalley Fairy Shrimp (*Branchinecta mesovallensis*)
- California Fairy Shrimp (*Linderiella occidentalis*)

0 150 300 600
FEET

Bryte Ranch Conservation Bank
Sacramento County, California

Vernal Pool Crustacean
Wet Season Surveys - 2009

SOURCE: Aerial Imagery from the United States Department of Agriculture NAIP (2005)
I:\MBB0901\GIS\Maps\VP Crustaceans\2009 Wet Season Figures\ 2009_VernalPoolSurveys.mxd (08/10/2009)

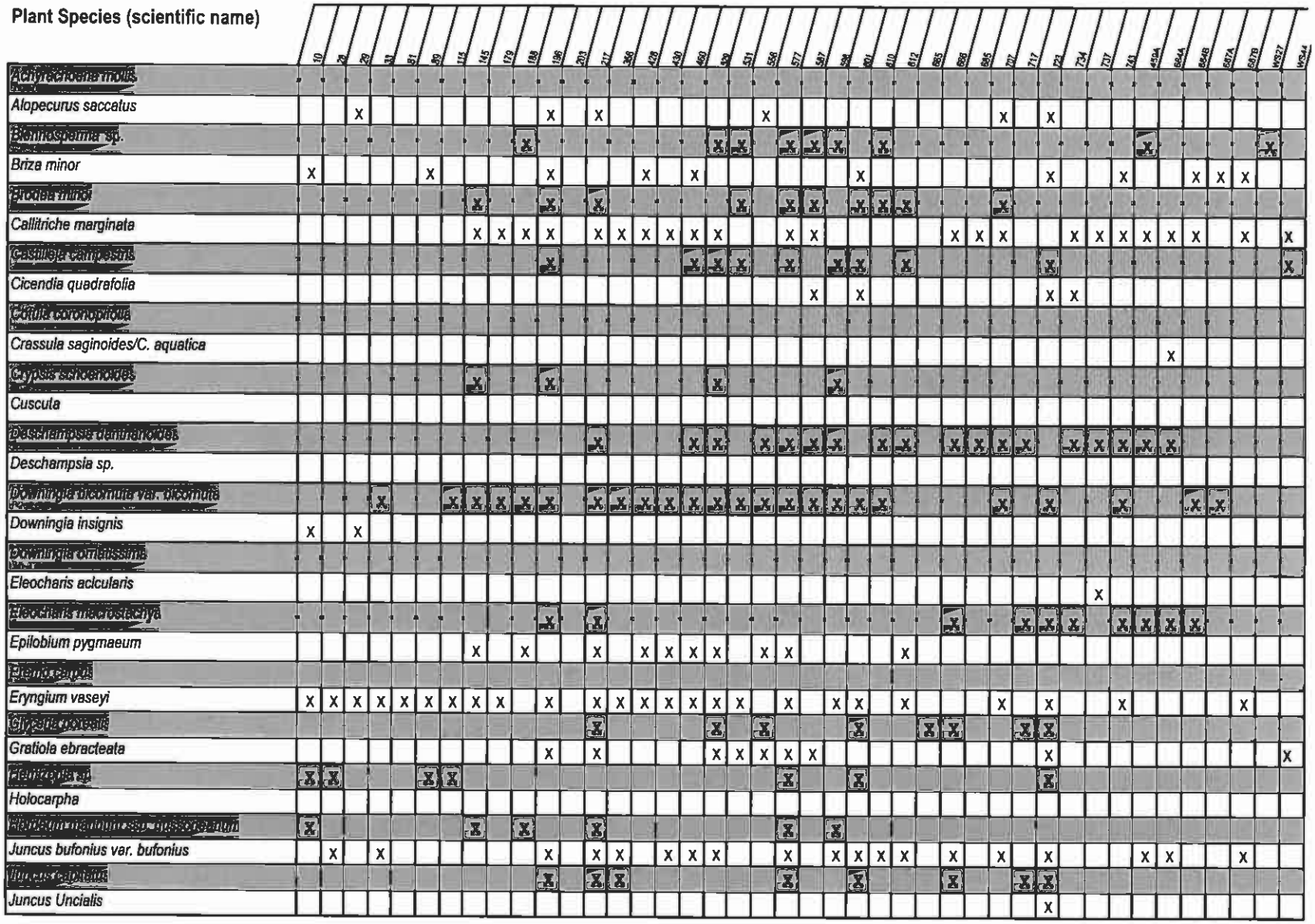

AERIAL PHOTOGRAPHS OF PROJECT SITE
STUDY AREA
STUDY AREA
GRANT LINE ROAD
NRCS SOIL TYPES
N
W
E
S
0'
300'
600'
SCALE
WATERS OF U.S. ACREAGE
CLASSIFICATION
EXISTING ACREAGE
BRYTE RANCH
WETLAND DELINEATION
SACRAMENTO COUNTY, CALIFORNIA
APRIL, 2000

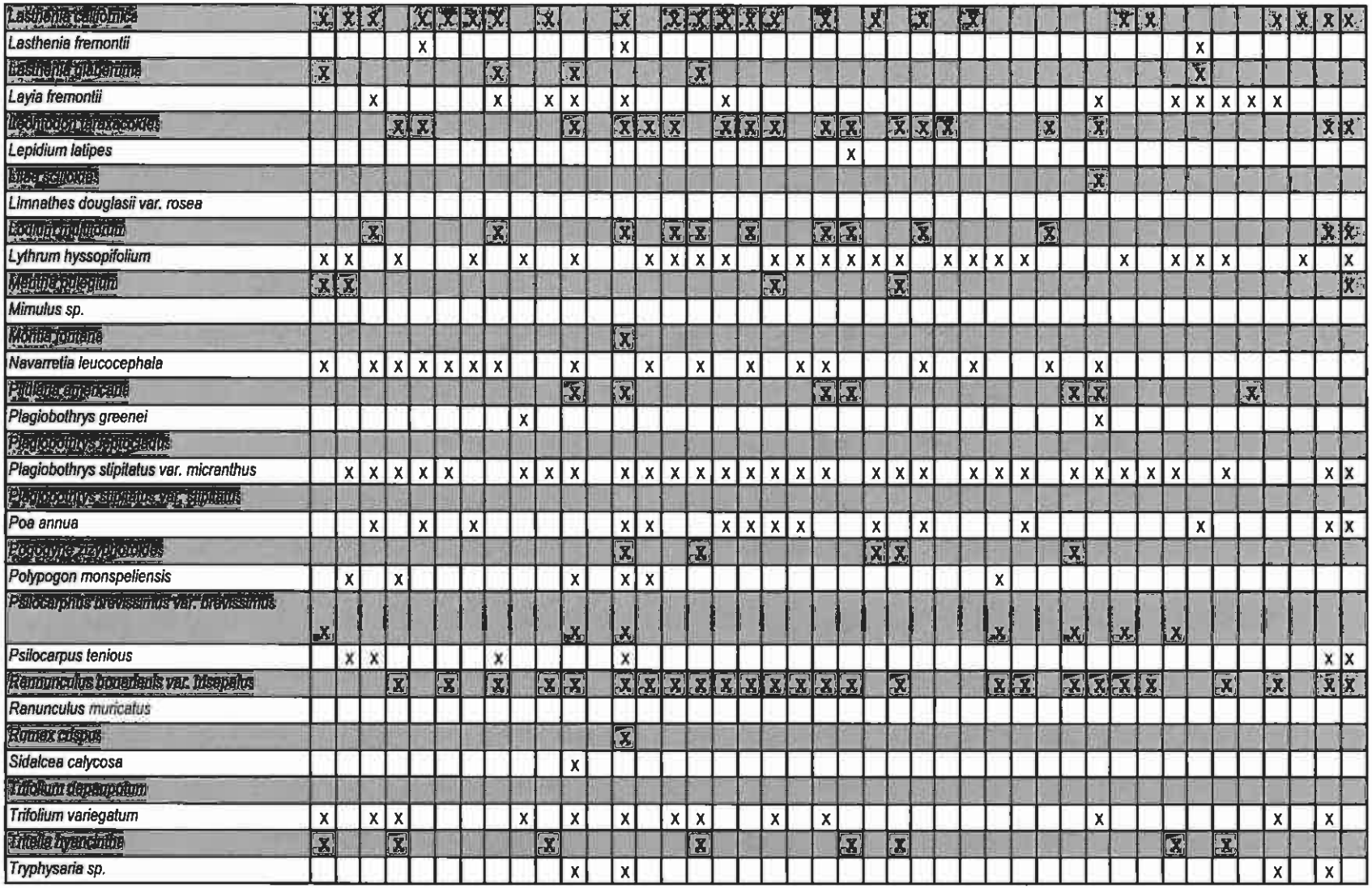
MARCUS H. BOLE & ASSOCIATES
104 Brock Drive, Wheatland, CA 95692
(530) 633-0117, email: mbole@aol.com

SITE: Bryte Ranch Mitigation Bank Site
Evidence of Burrowing Owl Activity
DATE: Summer 2009 PLATE: 4

Enclosure C – Plant Species Identified in Pools During Surveys in 2009

TABLE 2. PLANT SPECIES IDENTIFIED IN THE 42 VERNAL POOLS SURVEYED IN 2009





Enclosure D – Shrimp Survey by LSA Associates

2008-2009 WET SEASON VERNAL POOL SHRIMP SURVEYS OF THE BRYTE RANCH CONSERVATION BANK, SACRAMENTO COUNTY, CALIFORNIA

90-Day Report Submitted to:

U.S. Fish and Wildlife Service
Recovery Branch
2800 Cottage Way, Suite W2605
Sacramento, CA 95825

Surveys Conducted for:

Marcus Bole Associates
2400 Del Paso Road, Suite 250
Sacramento, CA 95834

Prepared by:

LSA Associates, Inc.
157 Park Place
Pt. Richmond, California 94801
(510) 236-6810

LSA Project No. MBB0901

LSA

September 30, 2009

TABLE OF CONTENTS

FIGURES

TABLES

INTRODUCTION

This report presents the results of vernal pool crustacean surveys conducted during the 2009 wet season on the Bryte Ranch Conservation Bank located in the southeastern corner of Sacramento County. In accordance with the requirements in the Bryte Ranch Conservation Bank Operations and Management Plan (French, date unknown) and the terms of the federal approvals for the establishment of the conservation bank, LSA Associates, Inc. (LSA) conducted non-protocol wet season surveys as part of the on-going monitoring for vernal pool invertebrates within the boundaries of the bank. Surveys are being conducted as 1) part of the baseline monitoring required under the Mitigation Bank's Management and Monitoring Plan and 2) as required under the bank's approved Restoration and Monitoring Plan. Two listed species of vernal pool crustaceans are known to occur on the Mitigation Bank property, the threatened vernal pool fairy shrimp (*Branchinecta lynchi*) and the endangered vernal pool tadpole shrimp (*Lepidurus packardi*). Invertebrate surveys were expected to include captures of these two listed species.

The surveys were conducted under the authority of permit TE-797234-6 issued to LSA by the U.S. Fish and Wildlife Service and with approval of Jason Hanni of the Sacramento USFWS Office. Preparation of this report within 90-days of the completion of field work is required as a condition of LSA's permit.

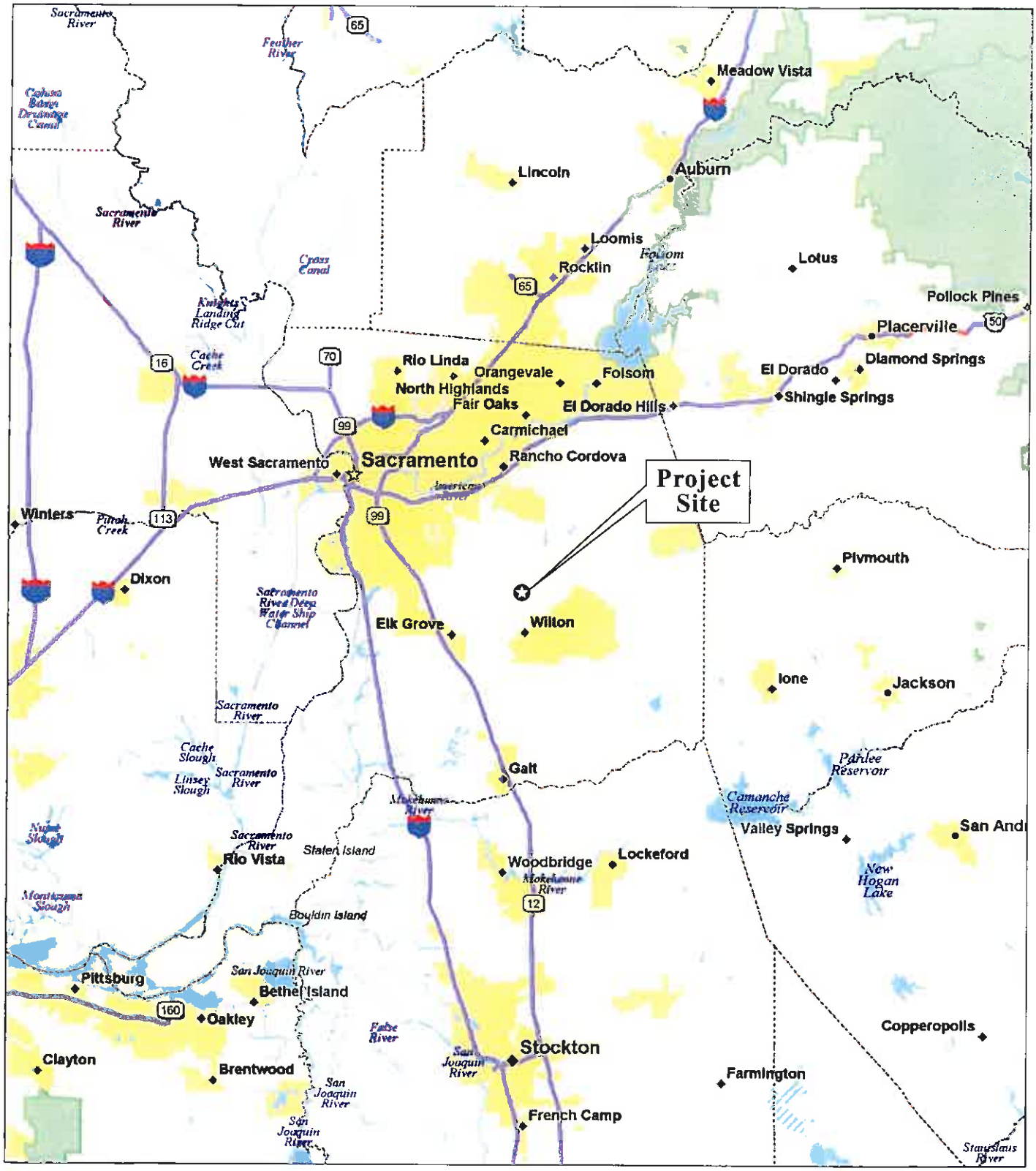
PROJECT LOCATION

The approximately 570-acre Mitigation Bank is located in southeastern Sacramento County just south of Laguna Creek. The property is bounded on the south by Calvine Road, on the east by Grant Line Road and open land used for grazing and/or agriculture to the north. The site can be found in Sections 15, 22, and 23, T7N, R6E on the Elk Grove 7.5 minute USGS quadrangle. The UTM coordinates for the center of the site are roughly 650,000 E and 4,259,000 N. Figures 1 and 2 present the regional and project site locations, respectively.

ENVIRONMENTAL SETTING

The Mitigation Bank consists of slightly rolling grassland terrace used to graze cattle and other livestock. The property startles the dividing line between the Deer Creek and the Laguna Creek watersheds. The southeastern portion of the site drains to Deer Creek and is relatively level at about 87 feet above mean sea level with two small hillocks rising above the 90 foot elevation along Grant Line Road. Minor topographical depressions within the area have formed vernal pools and larger low areas have formed vernal marshes. The northwestern portion of the site consists of more rolling terrain draining northwest to Laguna Creek through a large, centrally located swale. Additional vernal pools can be found on the eastern sides of the swale above the 95 feet elevation level.

The upland grass habitat is dominated by non-native grass species such as soft chess (*Bromus hordeaceus*), wild oats (*Avena* sp.), and small fescue (*Vulpia microstachys*) and ruderal forbs



LSA

FIGURE 1

0 5 10
MILES

SOURCE: ©2006 DeLORME. STREET ATLAS USA®2006.

Bryte Ranch

Regional Location

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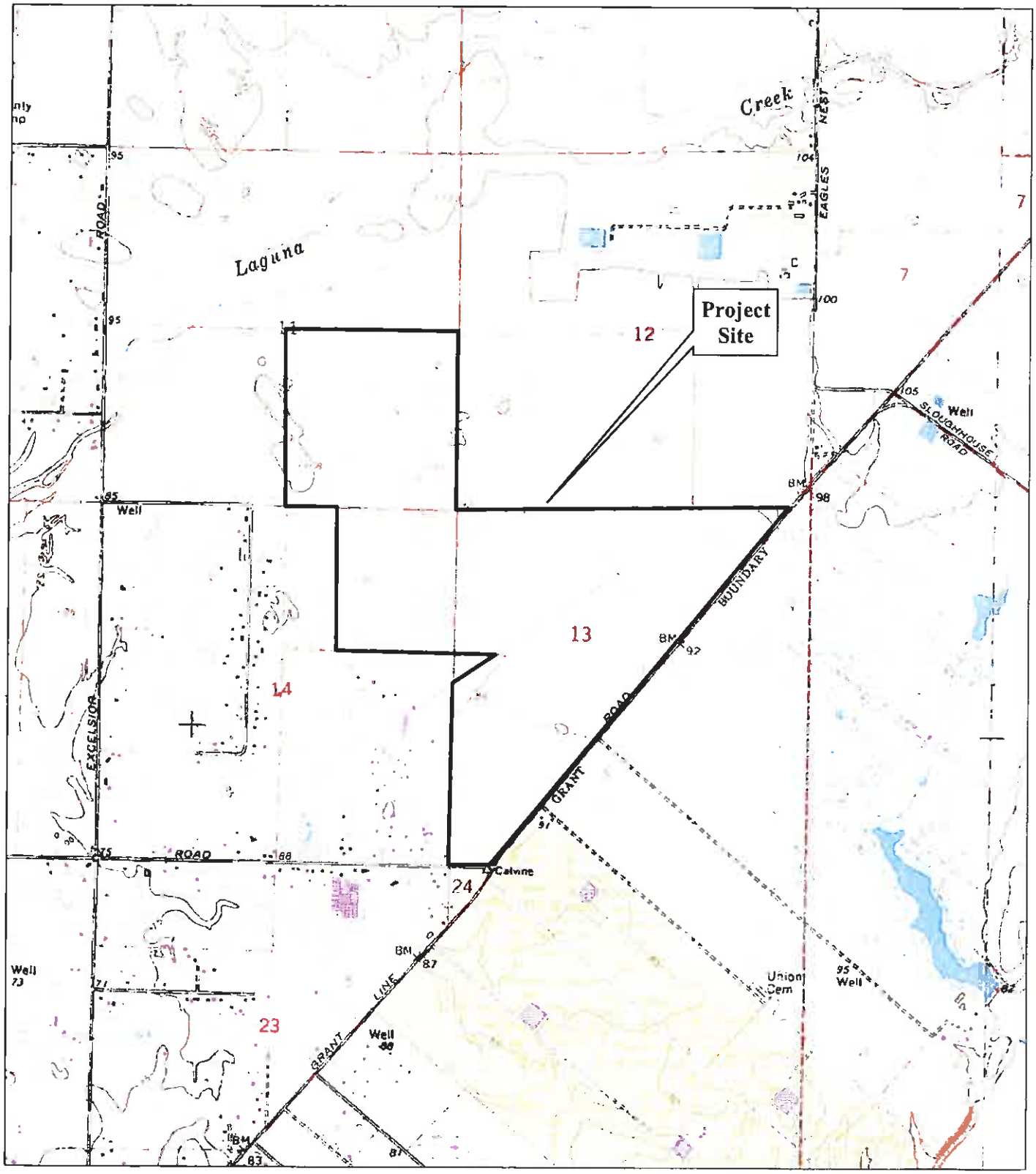

LSA

FIGURE 2

N

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FEET

SOURCE: USGS 7.5' Quad, *Elk Grove, California*

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Bryte Ranch
Site Location

including prickly lettuce (*Lactuca serriola*), smooth hawkbit (*Leontodon taraxacoides*), storksbill (*Erodium botrys*) and bur-clover (*Medicago polymorpha*), A few weedy native species such as fiddleneck (*Amsinkia menziesii*) and tarweed (*Holocarpha virgata*) are also present throughout the site. Vernal pools supported popcorn flower (*Plagiobothrys stipitatus*), goldfields (*Lasthenia glaberrima* and *L. fremontii*), and annual hairgrass (*Deschampsia danthonioides*).

Photographs of the site are provided in Figure 3.

PREVIOUS SURVEYS

The Mitigation Bank has been surveyed for vernal pool crustaceans on various occasions for several years. Surveys to monitor "large branchiopods" were conducted during 2004, 2005 and 2006 according to the annual monitoring procedures as described in the Bank Agreement document and as requested by the Bank Manager, in coordination with California Department of Fish and Game (CDFG) and the US Fish and Wildlife Service (USFWS). These monitoring surveys consisted of sampling the three largest pools (numbers 231, 664 and 742) and a subset of 37 randomly chosen vernal pools on the site each year. The previously surveyed pools, other than the three largest, were removed from the selection process in successive years. A summary of "large Branchiopod" captures for each year is included as Appendix B.

2004 Surveys

Surveys for vernal pool crustaceans were conducted on by May & Associates on Feb 9, 10, 23, and March 8, 2004. Vernal pool tadpole shrimp were captured in four of the 40 pools sampled on the Bryte Ranch site during these surveys. Three other species of "large branchiopods" were identified in 14 of the pools during the surveys. These other species included mid-valley fairy shrimp (*Branchinecta mesovallensis*) in three pools, California fairy shrimp (*Linderiella occidentalis*) in seven pools, and California clam shrimp (*Cyzicus californicus*) in two pools. Several specimens of *Branchinecta* that were found in six of the pools were determined "too small for identification to species".

2005 Surveys

The 2005 surveys were conducted by May & Associates on December 21, 2004 and January 17 and March 3, 2005. Vernal pool tadpole shrimp were captured in nine of the forty pools sampled on the Bryte Ranch site and vernal pool fairy shrimp were identified in seven. Other observations of "large branchiopods" included mid-valley fairy shrimp in five pools and California fairy shrimp in 21 pools. Specimens of Branchinecta "too small for identification to species" were found in three of the pools.

2006 Surveys

Surveys during 2006 were conducted on January 16, February 20, and March 29, 2006 by May & Associates. Four of the forty pools sampled on the Bryte Ranch site were found to support vernal pool tadpole shrimp. Vernal pool fairy shrimp were captured in seven of the pools on the site including all four of the pools that supported vernal pool tadpole shrimp. Other "large branchiopod" observations during 2006 included mid-valley fairy shrimp in four pools and California fairy shrimp in seven pools.

Photo 1: Looking northeast across Pool 664 from entry road on September 23, 2009

Photo 2: Looking south from entry road on September 23, 2009

LSA

FIGURE 3a

Bryte Ranch Conservation Bank
2009 Wet Season Listed Vernal Pool Crustacean Surveys
Site Photographs

Photo 3: Looking northeast at Pool 664 on September 23, 2009

Photo 4: Looking west at pool 667 on September 23, 2009

LSA

FIGURE 3b

Bryte Ranch Conservation Bank
2009 Wet Season Listed Vernal Pool Crustacean Surveys
Site Photographs

Photo 5: Looking west at a pool in the 400's or 500's on September 23, 2009

Photo 6: Looking south at a pool in the 500's on September 23, 2009

LSA

FIGURE 3c

Bryte Ranch Conservation Bank
2009 Wet Season Listed Vernal Pool Crustacean Surveys
Site Photographs

METHODS

The 2009 surveys of the Mitigation Bank, were based on the protocol presented in the *United States Fish and Wildlife Service Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for Listed Vernal Pool Branchiopods* dated April 19, 1996. However surveys were not conducted every two weeks as recommended in the guidelines. Surveys were conducted early in the season, after vernal pool began to hold water, and later in the season, as they dried, according to the requirements specified in the Bryte Ranch Conservation Bank Operations and Management Plan (French, date unknown).

Surveys for listed vernal pool fairy shrimp were conducted by LSA biologist David Muth with assistance from Marcus Bole and Associates biologist David Bole on March 3 and April 7, 2009. A set of 42 pools were chosen based on the presence of water during the March 3 site visit.

Aquatic sampling procedures for all pools consisted of two parts. The first is a visual examination of the water body to see if shrimp or amphibian larvae are swimming in the water column. Following visual inspection, a hand held net is pulled through the water to capture animals. The net is drawn through each sample site by holding the net mouth just above the pool's bottom and walking through the sample site, moving the net through the water. The net is occasionally bumped along the pool's bottom to stir up any benthic organisms. The net is periodically removed from the water and checked for presence of aquatic species. Sampling is continued until the net is pulled through a sufficient portion of the water body to draw a conclusion about probable presence or absence of vernal pool shrimp and salamander larvae. Captured fairy shrimp were identified in the field based on male antenna and female brood pouch anatomy.

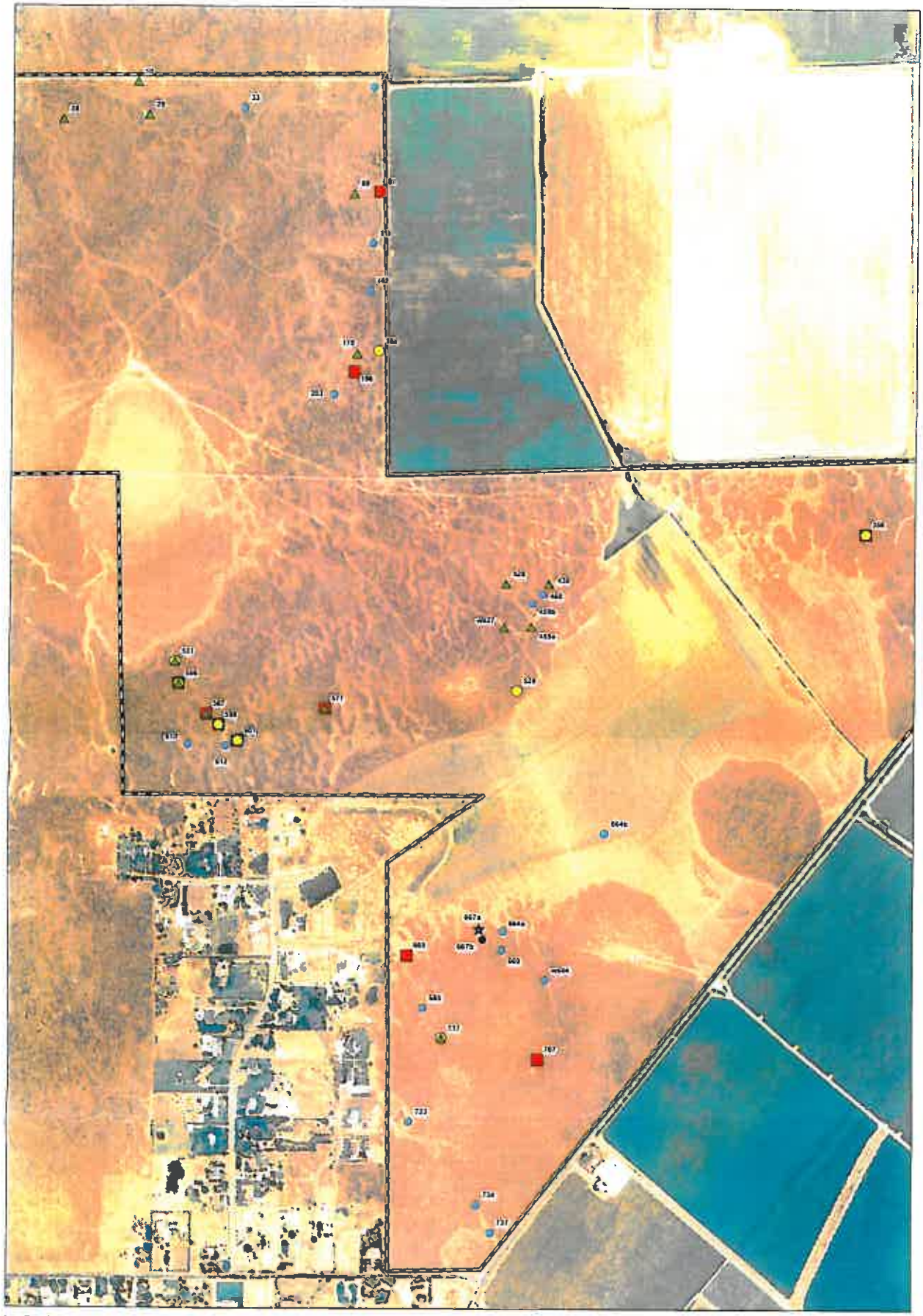
RESULTS

The 2008-2009 Northern California rainy season was late and short. Many features did not hold water for the period of time necessary to support listed vernal pool crustaceans through to adulthood. The pools at Bryte Ranch that filled did so during late February rains. Most of these pools had dried by the time of the second visit and only four of the previously surveyed pools still had water on April 7, 2009.

The biologists were able to located 42 features to sample during the March 3 site visit. All other features were too shallow or already dry. Vernal pool tadpole shrimp (*Lepidurus packardi*) were found in fifteen of the 42 features sampled. Several of these confirmations were based on the presence of shed skins floating in the water rather than captures of animals. Vernal pool fairy shrimp (*Branchinecta lynchi*) were captured in eight features. An unlisted species, mid-valley fairy shrimp (*Branchinecta mesovallensis*) was found in four features and another unlisted species, California fairy shrimp (*Linderiella occidentalis*), was captured in at least five of the pools. Table 1 provides a summary of non-cladoceran vernal pool crustacean captures at Bryte Ranch during the 2009 surveys. Figure 4 provides a map of the capture locations.

Table 1: Non-Cladoceran Branchiopod Captures at Bryte Ranch during 2009 Surveys

Pool Number	Vernal pool tadpole shrimp	Vernal pool fairy shrimp	Mid-valley fairy shrimp	California fairy shrimp	UnID'ed Branchinecta	Number of species present
10	3					1
28	3					1
29	2					1
33						0
81				2		1
89	1					1
115						0
145						0
179	1					1
188		3				1
196				7		1
203	2			3		2
217						0
356		1		6		2
428	3					1
430	3					1
460						0
529		2				1
531	1	1				2
556	1	2		1		3
577	1			4		2
587	1			2		2
598		3		23		2
601		1		10		2
610						0
612						0
665				3		1
666						0
685						0
707				2		1
717	1	2				2
723						0
734						0
737						0
743						0
459a	1					1
459b						0
664a						0
664b						0
667a			23			1
667b					5	1
WS27	1					1
WS44						0



LSA

FIGURE 4

- Project Boundary
- Sample Point
- Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)
- Vernal Pool Tadpole Shrimp (*Lepidurus packardi*)
- Juvenile Branchinecta
- Midvalley Fairy Shrimp (*Branchinecta mesovallensis*)
- California Fairy Shrimp (*Linderiella occidentalis*)

0 150 300 600
FEET

Bryte Ranch Conservation Bank
Sacramento County, California

Vernal Pool Crustacean
Wet Season Surveys - 2009

SOURCE: Aerial Imagery from the United States Department of Agriculture, NAIP (2005).
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CONCLUSION

These results of the 2009 vernal pool crustacean surveys of the Bryte Ranch Conservation Bank appear to be consistent with the previous survey results from 2004, 2005, and 2006. The two listed species, vernal pool fairy shrimp and vernal pool tadpole shrimp, remain present on the site and continue to occur with the same frequency and density. The Bryte Ranch Conservation Bank continues to provide suitable and occupied habitat for these species.

CERTIFICATION

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

David P. Muth/ September 30, 2009
Permit #'s TE797234 & TE839213

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APENDIX A

Field Notes

Bryte Rock 3/12
Sacto Co

1) 737 — No shrimp
108 x 18 — Sma 10's
12" — Orp 10's

2) 734 — Ø
18 x 30
6"

3) 723 — cop 10's
50 x 30
6"

4) 717 — B lynchi 2 — L [illegible] 1
50 x 35 — L occid 5
10 — cope 10's

5 695 — Dytiscid 1
30 x 15 — cop pd 10's
6"

6 665 — Lind 3
15 x 22 — cope 10's
12" — clad 10's

7 664 / 667 — B meso 20
18 x 20 10" — cope 10's

10) 664b ~~666~~ 20X35 4" B. sp. 5

9) 664c 50x12 6" cld 10's cope 10's

8) 666 30x20 6" Ø

11) WS44 35x20 10 Ø Ech'ph'cd

12 724 80x25 12" Cmd 2 Cope 10's L.pack 1

13 644 huge 50 away? 12' Cope 100's Clad 10's

14 524 50x28 10" B lychn, 2 cld 10's Cope 10's

WS27

15 140 X 15 10 Lop packed 3 sleds Cope 10's. Clad 10's dyfrnd 1

16 454a 45 X 30 10 L pack 1 sled Cope 10 Clad 10 dyfm 1

17 ~~459b~~ 40x20 5' Ø Clad 1 cope 1

18 30x25 6" clad 1 Cope 1

19 50 x 35 10 Lop. 3 sled ([illegible]) clad 10's cope 10's

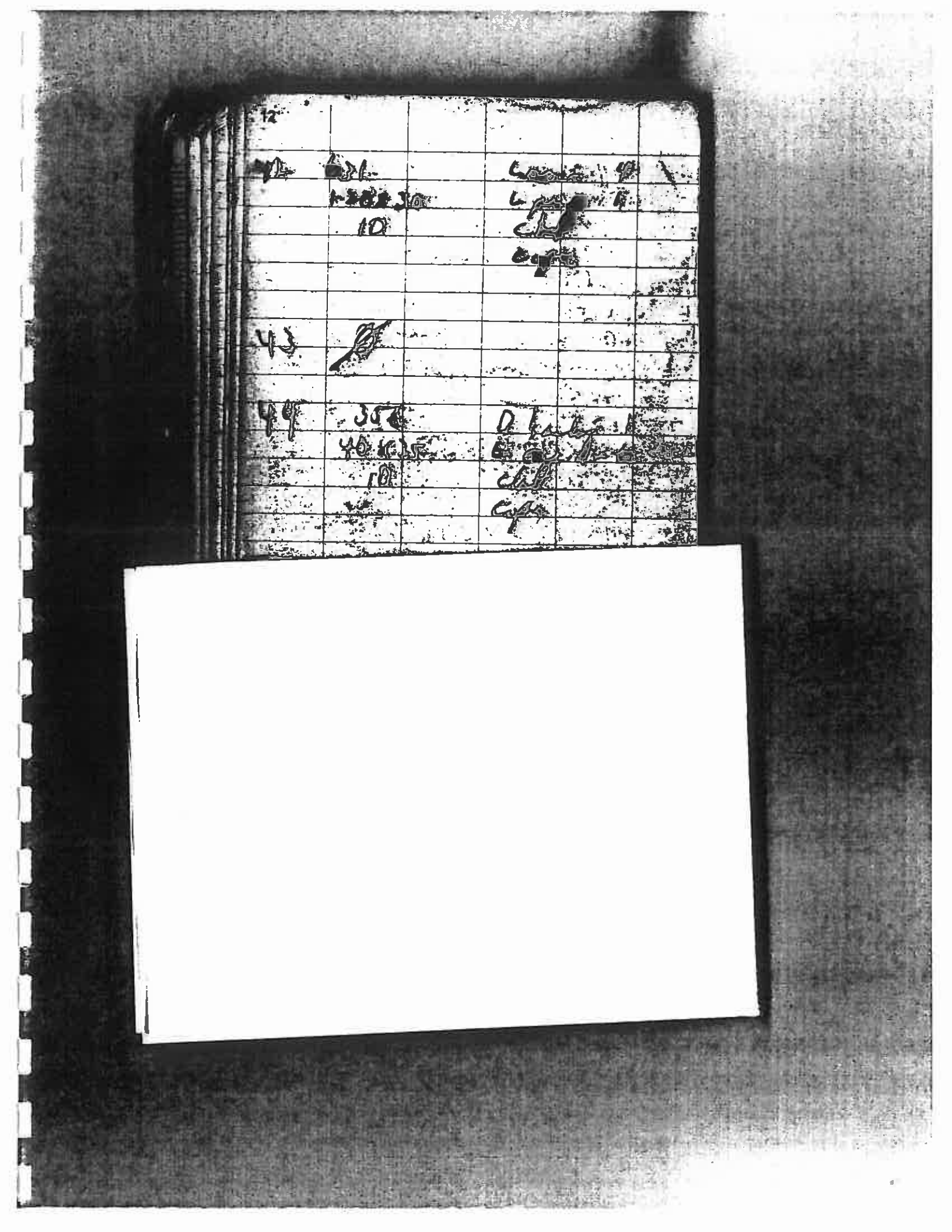
20 Lop 3 sled clad 10's cop 10's dyfm 1

21	262 50 X 25 10"	L. pukel. 2 clad 10's L. crocket 3
22	203 50 X 20 6"	clad 10's cope 10's
23	196 60 x 30 8"	L crocket 7 Clad 10 Cope 10
24	217 80 x 20 12	L pukel. 1 sled dyked 1 clad 10 cope 10
25	~~[illegible]~~ 179 60 X 40 6	B lynch 1 clad 10 cope 10 L.c 3
26	145 25 X 15 6	cld 10 cope 10

27	115 45 X 40 10	Clad 100's cope 1's
28	81 110 X 15 12"	L. occ 2 Clad 100 cop 10 Hyla 1
29	89 20 X 20 10	clad U cop 10 L pukel. 1 sled
30	743 100 X 60 14"	clad 100 cop 100
31	73 20 X 10 5"	cld 1 cope 1's dyked 1
32	29 70 x 18 10	clad 10's cope 1's L.c.p. Pack Sleds 2

33	10 20x25 10	L. parkus 1 Clad [illegible]'s Cope [illegible]'s Oyhund 1	skd2
34	28 30x20 10	L. opunda 3 Clad 10 Cope 10	

35	544 65 x 18 6"	B. lynchi 1 L. parkus 1 Clad 10's Cope 1's
36	556 40 x 15 6"	B. lynchi 2 L. occid. 1 L. parkus skd Clad 10's Cope 10's
37	587 100 x 120 10	L. occid. 2 L. pack 1 clad cope
38	598 40 x 20 6	B. lynchi 3 L. occid. 23 clad cope
39	610 70 x 25 7"	Ø
40	612 90 x 30 8"	Clad Cope L. occ. 10
	601 60 x 20 8"	B. lynchi 1 skd



Byte Rock Apr 17, 2059
162 mi

737 3" Pearl
10'x20' US

665 40x20' Pearl
1' US

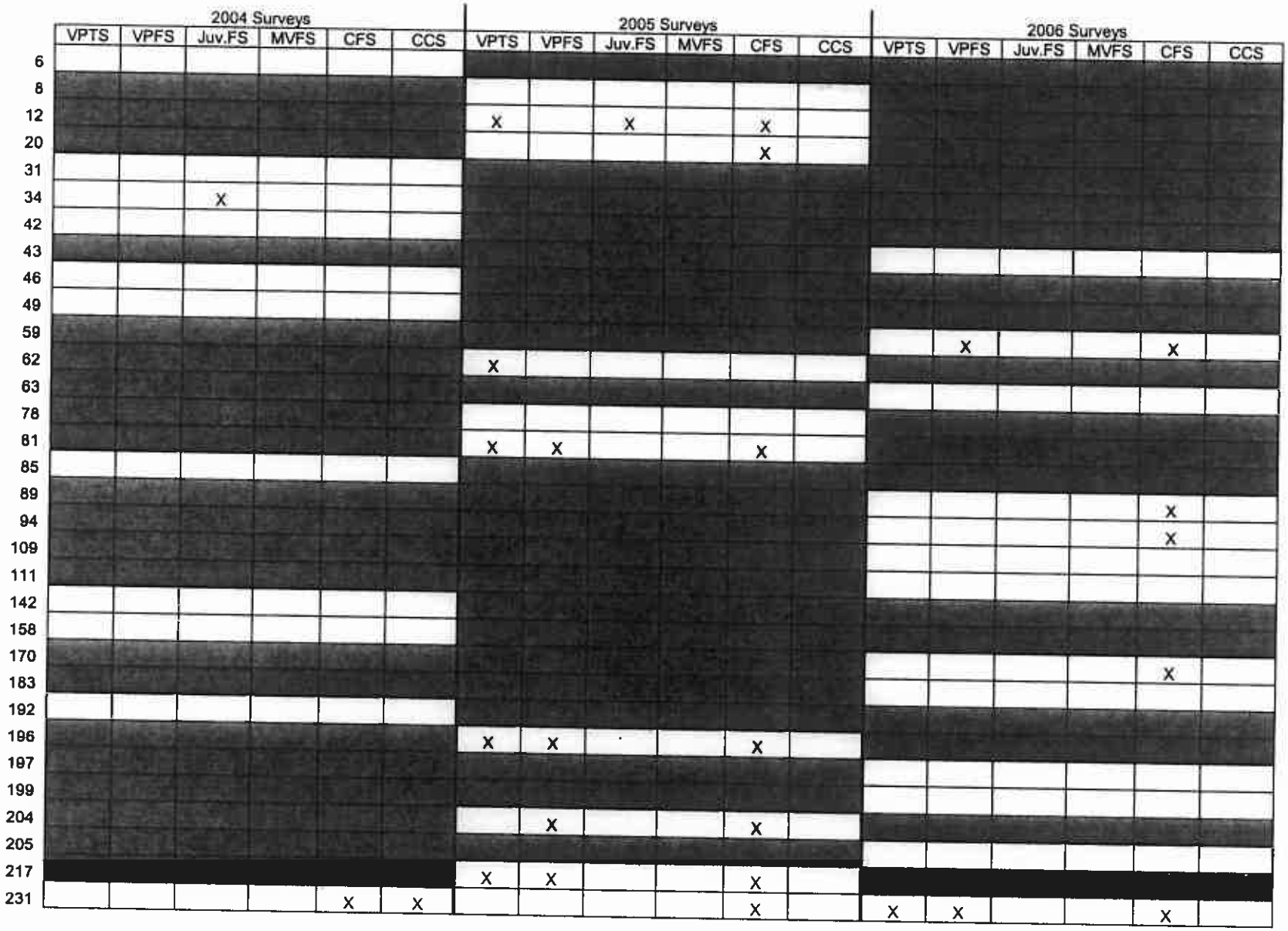
81 45x20 Pearl
Capes

6646 ½ Full
-15" diaphragm
nscub.

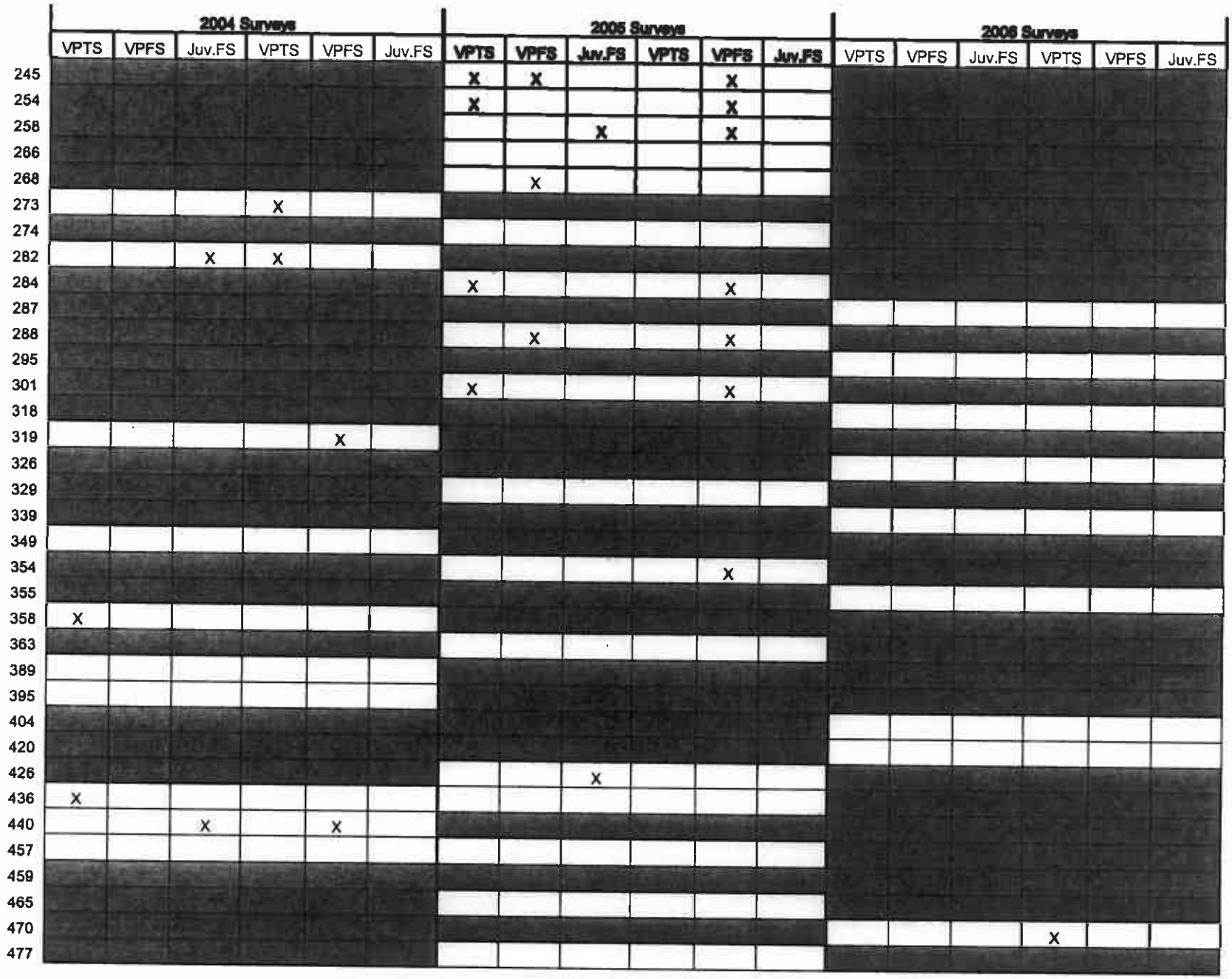
APENDIX B

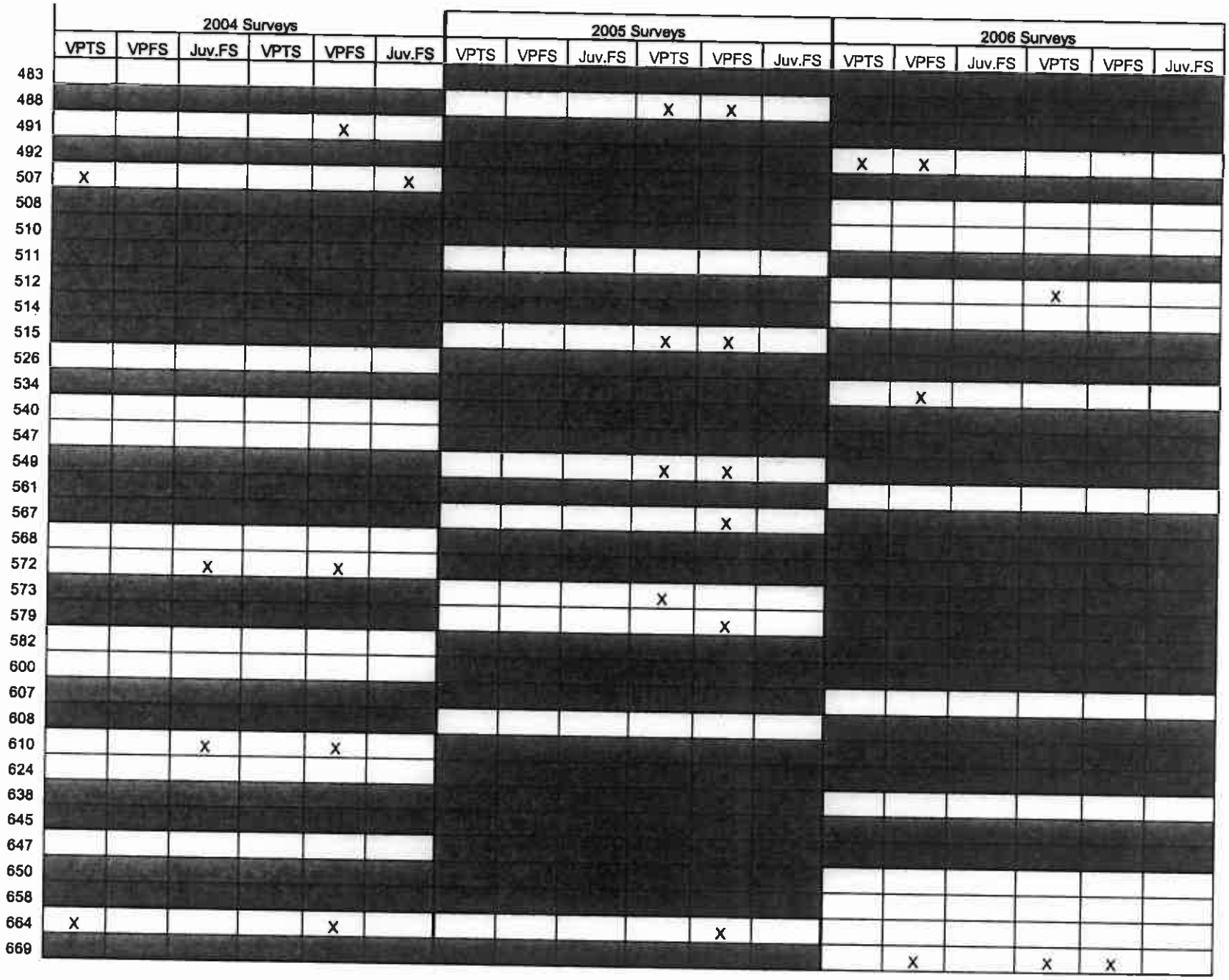
Historical Data

Table 2 – Previous captures of Large Branchiopods at Bryte Ranch Conservation Bank



	2004 Surveys						2005 Surveys						2006 Surveys					
	VPTS	VPFS	Juv.FS	MVFS	CFS	CCS	VPTS	VPFS	Juv.FS	MVFS	CFS	CCS	VPTS	VPFS	Juv.FS	MVFS	CFS	CCS
6																		
8																		
12							X		X		X							
20											X							
31																		
34			X															
42																		
43																		
46																		
49																		
59														X			X	
62							X											
63																		
78																		
81							X	X			X							
85																		
89																		
94																	X	
109																	X	
111																		
142																		
158																		
170																		
183																	X	
192																		
196							X	X			X							
197																		
199																		
204								X			X							
205																		
217							X	X			X							
231					X	X					X		X	X			X	


2004 Surveys
2005 Surveys
2006 Surveys
VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS
245 254 258 266 268 273 274 282 284 287 288 295 301 318 319 326 329 339 349 354 355 358 363 389 395 404 420 426 436 440 457 459 465 470 477


2004 Surveys
2005 Surveys
2006 Surveys
VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS
483
488
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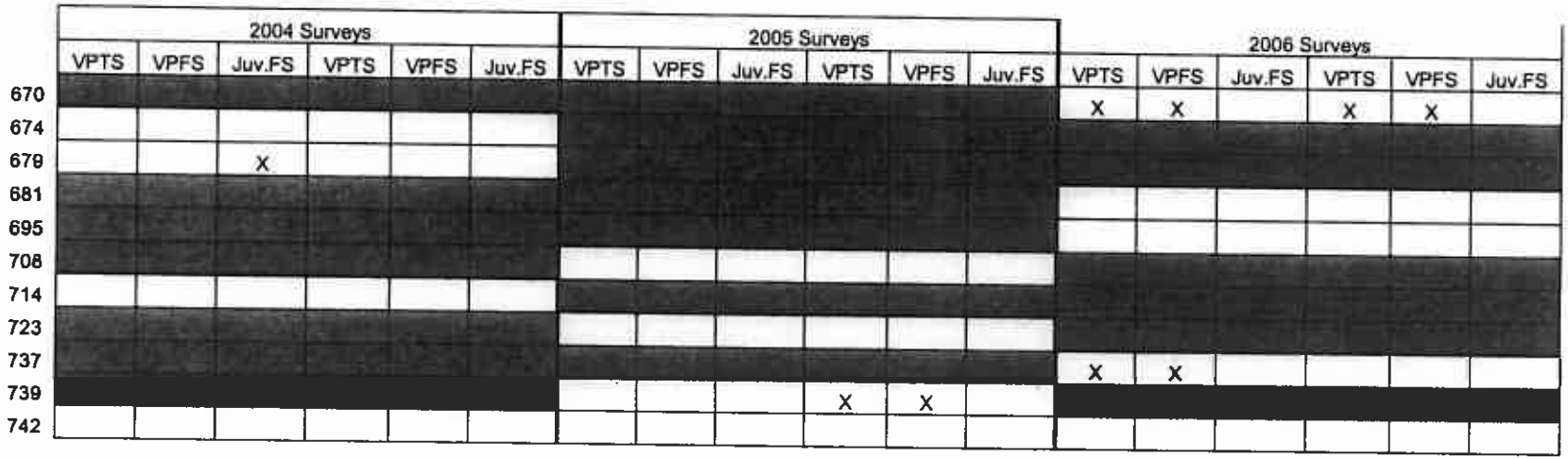
669


2004 Surveys
2005 Surveys
2006 Surveys
VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS VPTS VPFS Juv.FS
670
674
679
681
695
708
714
723
737
739
742
X
X
X
X
X
X
X
X
X