APPENDIX D

Biological Reports and
Wildlife Hazards Assessment

DRAFT

Aquatic Resources Delineation Report

The Farm at Alamo Creek

Solano County, California

October 2017

MADRONE ECOLOGICAL CONSULTING

Prepared for:
D.R. Stephens & Company
465 California St., Suite 330
San Francisco, California 94104

Recommended Citation:
Madrone Ecological Consulting, LLC (Madrone). 2017. *Draft Aquatic Resources Delineation Report for The Farm at Alamo Creek*. Prepared for D.R. Stephens & Company. Published on 26 October 2017.

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1.0 INTRODUCTION

This report presents the results of a delineation of aquatic resources within The Farm at Alamo Creek property and associated off-site areas (Project Area) conducted by Madrone Ecological Consulting, LLC (Madrone). The approximately 214-acre Project Area is located south of Hawkins Road, east of Leisure Town Road, and both north and south of Elmira Road in Solano County, California. The site is located within a portion of Section 19, Township 6 North, Range 1 East, and a portion of Section 24, Township 6 North, Range 1 West (MDB&M) of the "Elmira, California" 7.5·minute quadrangle (USGS 2015) (**Figure 1**). As shown in **Figure 1**, the Project Area is comprised of two Study Areas for the purposes of this document: Study Area 1 includes all of the Irrigation Canals that were constructed and are maintained by Solano Irrigation District (SID), and Study Area 2 covers the remainder of the Project Area. The Property Owner is seeking an Approved Jurisdictional Determination (AJD) for Study Area 1, and a Preliminary Jurisdictional Determination (PJD) for Study Area 2.

1.1 Contact Information

Property Owner

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Agent

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Sacramento, CA 95816

2.0 METHODOLOGY

Madrone senior biologist Daria Snider conducted a delineation of aquatic resources within the Project Area on 16 November 2016 and 6 July and 19 October 2017. Water features and data points were mapped in the field with a GPS unit capable of sub-meter accuracy (Trimble GeoXT and Arrow 100). Three-parameter data (vegetation, soils, and hydrology) were collected at each data point, documenting wetland/waters or upland status, as appropriate. The delineation maps were prepared in accordance with the *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (USACE 2016a). The GPS data was overlaid on an ortho-rectified aerial photograph (NAIP 2016).

The delineation was performed in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008a), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008b), and the Sacramento District's *Minimum Standards for Acceptance of Preliminary Wetlands Delineations* (USACE 2016b). U.S. Army Corps of Engineers (USACE) regulations (33 CFR 328) were used to determine the presence of Waters of the United States other than wetlands. The most recent *National Wetland Plant List* (Lichvar et al. 2016) was used to determine the wetland indicator status of plants observed in the Project Area. The *Jepson eFlora* (Jepson Flora Project 2017) was used for plant nomenclature, except where it

conflicted with the nomenclature in the *National Wetland Plant List*, which was given priority on the data sheets.

3.0 EXISTING CONDITIONS

The Project Area is largely comprised of agricultural fields and Old Alamo Creek, with its associated Valley oak (*Quercus lobata*) riparian corridor. The agricultural fields were planted primarily in alfalfa (*Medicago sativa*) during the field visits. A few irrigation canals that convey water to and from the agricultural fields run through the site. A narrow strip of regularly-mowed non-native annual grassland occurs along the southern edge of the Project Area, just north of Elmira Road. A small mesic area runs between Old Alamo Creek and what appears to be a stormdrain drop inlet within this annual grassland strip. A residential property is present in the southwestern corner of the Project Area; this area has a number of buildings, scattered large Valley oak trees, and ornamental vegetation, but is otherwise largely unvegetated. Ruderal vegetation occurs in small patches, scattered throughout the Project Area, mostly on field edges, adjacent to portions of the irrigation canal, or between the riparian corridor and roadways.

Surrounding lands to the north, east and south are similarly agricultural with scattered rural residences. Properties to the west are developed. The Project Area is very flat, and slopes very slightly from west to east. Elevations range from 94 feet above mean sea level in the southwestern corner to just under 80 feet along the eastern edge.

3.1 Terrestrial Vegetation Communities

3.1.1 Non-Native Annual Grassland

A narrow strip of non-native annual grassland occurs to the north of Elmira Road. This strip appears to be both the road right-of-way and a sewer or storm drain maintenance easement. As such, it was mowed during all of our field visits, and the dominant grasses were unidentifiable. However, it is assumed to be dominated common annual grassland species in the area, such as soft brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), perennial ryegrass (*Festuca perennis*), and wild oats (*Avena fatua*). Forbs observed intermittently in this area include yellow star-thistle (*Centaurea solstitialis*), prickly wild lettuce (*Lactuca serriola*), and wild radish (*Raphanus sativus*). A mesic inclusion in this strip is occupied by different plant species, including slender wheatgrass (*Elymus trachycaulus*), sorghum (*Sorghum halepense*), prickly sow-thistle (*Helminthotheca echioides*), Bermuda grass (*Cynodon dactylon*), alkali mallow (*Malvella leprosa*), curly dock (*Rumex crispus*), spring vetch (*Vicia sativa*), and chicory (*Cichorium intybus*).

3.1.2 Valley Oak Riparian Woodland

A well-developed Valley oak (*Quercus lobata*) riparian woodland occurs along both sides of Old Alamo Creek for most of its length through the Project Area. Within the Project Area, this community is relatively diverse. Dominant tree species include Valley oak, Fremont's cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), red willow (*S. laevigata*), English walnut (*Juglans regia*), and black walnut (*Juglans hindsii*).

Dominant shrubs in the understory include Himalayan blackberry (*Rubus armeniacus*), wild rose (*Rosa californica*), and sandbar willow (*Salix exigua*). Santa Barbara sedge (*Carex barbarae*) beds occupy large areas in the understory of this community, in between the Himalayan blackberry and the wild rose. The dense cover of these species leaves very little remaining space in the understory for other herbaceous vegetation. Other plant species observed relatively frequently in this community include cultivated almond (*Prunus dulcis*), olive (*Olea europaea*), blue elderberry (*Sambucus nigra* ssp. *cerulea*), tree of heaven (*Ailanthus altissima*), California bay laurel (*Umbellularia californica*), and eucalyptus (*Eucalyptus* species).

The portion of Old Alamo Creek south of Elmira Road supports a much more dense Valley oak riparian woodland. Although the large, overstory trees are consistent with the description above, the channel itself has been rendered virtually inaccessible due to an extremely tall, dense thicket of Himalayan blackberry, and in areas along the northern edge of the creek, a dense sandbar willow thicket.

3.1.3 Ruderal

Ruderal vegetation occurs in small patches throughout the Project Area. This community is comprised largely of non-native forbs, but some grasses are also present. Plant species commonly observed in this community within the Project Area include wild radish, velvet leaf (*Abutilon theophrasti*), tomatillo (*Physalis philadelphica*), lambs quarters (*Chenopodium album*), bull mallow (*Malva nicaeensis*), prickly sow thistle, sorghum, wild oats, winter vetch (*Vicia villosa*), jungle rice (*Echinochloa colona*), chickweed (*Stellaria media*), henbit (*Lamium amplexicaule*), alkali mallow, sweet fennel (*Foeniculum vulgare*), and poison hemlock (*Conium maculatum*).

3.2 Hydrology

3.2.1 Study Area 1

The Irrigation Canals that run through Study Area 1 convey water from SID's Putah South Canal to agricultural fields both on-site and off-site. These features appear to have been constructed in uplands (see discussion in **Section 4.5**), and do not convey any natural stormwater or groundwater flow. The agricultural fields within Study Area 1 are irrigated with water from the Irrigation Canals, and these fields drain through a series of off-site ditches to Ulatis Creek. Study Area 1 is located in both the *Alamo Creek Watershed* (HUC 180201630504) and the *Lower Ulatis Creek Watershed* (HUC 180201630505) (USGS 1978).

3.2.2 Study Area 2

The agricultural fields to the north of Old Alamo Creek are irrigated with water from the Irrigation Canals, and these fields and the roadside ditches drain through a series of off-site ditches to Ulatis Creek. The agricultural field to the south of Old Alamo Creek is irrigated with piped SID water. Surface water runoff in all areas south of Old Alamo Creek drain to Old Alamo Creek. Old Alamo Creek is a tributary to Ulatis Creek, which is a tributary of the Sacramento River. Study Area 2 is also located in both the *Alamo Creek Watershed* (HUC 180201630504) and the *Lower Ulatis Creek Watershed* (HUC 180201630505) (USGS 1978).

3.3 Soils

The Natural Resources Conservation Service has mapped five soil units within the Project Area (**Figure 2**); (BrA) Brentwood clay loam, 0 to 2% slopes; (Ca) Capay silty clay loam; (RoA) Rincon clay loam, 0 to 2% slopes; (Yo) Yolo loam; and (Yr) Yolo loam, clay substratum (NRCS 2017). None of these soils consist of hydric components or have hydric inclusions (NRCS 2017).

3.4 Driving Directions

To access the Project Area from Sacramento, drive west on Interstate 80 to the Leisure Town Road exit. Head south on Leisure Town Road to its intersection with Hawkins Road. The Project Area is on your left, just south of Hawkins Road.

4.0 RESULTS

A total of 6.696 acres of aquatic resources were delineated within the Project Area (**Table 1**). Of this total, 2.426 acres of aquatic resources were delineated within Study Area 1, for which the property owner is seeking an AJD, and 4.270 acres were delineated within Study Area 2, for which the property owner is seeking a PJD.

Data sheets are included in **Attachment A**, maps of the aquatic resources are included as **Figure 3** and **Attachments B and C**, and a list of the plant species observed in the Study Area with their wetland indicator status is included in **Attachment D**. GIS Shapefiles and the *Aquatic Resources Excel Spreadsheet* for the aquatic resources shown on **Figure 3** are included on a CD in **Attachment E**. Each of the feature types is described below.

Table 1. Aquatic Resources Mapped within the Project Area

Resource Type	Acreage
Study Area 1	
Irrigation Canal	2.426
Total	**2.426**
Study Area 2	
Old Alamo Creek	3.992
Irrigation Ditch	0.154
Roadside Ditch	0.124
Total	**4.270**

4.1 Study Area 1

4.1.1 Irrigation Canal

The Irrigation Canals that run through Study Area 1 convey water from SID's Putah South Canal to agricultural fields both on-site and off-site. Portions of these canals are concrete-lined, while other portions

are well-maintained dirt-lined canals. As such, there is little to no vegetation within or on the banks of these features. The OHWM of the Irrigation Canals was identified in the field based on the extent of water marks, and (where applicable) the edge of sparse adjacent vegetation.

4.1.2 Historical Aerial and Topographic Map Review

A variety of historical aerial photographs dating back to 1968 and topographic maps dating back to 1908 (Historic Aerials 2017) were reviewed to determine whether the irrigation canals mapped within Study Area 1 were natural, or if they were created in uplands. Based on the topographic map review, the only aquatic resource within the Study Area through 1965 was Alamo Creek, which ran through what are now alfalfa fields. No ditches, canals, or wetlands were visible in the 1965 or prior topographic maps. Sometime between 1965 and 1968 (the earliest available historical aerial photograph), Alamo Creek was realigned into its current channel, and the Putah South Canal was constructed (off-site), along with the Irrigation Canals within the Study Area, which convey irrigation water from the Putah South Canal. In summary, it appears that all of the irrigation canals within Study Area 1 were constructed in uplands, and as such, would not be subject to USACE jurisdiction.

4.2 Study Area 2

4.2.1 Old Alamo Creek

Old Alamo Creek is an intermittent drainage that runs through the southern portion of Study Area 2, and is bordered on both sides by a well-developed Valley oak woodland. In the central portion of Study Area 2, this feature is bordered only by herbaceous vegetation, and in the eastern portion of the Study Area, the channel of the creek is almost entirely obscured by Himalayan blackberry. Although some deeper portions of the creek appear to pond water perennially in stagnant pools, much of the creek through Study Area 2 dries out during the summer, likely due to the historic diversion of a portion of Alamo Creek's flow into a channel ("New Alamo Creek") that runs south of the Project Area. The creek is quite broad through the woodland areas, ranging from 20-30 feet or more in width. In the eastern reach, it narrows down to just 10 feet wide. The Ordinary High Water Mark (OHWM) of Old Alamo Creek was identified in the field based on the extent of adjacent vegetation, shelving, and water marks.

4.2.2 Irrigation Ditch

Irrigation Ditches in the southern portion of Study Area 2 appears to drain irrigation water from the southern agricultural fields into Old Alamo Creek. These features are much smaller than the irrigation canals in Study Area 1, and although they are unvegetated within the channel, the banks are densely vegetated with facultative species such as curly dock, sorghum, and prickly cocklebur. The OHWM of the Irrigation Ditches were identified in the field based on the extent of water marks, and the edge of adjacent vegetation.

4.2.3 Roadside Ditch

A roadside ditch is present along the northern border of Study Area 2, just south of Hawkins Road. The roadside ditch collects runoff from Hawkins Road, and conveys it east through a series of off-site ditches into Ulatis Creek. This feature is primarily unvegetated due to ditch maintenance, but some ruderal vegetation has become established in portions. Plant species observed in and adjacent to this feature include pigweed amaranth (*Amaranthus albus*), wild radish, tall nutsedge, dallisgrass, and wild carrot (*Daucus carota*). The OHWM of the roadside ditch was identified in the field based on the extent of scour, shelving, and changes in vegetation.

4.2.4 Historical Aerial and Topographic Map Review

A variety of historical aerial photographs dating back to 1968 and topographic maps dating back to 1908 (Historic Aerials 2017) were reviewed to determine whether the ditches mapped within Study Area 2 were natural, or if they were created in uplands. Based on the topographic map review, the only aquatic resource within Study Area 2 through 1965 was Alamo Creek. No ditches or canals were visible in the 1965 or prior topographic maps. It appears that the irrigation ditch south of Alamo Creek was created between 1965 and 1968. Due to the poor resolution of the early photographs, it is difficult to determine when the roadside ditch was constructed, but it is assumed that the ditch was constructed when Hawkins Road was paved. The ditch is visible in the 2003 aerial photograph.

In summary, it appears that all of irrigation ditches and roadside ditches within Study Area 2 were constructed in uplands. As the 300 linear foot limit for filling and excavating stream beds under a Nationwide Permit does not apply to ditches constructed in uplands (72 FR 11097), it is our assertion that these features, while potentially jurisdictional, would not be subject to this 300 foot limit.

5.0 CONCLUSION

The applicant is requesting an Approved Jurisdictional Determination for the Aquatic Resources Delineation map of Study Area 1 included as **Attachment B** and a Preliminary Jurisdictional Determination for the Aquatic Resources Delineation map of Study Area 2 included as **Attachment C**. A signed statement providing USACE staff accompanied access to the Project Area (which encompasses both Study Areas) is included as **Attachment F**.

6.0 REFERENCES

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station. Vicksburg, Miss.

Historic Aerials. 2017. *Aerial photographs and topographic maps of the Project Area from 1908 through 2012.* Accessed on-line at: https://www.historicaerials.com/viewer in August 2017.

Jepson Flora Project (eds.) 2017. *Jepson eFlora*. Available on-line at: http://ucjeps.berkeley.edu/eflora/ [accessed August 2017]

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List: 2016 Wetland Ratings*. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

National Agricultural Imagery Program (NAIP). 2016. *Aerial Photograph of the Project Area*. Dated 30 May 2016.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (NRCS). 2017. *Web Soil Survey*. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed August 2017.

U.S. Army Corps of Engineers (USACE). 2016. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports*. U.S. Army Corps of Engineers, Sacramento District. Dated January 2016. Available online at: http://www.spk.usace.army.mil/Portals/12/documents/regulatory/jd/minimum-standards/Minimum_Standards_for_Delineation_with_Template-final.pdf

U.S. Army Corps of Engineers (USACE). 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

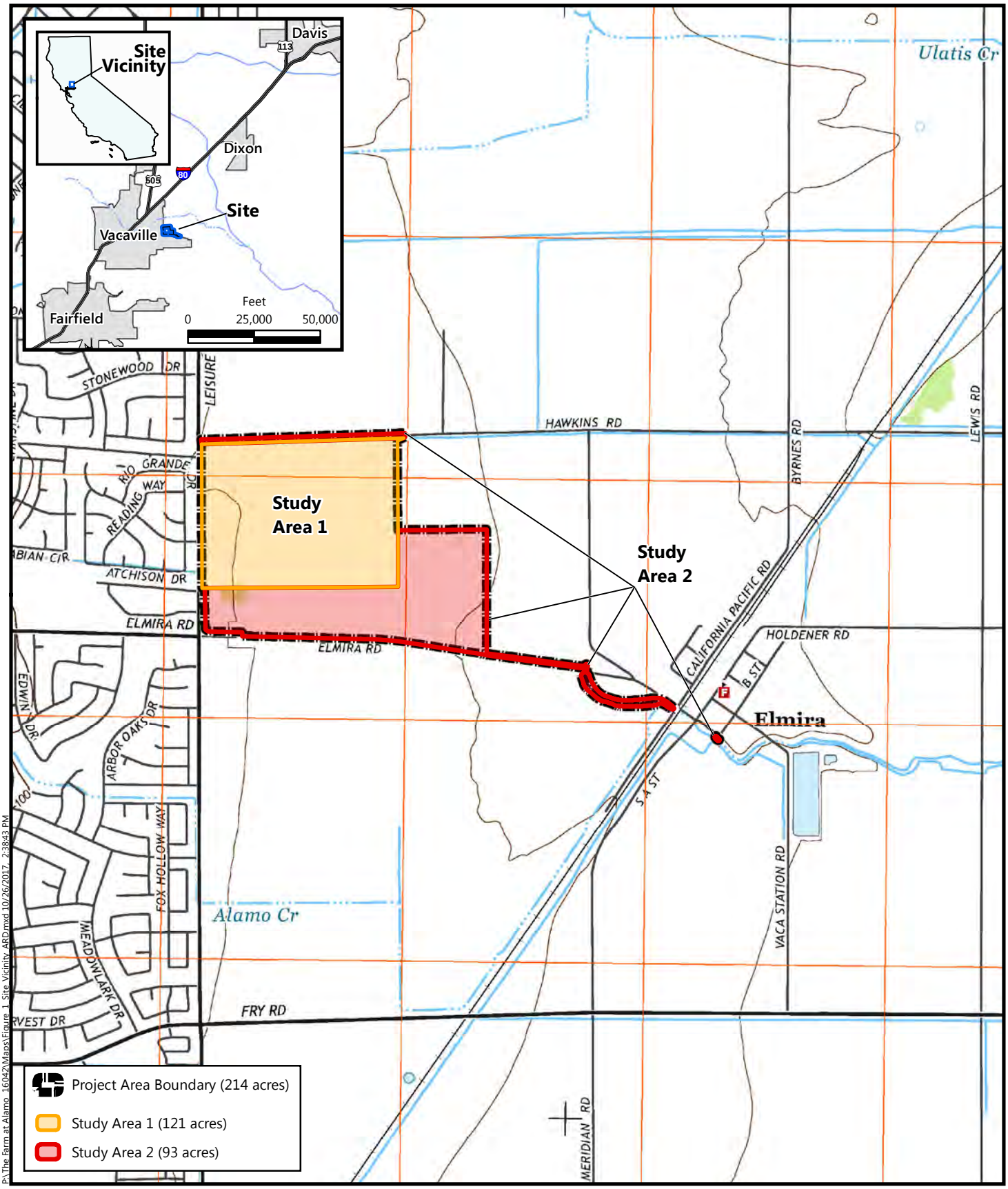
U.S. Army Corps of Engineers (USACE). 2008b. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. A Delineation Manual*. Prepared by R. W. Lichvar and S. M. McColley. ERDC/CRREL TR-08-12. Cold Regions Research and Engineering Laboratory.

U.S. Army Corps of Engineers (USACE). 2016a. *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program*. Dated February 10, 2016. Available online at: http://www.spd.usace.army.mil/Missions/Regulatory/Public-Notices-and-References/Article/651327/updated-map-and-drawing-standards/

U.S. Department of the Interior, Geological Survey (USGS). 1978. *Hydrologic Unit Map, State of California*. Geological Survey. Reston, Virginia.

U.S. Department of the Interior, Geological Survey (USGS). 2015. *Elmira, California* 7.5-minute Quadrangle. Geological Survey. Denver, Colorado.

Figures



P:\The Farm at Alamo_16042\Maps\Figure 1_Site_Vicinity_ARD.mxd 10/26/2017, 2:38:43 PM

Source: United States Geologic Survey, 2015.
"Elmira, California" 7.5-Minute Topographic Quadrangle
Section 19, Township 6 North, Range 1 East, MDB&M
Section 24, Township 6 North, Range 1 West, MDB&M
Longitude -121.924576, Latitude 38.353867

Figure 1
Site Vicinity

The Farm at Alamo Creek
Solano County, California

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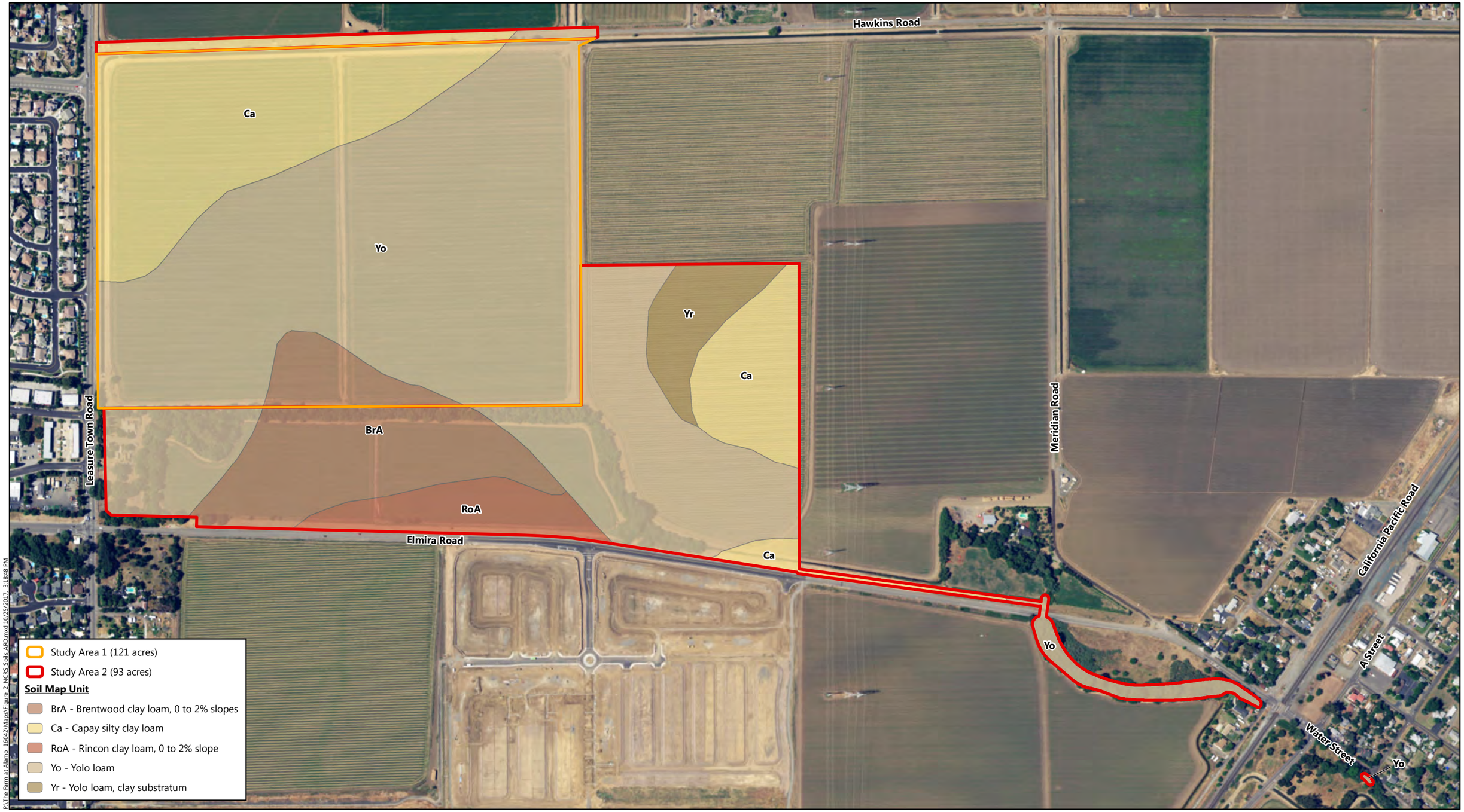

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Soil Survey Source: *USDA, Soil Conservation Service. Soil Survey Geographic (SSURGO) database for Sonoma County, California*
Aerial Source: *USDA, National Agriculture Imagery Program,* 30 May 2016

Figure 2
Natural Resources Conservation Service Soils

The Farm At Alamo Creek
Solano County, California

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Figure 3
Aquatic Resources

The Farm At Alamo Creek
Solano County, California

Aerial Source: *USDA, National Agriculture Imagery Program,* 30 May 2016

Attachments

Attachment A. Arid West Wetland Determination Data Forms

Attachment B. Aquatic Resources Delineation – Study Area 1

Attachment C. Aquatic Resources Delineation - Study Area 2

Attachment D. Plant Species Observed within the Project Area

Attachment E. GIS Shapefiles and the Aquatic Resources Excel Spreadsheet (on CD)

Attachment F. Access Letter

Attachment A

Arid West Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 08/17/17

Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 1

Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West

Landform (hillslope, terrace, etc.): Constructed Channel Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): Mediterranean California (LRR C) Lat: 38.358566 Long: -121.933691 Datum: NAD 83

Soil Map Unit Name: Ca - Capay silty clay loam NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Waters?** Yes X No _____
Hydric Soil Present?	Yes _____	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Data point is located in a roadside ditch.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	0 =Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ =Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	**0**
FACW species	x2 =	**0**
FAC species	x3 =	**0**
FACU species	x4 =	**0**
UPL species	x5 =	**0**
Column Totals:	(A)	**0** (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

_____ Dominance Test is >50%

_____ Prevalence Index is ≤3.0[1]

_____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

Ditch channel is unvegetated. Adjacent vegetation is ruderal: *Amaranthus albus, Daucus carota, Bromus diandrus, Hirschfeldia incana,* etc.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

No soils data taken as this is a waters point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

OHWM present and indicated by extent of adjacent vegetation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 08/17/17
Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 2
Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West
Landform (hillslope, terrace, etc.): Roadway Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) Lat: 38.358551 Long: -121.933691 Datum: NAD 83
Soil Map Unit Name: Ca - Capay silty clay loam NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Upland comparison to DP 10.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		
% Bare Ground in Herb Stratum 100	% Cover of Biotic Crust 0		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)
Total Number of Dominant Species Across All Strata: ____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	**0**
FACW species	x2 =	**0**
FAC species	x3 =	**0**
FACU species	x4 =	**0**
UPL species	x5 =	**0**
Column Totals: ____ (A)		**0** (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks:

Unvegetated. Data point is located in a well-maintained dirt farm road.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					silty clay loam	refusal at 3" due to compaction

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydric soil indicators detected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators detected.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 11/16/16
Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 3
Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) Lat: 38.351144 Long: -121.924073 Datum: NAD 83
Soil Map Unit Name: RoA - Rincon clay loam, 0 to 2% slope NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

Location suspect due to concave area, aerial signature, and shift in vegetation. However, the area is not dominated by hydrophytic vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0	=Total Cover	
Herb Stratum (Plot size: ____)			
1. *Elymus trachycaulus*	40	X	FACU
2. *Sorghum halapense*	20	X	FACU
3. *Rumex crispus*	Trace		FAC
4. *Cynodon dactylon*	Trace		FACU
5.			
6.			
7.			
8.			
	60	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **2** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	**0**
FACW species	x2 =	**0**
FAC species	x3 =	**0**
FACU species **60**	x4 =	**240**
UPL species	x5 =	**0**
Column Totals: **60** (A)		**240** (B)

Prevalence Index = B/A = **4.0**

Hydrophytic Vegetation Indicators:
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 4/1	95	7.5YR 4/4	5	C	PL, M	clay	
4-8	7.5YR 2.5/1	50	7.5YR 4/4	50	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 11/16/16
Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 4
Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) Lat: 38.351188 Long: -121.924075 Datum: NAD 83
Soil Map Unit Name: Yo - Yolo loam NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Comparison to suspect DP 3 and DP 5.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	0	=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0	=Total Cover	
Herb Stratum (Plot size: ____)			
1. *Bromus diandrus*	95	X	UPL
2. *Brassica nigra*	5		UPL
3. *Cichorium intybus*	trace		FACU
4. *Vicia sativa*	trace		FACU
5.			
6.			
7.			
8.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	
% Bare Ground in Herb Stratum 0	% Cover of Biotic Crust 0		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **1** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	____ x1 =	**0**
FACW species	____ x2 =	**0**
FAC species	____ x3 =	**0**
FACU species	____ x4 =	**0**
UPL species	**100** x5 =	**500**
Column Totals:	**100** (A)	**500** (B)

Prevalence Index = B/A = **5.0**

Hydrophytic Vegetation Indicators:
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR3/2	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators detected.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 11/16/16

Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 5

Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West

Landform (hillslope, terrace, etc.): Constructed Channel Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): Mediterranean California (LRR C) Lat: 38.351254 Long: -121.924099 Datum: NAD 83

Soil Map Unit Name: Yo - Yolo loam NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Waters?** Yes X No ____
Hydric Soil Present?	Yes ____	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Data point is located in an irrigation ditch.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	0 =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	**0**
FACW species	x2 =	**0**
FAC species	x3 =	**0**
FACU species	x4 =	**0**
UPL species	x5 =	**0**
Column Totals:	(A)	**0** (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0[1]

____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

The irrigation ditch channel is unvegetated, but adjacent vegetation includes *Sorghum halapense* , *Rumex crispus* , and *Paspalum dilatatum* .

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

No soils data taken as this is a waters point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

OHWM present and indicated by water marks and edge of adjacent vegetation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 08/17/17

Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 6

Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): Mediterranean California (LRR C) Lat: 38.351018 Long: -121.92202 Datum: NAD 83

Soil Map Unit Name: Yo - Yolo loam NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Waters?** Yes X No ____
Hydric Soil Present?	Yes ____	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Data point is located in Alamo Creek.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	0 =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	=Total Cover		
% Bare Ground in Herb Stratum ____	% Cover of Biotic Crust 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	**0**
FACW species	x2 =	**0**
FAC species	x3 =	**0**
FACU species	x4 =	**0**
UPL species	x5 =	**0**
Column Totals:	(A)	**0** (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0[1]

____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

Channel is unvegetated, but adjacent vegetation includes *Cyperus eragrostis, Rumex crispus, Leptochloa fascicularis, Echinochloa colona, Xanthium strumarium, Polypogon monspeliensis,* and *Helminthotheca echioides.*

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ___

Remarks:

No soils data taken as this is a waters point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 8

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

OHWM present and indicated by extent of adjacent vegetation, shelving, and water marks.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 08/17/17
Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 7
Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West
Landform (hillslope, terrace, etc.): Roadway Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) Lat: 38.35106 Long: -121.922008 Datum: NAD 83
Soil Map Unit Name: Yo - Yolo loam NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Upland comparison to DP 6.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)
Total Number of Dominant Species Across All Strata: ____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **#DIV/0!** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	**0**
FACW species	x2 =	**0**
FAC species	x3 =	**0**
FACU species	x4 =	**0**
UPL species	x5 =	**0**
Column Totals: **0** (A)		**0** (B)

Prevalence Index = B/A = **#DIV/0!**

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is ≤3.0[1]
____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **0**

Remarks:

Unvegetated. Data point is located in a well-maintained dirt farm road.

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					clay loam	refusal at 4" due to compaction

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydric soil indicators detected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators detected.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek | City/County: Solano County | Sampling Date: 11/16/16
Applicant/Owner: D.R. Stephens and Company | State: CA | Sampling Point: 8
Investigator(s): Daria Snider | Section, Township, Range: Section 24, Township 6 North, Range 1 West
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): None | Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) | Lat: 38.352488 | Long: -121.923589 | Datum: NAD 83
Soil Map Unit Name: Yo - Yolo loam | NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Location suspect due to aerial signature. None of the three wetland criteria are satisfied in this location.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	0	=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0	=Total Cover	
Herb Stratum (Plot size: ____)			
1. *Medicago sativa*	75	X	UPL
2. *Unknown grass*	5		--
3.			
4.			
5.			
6.			
7.			
8.			
	80	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	
% Bare Ground in Herb Stratum 25	% Cover of Biotic Crust 0		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **1** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	**0**
FACW species		x2 =	**0**
FAC species		x3 =	**0**
FACU species		x4 =	**0**
UPL species	**75**	x5 =	**375**
Column Totals:	**75** (A)		**375** (B)

Prevalence Index = B/A = **5.0**

Hydrophytic Vegetation Indicators:
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR3/2	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydric soil indicators detected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators detected.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek | City/County: Solano County | Sampling Date: 08/17/17
Applicant/Owner: D.R. Stephens and Company | State: CA | Sampling Point: 9
Investigator(s): Daria Snider | Section, Township, Range: Section 24, Township 6 North, Range 1 West
Landform (hillslope, terrace, etc.): Constructed channel | Local relief (concave, convex, none): None | Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) | Lat: 38.35388 | Long: -121.933775 | Datum: NAD 83
Soil Map Unit Name: Yo - Yolo loam | NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Waters?** Yes **X** No ____
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

Data point is located in a concrete-lined irrigation canal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 =Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		
% Bare Ground in Herb Stratum 100	% Cover of Biotic Crust 0		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)
Total Number of Dominant Species Across All Strata: ____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **#DIV/0!** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	____ x1 =	**0**
FACW species	____ x2 =	**0**
FAC species	____ x3 =	**0**
FACU species	____ x4 =	**0**
UPL species	____ x5 =	**0**
Column Totals:	**0** (A)	**0** (B)

Prevalence Index = B/A = **#DIV/0!**

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is ≤3.0[1]
____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks:

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Channel is concrete-lined. No soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 24+

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

OHWM present and indicated by water marks on the side of the canal.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 08/17/17
Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 10
Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West
Landform (hillslope, terrace, etc.): Roadway Local relief (concave, convex, none): None Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) Lat: 38.353873 Long: -121.933706 Datum: NAD 83
Soil Map Unit Name: Yo - Yolo loam NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

Upland comparison to DP 8.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	=Total Cover	

Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0	=Total Cover	

Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0	=Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)
Total Number of Dominant Species Across All Strata: ____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	**0**
FACW species	x2 =	**0**
FAC species	x3 =	**0**
FACU species	x4 =	**0**
UPL species	x5 =	**0**
Column Totals: ____ (A)		**0** (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks:

Unvegetated. Data point is located in a well-maintained dirt farm road.

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					clay loam	refusal at 3" due to compaction

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydric soil indicators detected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators detected.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: The Farm at Alamo Creek City/County: Solano County Sampling Date: 11/16/16

Applicant/Owner: D.R. Stephens and Company State: CA Sampling Point: 11

Investigator(s): Daria Snider Section, Township, Range: Section 24, Township 6 North, Range 1 West

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): Mediterranean California (LRR C) Lat: 38.355387 Long: -121.929305 Datum: NAD 83

Soil Map Unit Name: Yo - Yolo loam NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No **X**	**Is the Sampled Area within a Wetland?** Yes _____ No **X**
Hydric Soil Present?	Yes _____	No **X**	
Wetland Hydrology Present?	Yes _____	No **X**	

Remarks:

Location suspect due to aerial signature. None of the three wetland criteria are satisfied in this location.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	0	=Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0	=Total Cover	
Herb Stratum (Plot size: _____)			
1. *Medicago sativa*	100	X	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	=Total Cover	

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	_____ x1 =	**0**
FACW species	_____ x2 =	**0**
FAC species	_____ x3 =	**0**
FACU species	_____ x4 =	**0**
UPL species	**100** x5 =	**500**
Column Totals:	**100** (A)	**500** (B)

Prevalence Index = B/A = **5.0**

Hydrophytic Vegetation Indicators:

_____ Dominance Test is >50%

_____ Prevalence Index is ≤3.0[1]

_____ Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No **X**

Remarks:

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR3/2	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

No hydric soil indicators detected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators detected.

Attachment B

Aquatic Resources Delineation

Study Area 1

AQUATIC RESOURCE FEATURES		
Irrigation Canal		
Feature ID	**Acreage**	**Linear Feet**
IC 1	1.882	4,311
IC 2	0.020	52
IC 3	0.525	1,904
Total:	**2.426**	**6,267**
Aquatic Resources Total:		**2.426 acres**

Project Name: The Farm at Alamo Creek
Map Title: Aquatic Resources Delineation, Study Area 1
Path: P:\The Farm at Alamo 16042\Maps\Attachment_ARD_2017_AJD.mxd
Date Map Prepared: 26 October 2017

Notes:
Scale: 1 inch = 200 feet
Coordinate System: NAD 1983 State Plane California II
Datum: NAD83
Projection: Transverse Mercator
Vertical Data: NAVD88
Aerial Base: USDA, National Agriculture Imagery Program
Aerial Base Flown: 30 May 2016
Date Map Prepared: 26 October 2017
Map Prepared by: N. Bente
Delineation Performed by: D. Snider
Definitions:
ac = acre
NAD = North American Datum
NAVD = North American Vertical Datum
USDA = United States Department of Agriculture

N
0 100 200 400
Feet

Prepared For:

D.R. Stephens & Company
465 California Street
Suite 330
San Francisco, California 94104

Study Area 1 (121 acres)
Reference Point (decimal degrees, NAD83)
Data Point

Aquatic Resources
Irrigation Canal (2.426 acres)

Aquatic Resources Delineation
The Farm At Alamo Creek
Study Area 1
Solano County, California

MADRONE ECOLOGICAL CONSULTING
8421 Auburn Boulevard, Suite 248
Citrus Heights, California 95610
(916) 822.3220 | www.madroneeco.com

Attachment C

Aquatic Resources Delineation

Study Area 2

AQUATIC RESOURCE FEATURES

Irrigation Ditch

Feature ID	Acreage	Linear Feet
ID 1	0.143	1,456
ID 2	0.006	74
ID 3	0.004	29
	0.154	**1,559**

Old Alamo Creek

Feature ID	Acreage	Linear Feet
Creek 1	2.161	3,294
Creek 2	0.792	165
Creek 3	0.025	94
Creek 4	0.021	40
Creek 5	0.006	7
Creek 6	0.972	1,435
Creek 7	0.008	27
Creek 8	0.007	28
	3.992	**5,090**

Roadside Ditch

Feature ID	Acreage	Linear Feet
RD 1	0.001	29
RD 2	0.117	2,551
RD 3	0.006	120
	0.124	**2,700**
Total:	**4.270**	**9,349**

Aquatic Resources Total: 4.270 acres

Project Name: The Farm at Alamo Creek
Map Title: Aquatic Resources Delineation, Study Area 2
Path: P:\The Farm at Alamo 16042\Maps\Attachment_ARD_2017_PJD.mxd
Date Map Prepared: 26 October 2017

Notes:
Inset A and Inset B Scale: 1 inch = 200 feet
Inset C Scale: 1 inch = 100 feet
Coordinate System: NAD 1983 State Plane California II
Datum: NAD83
Projection: Transverse Mercator
Vertical Data: NAVD88
Aerial Base: USDA, National Agriculture Imagery Program
Aerial Base Flown: 30 May 2016
Date Map Prepared: 26 October 2017
Map Prepared by: N. Bente
Delineation Performed by: D. Snider
Definitions:
ac = acre
NAD = North American Datum
NAVD = North American Vertical Datum
USDA = United States Department of Agriculture

N
0 100 200 400
Feet

Prepared For:

D.R. Stephens & Company
465 California Street
Suite 330
San Francisco, California 94104

Study Area 2 (93 acres)
Reference Point (decimal degrees, NAD83)
Data Point
Culvert
Ground Surface Elevation, 1 foot contour

Aquatic Resources (4.270 acres)
Irrigation Ditch (0.154 acre)
Old Alamo Creek (3.992 acres)
Roadside Ditch (0.124 acre)

Aquatic Resources Delineation
The Farm At Alamo Creek
Study Area 2
Solano County, California

MADRONE ECOLOGICAL CONSULTING
8421 Auburn Boulevard, Suite 248
Citrus Heights, California 95610
(916) 822.3220 | www.madroneeco.com

Attachment D

Plant Species Observed within the Project Area

Plant Species Observed within
The Farm at Alamo Creek Project Area
16 November 2016, 17 August 2017, and 19 October 2017

Species Name	Common Name	Wetland Indicator Status
Abutilon theophrasti	Velvet-leaf	UPL
Ailanthus altissima	Tree of heaven	FACU
Amaranthus albus	Tumbleweed	FACU
Amaranthus blitoides	Procumbent pigweed	FACU
Artemisia douglasiana	Mugwort	FAC
Arundo donax	Giant reed	FACW
Asclepias fascicularis	Narrow-leaf milkweed	FAC
Avena fatua	Wild oat	UPL
Bidens frondosa	Sticktight	FACW
Brassica nigra	Black mustard	UPL
Brassica rapa	Field mustard	FACU
Bromus diandrus	Ripgut grass	UPL
Bromus hordeaceus	Soft chess	FACU
Carduus pycnocephalus subsp. *pycnocephalus*	Italian thistle	UPL
Carex barbarae	Santa Barbara sedge	FAC
Chenopodium album	Lamb's quarters	FACU
Cichorium intybus	Chicory	FACU
Cirsium vulgare	Bull thistle	FACU
Conium maculatum	Poison hemlock	FACW
Convolvulus arvensis	Bindweed	UPL
Cynodon dactylon	Bermuda grass	FACU
Cyperus eragrostis	Tall nutsedge	FACW
Echinochloa colona	Jungle rice	FAC
Elymus trachycaulus subsp. *trachycaulus*	Slender wheat grass	FACU
Epilobium brachycarpum	Panicled willow-herb	UPL
Erigeron canadensis	Horseweed	FACU
Erodium cicutarium	Redstem filaree	UPL
Eucalyptus camaldulensis	Red gum, river red gum	FAC
Festuca perennis	Rye grass	FAC
Ficus carica	Edible fig	FACU
Foeniculum vulgare	Fennel	UPL
Galium aparine	Goose grass	FACU
Geranium dissectum	Cut leaf geranium	UPL
Helminthotheca echioides	Bristly ox-tongue	FAC
Hirschfeldia incana	Tumble mustard	UPL
Juglans hindsii x *regia*	Hybrid walnut	FAC
Juglans regia	English walnut	UPL

Species Name	Common Name	Wetland Indicator Status
Lactuca serriola	Prickly lettuce	FACU
Lamium amplexicaule	Henbit	UPL
Leptochloa fusca subsp. *fascicularis*	Bearded sprangletop	FACW
Leymus triticoides	Creeping wild rye	FAC
Malva nicaeensis	Bull mallow	UPL
Malvella leprosa	Alkali-mallow	FACU
Medicago sativa	Alfalfa	UPL
Olea europaea	Cultivated olive	UPL
Opuntia ficus-indica	Mission prickly-pear	UPL
Panicum capillare	Witch grass	FACU
Paspalum dilatatum	Dallis grass	FAC
Persicaria maculosa	Lady's thumb	FACW
Phalaris paradoxa	Hood canary grass	FAC
Phoenix canariensis	Canary island palm	UPL
Physalis philadelphica	Tomatillo	UPL
Plantago lanceolata	English plantain	FAC
Polygonum aviculare subsp. *depressum*	Prostrate knotweed	FAC
Polypogon monspeliensis	Annual rabbitfoot grass	FACW
Populus fremontii subsp. *fremontii*	Fremont cottonwood	FAC
Portulaca oleracea	Purslane	FAC
Prunus dulcis	Almond	UPL
Quercus chrysolepis	Canyon live oak	UPL
Quercus lobata	Valley oak	FACU
Raphanus sativus	Radish	UPL
Rosa californica	California rose	FAC
Rubus armeniacus	Himalayan blackberry	FAC
Rumex crispus	Curly dock	FAC
Salix exigua var. *exigua*	Sandbar willow	FACW
Salix gooddingii	Goodding's black willow	FACW
Salix laevigata	Red willow	FACW
Salix lasiolepis	Arroyo willow	FACW
Sambucus nigra subsp. *caerulea*	Blue elderberry	FACU
Silybum marianum	Milk thistle	UPL
Solanum americanum	White nightshade	FACU
Sorghum halepense	Johnson grass	FACU
Stellaria media	Common chickweed	FACU
Stipa miliacea var. *miliacea*	Smilo grass	UPL
Toxicodendron diversilobum	Western poison oak	FACU
Tragopogon porrifolius	Salsify	UPL
Tribulus terrestris	Puncture vine	UPL
Umbellularia californica	California bay	FAC

Species Name	Common Name	Wetland Indicator Status
Vicia sativa subsp. *sativa*	Spring vetch	FACU
Vicia villosa subsp. *villosa*	Winter vetch	UPL
Xanthium strumarium	Cocklebur	FAC

Attachment E

GIS Shapefiles and the Aquatic Resources Excel Spreadsheet (on CD)

Attachment F

Access Letter

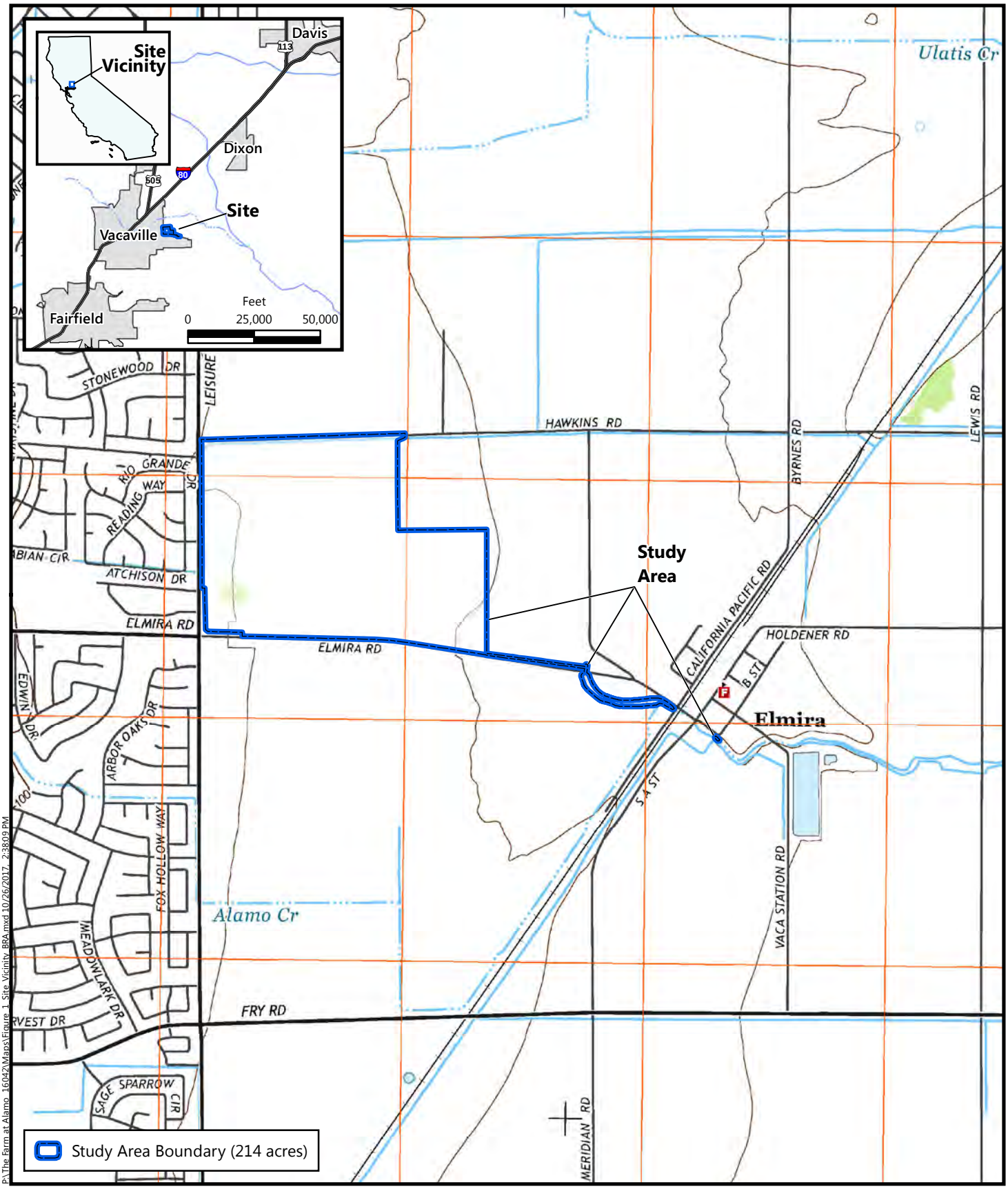
Project Manager
Regulatory Division
U.S. Army Corps of Engineers
1325 J Street, Room 1350
Sacramento, California 95814-2922

Re: The Farm at Alamo Creek Access

This letter serves as written permission to enter The Farm at Alamo Creek Property shown on the attached Figure 1 when accompanied by Madrone Ecological Consulting, LLC (Madrone) staff. When accompanied by Madrone staff, you may dig soil pits by hand and collect plant materials related to the verification of potential Waters of the U.S. on The Farm at Alamo Creek Property. If you have any questions, please contact Daria Snider at Madrone (916) 822-3230 or dsnider@madroneeco.com.

Sincerely,

Gary Rose



Source: United States Geologic Survey, 2015.
"Elmira, California" 7.5-Minute Topographic Quadrangle
Section 19, Township 6 North, Range 1 East, MDB&M
Section 24, Township 6 North, Range 1 West, MDB&M
Longitude -121.924576, Latitude 38.353867

Figure 1
Site Vicinity

The Farm at Alamo Creek
Solano County, California

MADRONE ECOLOGICAL CONSULTING

DRAFT

Biological Resources Assessment

The Farm at Alamo Creek

Solano County, California

October 2017

MADRONE ECOLOGICAL CONSULTING

Prepared for:
D.R. Stephens & Company
465 California St., Suite 330
San Francisco, California 94104

Recommended Citation:
Madrone Ecological Consulting, LLC (Madrone). 2017. *Draft Biological Resources Assessment for The Farm at Alamo Creek*. Prepared for D.R. Stephens & Company. Published on 26 October 2017.

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Attachments

1.0 INTRODUCTION

This report presents the results of a Biological Resources Assessment (BRA) conducted for The Farm at Alamo Creek Property and associated off-site areas (Study Area). The approximately 214-acre Study Area is located south of Hawkins Road, east of Leisure Town Road, and both north and south of Elmira Road in Solano County, California. The site is located within a portion of Section 19, Township 6 North, Range 1 East, and a portion of Section 24, Township 6 North, Range 1 West (MDB&M) of the "Elmira, California" 7.5·minute quadrangle (USGS 2015) (**Figure 1**).

1.1 Project Description

The Farm at Alamo Creek Specific Plan includes a mix of residential uses with a total of 768 single-family attached and detached residences on 129 acres with an average density of 3.6 dwelling units/acre, 26.6 acres in five parks, 5.1 miles of trails, 13.4 acres of open space and agricultural buffer, and 7.4 acres of neighborhood commercial, as shown on the Land Use Plan (**Attachment A**). In addition, the proposed project includes a 9.6-acre detention pond.

2.0 REGULATORY SETTING

This section describes federal, state and local laws and policies that are relevant to this assessment of biological resources.

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 protects species that are federally listed as endangered or threatened with extinction. FESA prohibits the unauthorized "take" of listed wildlife species. Take includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such activities. Harm includes significant modifications or degradations of habitats that may cause death or injury to protected species by impairing their behavioral patterns. Harassment includes disruption of normal behavior patterns that may result in injury to or mortality of protected species. Civil or criminal penalties can be levied against persons convicted of unauthorized "take." In addition, FESA prohibits malicious damage or destruction of listed plant species on federal lands or in association with federal actions, and the removal, cutting, digging up, damage, or destruction of listed plant species in violation of state law. FESA does not afford any protections to federally listed plant species that are not also included on a state endangered species list on private lands with no associated federal action.

2.1.2 Clean Water Act, Section 404

Section 404 of the Federal Clean Water Act requires that a Department of the Army permit be issued prior to the discharge of any dredged or fill material into waters of the United States, including wetlands. The U. S. Army Corps of Engineers (USACE) administers this program, with oversight from the U. S. Environmental Protection Agency. Waters of the United States include all navigable waters; interstate waters and wetlands; all intrastate waters and wetlands that could affect interstate or foreign commerce; impoundments of the above; tributaries of the above; territorial seas; and wetlands adjacent to the above.

2.1.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase or barter, any native migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11.). Likewise, Section 3513 of the California Fish & Game Code prohibits the "take or possession" of any migratory non-game bird identified under the MBTA. Therefore, activities that may result in the injury or mortality of native migratory birds, including eggs and nestlings, would be prohibited under the MBTA.

2.2 State Regulations

2.2.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires evaluations of project effects on biological resources. Determining the significance of those effects is guided by Appendix G of the CEQA guidelines. These evaluations must consider direct effects on a biological resource within the project site itself, indirect effects on adjacent resources, and cumulative effects within a larger area or region. Effects can be locally important but not significant according to CEQA if they would not substantially affect the regional population of the biological resource. Significant adverse impacts on biological resources would include the following:

- Substantial adverse effects on any species identified as candidate, sensitive, or special-status in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife (CDFW) or the U.S. Fish and Wildlife Service (USFWS) (these effects could be either direct or via habitat modification);
- Substantial adverse impacts to species designated by the California Department of Fish and Game (2009) as Species of Special Concern;
- Substantial adverse effects on riparian habitat or other sensitive habitat identified in local or regional plans, policies, or regulations or by CDFW and USFWS;
- Substantial adverse effects on federally protected wetlands defined under Section 404 of the Clean Water Act (these effects include direct removal, filling, or hydrologic interruption of marshes, vernal pools, coastal wetlands, or other wetland types);
- Substantial interference with movements of native resident or migratory fish or wildlife species population, or with use of native wildlife nursery sites;

- Conflicts with local policies or ordinances protecting biological resources (e.g. tree preservation policies); and
- Conflict with provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan.

2.2.2 State Endangered Species Act

With limited exceptions, the California Endangered Species Act (CESA) of 1984 protects state-designated endangered and threatened species in a way similar to FESA. For projects on private property (i.e. that for which a state agency is not a lead agency), CESA enables CDFW to authorize take of a listed species that is incidental to carrying out an otherwise lawful project that has been approved under CEQA (Fish & Game Code Section 2081).

2.2.3 Native Plant Protection Act

The Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA. The NPPA prohibits take of endangered or rare native plants, but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

2.2.4 Clean Water Act, Section 401

Section 401 of the Clean Water Act requires any applicant for a 404 permit in support of activities that may result in any discharge into waters of the United States to obtain a water quality certification with the Regional Water Quality Control Board (RWQCB). This program is meant to protect these waters and wetlands by ensuring that waste discharged into them meets state water quality standards. Because the water quality certification program is triggered by the need for a Section 404 permit (and both programs are a part of the Clean Water Act), the definition of waters of the United States under Section 401 is the same as that used by the USACE under Section 404.

2.2.5 California Water Code, Porter-Cologne Act

The Porter Cologne Act, from Division 7 of the California Water Code, requires any person discharging waste or proposing to discharge waste that could affect the quality of waters of the state to file a report of waste discharge (RWD) with the RWQCB. The RWQCB can waive the filing of a report, but once a report is filed, the RWQCB must either waive or adopt water discharge requirements (WDRs). "Waters of the state" are defined as any surface water or groundwater, including saline waters, within the boundaries of the state.

2.2.6 California Fish and Game Code, Section 1600 – Streambed and Lake Alteration

The CDFW is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code, Section 1602, requires notification to CDFW of any proposed activity that may substantially modify a river, stream, or lake. Notification is required by any person, business, state or local government agency, or public utility that proposes an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

For the purposes of Section 1602, rivers, streams and lakes must flow at least intermittently through a bed or channel. If notification is required and CDFW believes the proposed activity is likely to result in adverse harm to the natural environment, it will require that the parties enter into a Lake or Streambed Alteration Agreement (LSAA).

2.2.7 California Fish and Game Code, Section 3503.5 - Raptor Nests

Section 3503.5 of the Fish and Game Code makes it unlawful to take, possess, or destroy hawks or owls, unless permitted to do so, or to destroy the nest or eggs of any hawk or owl.

2.3 Local Regulations

2.3.1 City of Vacaville Tree Ordinance

The City of Vacaville (City) Tree Ordinance is found in Chapter 14.09.131 of their General Plan. It states that "For the purposes of this chapter, tree means any live woody plant having one or more well defined perennial stems with an aggregate circumference of 31 inches or more, when measured at 4-1/2 feet above ground level." Per the Tree Ordinance, "Prior to cutting down, removing, or destroying one or more trees on any property in the City, the property owner or the owner's authorized representative shall submit an application for a tree removal permit."

3.0 METHODOLOGY

3.1 Literature Review

A list of special-status species with potential to occur within the Study Area was developed by conducting a query of the following databases:

- California Natural Diversity Database (CNDDB) (CNDDB 2017) query of the Study Area and all areas within five miles of the Study Area (**Figures 2 and 3**);
- USFWS Information for Planning and Conservation (IPaC) (USFWS 2017a) query for the Study Area (**Attachment B**);

- California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (CNPS 2017) query of the "Elmira, California" USGS topo quadrangle, and the eight surrounding quadrangles (**Attachment C**); and
- Western Bat Working Group (WBWG) Species Matrix (WBWG 2017).

In addition, any special-status species that are known to occur in the region, but that were not identified in any of the above database searches were also analyzed for their potential to occur within the Project area.

For the purposes of this Biological Resources Assessment, special-status species is defined as those species that are:

- listed as threatened or endangered, or proposed or candidates for listing by the USFWS or National Marine Fisheries Service;
- listed as threatened or endangered and candidates for listing by CDFW;
- identified as Fully Protected species or species of special concern by CDFW;
- identified as Medium or High priority species by the WBWG (WBWG 2017); and
- plant species considered to be rare, threatened, or endangered in California by the CNPS and CDFW [California Rare Plant Rank (CRPR) 1, 2, and 3]:
  - CRPR 1A: Plants presumed extinct.
  - CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere.
  - CRPR 2A: Plants extirpated in California, but common elsewhere.
  - CRPR 2B: Plants rare, threatened, or endangered in California, but more common elsewhere.
  - CRPR 3: Plants about which the CNPS needs more information – a review list.

3.2 Field Surveys

Madrone senior biologist Daria Snider conducted field surveys of the Study Area on 16 November 2016 and 6 July, 17 August, and 19 October 2017 to assess the suitability of habitats on-site to support special-status species. Meandering pedestrian surveys were performed on foot and throughout the Study Area. A list of all wildlife species observed during the survey is included as **Attachment D**. Vegetation communities were classified in accordance with *The Manual of California Vegetation, Second Edition* (Sawyer, Keeler-Wolf and Evens 2009), and plant taxonomy was based on the nomenclature in the *Jepson eFlora* (Jepson Flora Project 2017).

4.0 GENERAL SITE CONDITIONS AND HABITAT

The Study Area is largely comprised of agricultural fields and Old Alamo Creek, with its associated Valley oak (*Quercus lobata*) riparian corridor. The agricultural fields were planted primarily in alfalfa (*Medicago sativa*) during the field visits. A few irrigation canals that convey water to and from the agricultural fields run through the portion of the Study Area north of Old Alamo Creek. A narrow strip of regularly-mowed non-native annual grassland occurs along the southern edge of a large portion of the Study Area, just north of Elmira Road. A small mesic area runs between Old Alamo Creek and what appears to be a stormdrain drop inlet within this annual grassland strip. A residential property is present in the southwestern corner of

the Study Area; this area has a number of buildings, scattered large Valley oak trees, and ornamental vegetation, but is otherwise largely unvegetated. Ruderal vegetation occurs in small patches, scattered throughout the Study Area, mostly on field edges, adjacent to portions of the irrigation canal, or between the riparian corridor and roadways.

Surrounding lands to the north, east and south are largely similarly agricultural with scattered rural residences, although a portion of the Study Area extends into and is surrounded by the rural community of Elmira. Properties to the west are developed. The Study Area is very flat, and slopes very slightly from west to east. Elevations range from 94 feet above mean sea level in the southwestern corner to approximately 70 feet at the eastern end, along Old Alamo Creek.

4.1 Terrestrial Vegetation Communities

4.1.1 Non-Native Annual Grassland

A narrow strip of non-native annual grassland occurs to the north of Elmira Road. This strip appears to be both the road right-of-way and a sewer or storm drain maintenance easement. As such, it was mowed during all of our field visits, and the dominant grasses were unidentifiable. However, it is assumed to be dominated by common annual grassland species in the area, such as soft brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), perennial ryegrass (*Festuca perennis*), and wild oats (*Avena fatua*). Forbs observed intermittently in this area include yellow star-thistle (*Centaurea solstitialis*), prickly wild lettuce (*Lactuca serriola*), and wild radish (*Raphanus sativus*). A mesic inclusion in this strip is occupied by different plant species, including slender wheatgrass (*Elymus trachycaulus*), sorghum (*Sorghum halepense*), prickly sow-thistle (*Helminthotheca echioides*), Bermuda grass (*Cynodon dactylon*), alkali mallow (*Malvella leprosa*), curly dock (*Rumex crispus*), spring vetch (*Vicia sativa*), and chicory (*Cichorium intybus*).

4.1.2 Valley Oak Riparian Woodland

A well-developed Valley oak (*Quercus lobata*) riparian woodland occurs along both sides of Old Alamo Creek for most of its length through the Study Area. Within the Study Area, this community is relatively diverse. Dominant tree species include Valley oak, Fremont's cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), red willow (*S. laevigata*), English walnut (*Juglans regia*), and black walnut (*Juglans hindsii*). Dominant shrubs in the understory include Himalayan blackberry (*Rubus armeniacus*), wild rose (*Rosa californica*), and sandbar willow (*Salix exigua*). Santa Barbara sedge (*Carex barbarae*) beds occupy large areas in the understory of this community, in between the Himalayan blackberry and the wild rose. The dense cover of these species leaves very little remaining space in the understory for other herbaceous vegetation. Other plant species observed relatively frequently in this community include cultivated almond (*Prunus dulcis*), olive (*Olea europaea*), blue elderberry (*Sambucus nigra* ssp. *cerulea*), tree of heaven (*Ailanthus altissima*), California bay laurel (*Umbellularia californica*), and eucalyptus (*Eucalyptus* species).

The portion of Old Alamo Creek south of Elmira Road supports a much more dense Valley oak riparian woodland. Although the large, overstory trees are consistent with the description above, the channel itself

has been rendered virtually inaccessible due to an extremely tall, dense thicket of Himalayan blackberry, and in areas along the northern edge of the creek, a dense sandbar willow thicket.

4.1.3 Ruderal

Ruderal vegetation occurs in small patches throughout the Study Area. This community is comprised largely of non-native forbs, but some grasses are also present. Plant species commonly observed in this community within the Study Area include wild radish, velvet leaf (*Abutilon theophrasti*), tomatillo (*Physalis philadelphica*), lambs quarters (*Chenopodium album*), bull mallow (*Malva nicaeensis*), prickly sow thistle, sorghum, wild oats, winter vetch (*Vicia villosa*), jungle rice (*Echinochloa colona*), chickweed (*Stellaria media*), henbit (*Lamium amplexicaule*), alkali mallow, sweet fennel (*Foeniculum vulgare*), and poison hemlock (*Conium maculatum*).

4.2 Aquatic Resources

Aquatic resources mapped within the Study Area are depicted in **Figure 4**. A total of 6.696 acres of aquatic resources were delineated within the Study Area (**Table 1**). A description of each of the aquatic resources types is included below.

Table 1. Aquatic Resources Mapped within the Study Area

Resource Type	Acreage
Old Alamo Creek	3.992
Irrigation Canal	2.426
Irrigation Ditch	0.154
Roadside Ditch	0.124
Total	**6.696**

4.2.1 Old Alamo Creek

Old Alamo Creek is an intermittent drainage that runs through the southern portion of the Study Area, and is bordered on both sides by a well-developed Valley oak woodland. In the central portion of the Study Area, this feature straightens out, and is bordered only by herbaceous vegetation. In the eastern portion of the Study Area, the channel of the creek is almost entirely obscured by Himalayan blackberry. Although some deeper portions of the creek appear to pond water perennially in stagnant pools, much of the creek through the Study Area dries out during the summer. The creek is quite broad through the woodland areas, ranging from 20-30 feet or more in width. In the central reach, it narrows down to just 10 feet wide.

4.2.2 Irrigation Canal

The Irrigation Canals that run through the Study Area convey water from the Solano Irrigation District's (SID's) Putah South Canal to agricultural fields both on-site and off-site. Portions of these canals are

concrete-lined, while other portions are well-maintained dirt-lined canals. As such, there is little to no vegetation within or on the banks of these features.

4.2.3 Irrigation Ditch

Irrigation Ditches in the southern portion of the Study Area appear to drain irrigation water from the southern agricultural fields into Old Alamo Creek. These features are much smaller than the irrigation canals, and although they are unvegetated within the channel, the banks are densely vegetated with weedy facultative species such as curly dock, sorghum, and prickly cocklebur.

4.2.4 Roadside Ditch

A roadside ditch is present along the northern border of the Study Area, just south of Hawkins Road. The roadside ditch collects runoff from Hawkins Road, and conveys it east through a series of off-site ditches into Ulatis Creek. This feature is primarily unvegetated due to ditch maintenance, but some ruderal vegetation has become established in portions. Plant species observed in and adjacent to this feature include pigweed amaranth (*Amaranthus albus*), wild radish, tall nutsedge, dallisgrass, and wild carrot (*Daucus carota*).

4.3 Soils

The Natural Resources Conservation Service has mapped five soil units within the Study Area (**Figure 5**); (BrA) Brentwood clay loam, 0 to 2% slopes; (Ca) Capay silty clay loam; (RoA) Rincon clay loam, 0 to 2% slopes; (Yo) Yolo loam; and (Yr) Yolo loam, clay substratum (NRCS 2017). None of these soils are considered more than very slightly alkaline in the surface layers, and none of them have serpentine parent materials (NRCS 2017).

5.0 RESULTS

Table 2 provides a list of special-status species that were evaluated, including their listing status, habitat associations, and their potential to occur in the study area. The following set of criteria was used to determine each species' potential for occurrence on the site:

- Present: Species occurs on the site based on CNDDB records, and/or was observed on the site during field surveys.
- High: The site is within the known range of the species and suitable habitat exists.
- Moderate: The site is within the known range of the species and very limited suitable habitat exists.
- Low: The site is within the known range of the species and there is marginally suitable habitat or the species was not observed during protocol-level surveys conducted on-site.
- No Habitat Present: The site does not contain suitable habitat for the species, or the site is outside the known range of the species.

Table 2. Special-Status Species with Potential to Occur within the Study Area

Scientific Name (Common Name)	Federal Status	State Status	Habitat Requirements	Potential for Occurrence
Plants				
Astragalus tener var. *ferrisiae* Ferris' milk-vetch	--	CRPR 1B.1	Alkaline flats, vernally moist meadows within foothill and valley grasslands. Usually occurs in wetlands.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Astragalus tener var. *tener* Alkali milk-vetch	--	CRPR 1B.2	Favors alkaline playas and vernal pools within valley and foothill grasslands with adobe clays. Also occurs in open, alkaline and seasonally moist meadows from 0 to 200 feet. Usually occurs in wetlands.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Atriplex cordulata var. *cordulata* Heartscale	--	CRPR 1B.2	Saline or alkaline chenopod scrub, meadows and seeps, or grasslands with sandy soils.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Atriplex depressa Brittlescale	--	CRPR 1B.2	Prefers meadows or grasslands with alkaline or saline clay soils.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Atriplex persistens Vernal pool smallscale	--	CRPR 1B.2	Vernal pools or other seasonal wetlands with alkaline soils.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
California macrophyllum Round-leaved filaree	--	CRPR 1B.2	Species found in cismontane woodlands, valley and foothill grassland with clay soils between 45 and 3,000 feet.	**No Habitat Present.** No grasslands or cismontane woodlands with an herbaceous understory are present within the Study Area.
Calochortus pulchellus Mt. Diablo fairy-lantern	--	CRPR 1B.2	Wooded slopes, though rarely found in chaparral.	**No Habitat Present.** No wooded slopes or chaparral present.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Centromadia parryi ssp. *congdonii* Congdon's tarplant	--	CRPR 1B.1	Foothill/valley grasslands often with alkaline and/or heavy clay soils.	**No Habitat Present.** Alkaline / saline or heavy clay soils are not present within the Study Area.
Centromadia parryi ssp. *parryi* Pappose tarplant	--	CRPR 1B.2	Found on alkaline soils in coastal prairie, meadows, seeps, coastal salt marshes, and valley/foothill grasslands.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Chloropyron molle ssp. *hispidum* Hispid bird's-beak	--	CRPR 1B.1	Prefers seasonally flooded, saline-alkaline soils at elevations below 500 feet.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Chloropyron molle ssp. *molle* *Soft bird's-beak*	FE	CR, CRPR 1B.2	Prefers seasonally flooded, saline-alkali soils at elevations below 500 feet. Blooms from June through September.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Cicuta maculata var. *bolanderi* Bolander's water-hemlock	--	CRPR 2B.1	Brackish or freshwater marshes and swamps.	**No Habitat Present.** No marshes or swamps are present within the Study Area.
Cirsium hydrophilum var. *hydrophilum* Suisun thistle	FE	CRPR 1B.1	Grows in salt marshes.	**No Habitat Present.** No salt marshes occur within the Study Area.
Delphinium recurvatum Recurved larkspur	--	CRPR 1B.2	Poorly drained, fine alkaline soils in grasslands between 9 and 2,400 feet.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Downingia pusilla Dwarf downingia	--	CRPR 2B.2	Vernal pools and other depressional seasonal wetlands.	**Low.** The mesic area in the southern portion of the Study Area represents extremely marginal habitat for this species.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Eriogonum truncatum Mt. Diablo buckwheat	--	CRPR 1B.1	Favors chaparral, coastal scrub, valley/foothill grasslands with dry and exposed very sandy soils.	**No Habitat Present.** Very sandy soils do not occur within the Study Area.
Extriplex joaquiniana San Joaquin spearscale	--	CRPR 1B.2	Found in seasonal alkali wetlands or alkali sink scrub.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Fritillaria liliacea *Fragrant fritillary*	--	CRPR 1B.2	Coastal scrub, valley and foothill grassland and coastal prairie; often found on serpentine soils; if growing in grasslands, it is often reported growing in alkaline clay soils.	**No Habitat Present.** Alkaline / saline or heavy clay soils are not present within the Study Area.
Fritillaria pluriflora Adobe-lily	--	CRPR 1B.2	Grows in chaparral, cismontane woodland, or foothill grasslands with clay or serpentine soils.	**No Habitat Present.** The Study Area is outside of the current known range of the species.
Gilia capitata ssp. *tomentosa* Woolly-headed gilia	--	CRPR 1B.1	Serpentine, rocky outcrops within coastal bluff scrub or valley/foothill grasslands. Blooms from May to July.	**No Habitat Present.** Serpentine soils do not occur within the Study Area.
Gratiola heterosepala Bogg's Lake hedge-hyssop	--	CE, CRPR 1B.2	Vernal pools and margins of lakes/ponds.	**No Habitat Present.** The Study Area lacks the aquatic habitats necessary to support this species.
Hesperolinon breweri Brewer's western flax	--	CRPR 1B.2	Grows in chaparral, cismontane woodland, or foothill grasslands usually with rocky serpentine soils.	**No Habitat Present.** Serpentine soils do not occur within the Study Area.
Hibiscus lasiocarpus var. occidentalis Rose-mallow	--	CRPR 1B.2	Species typically occurs in freshwater wetlands/marshes or other areas with wet soils.	**No Habitat Present.** No marshes are present within the Study Area and the creekbanks do not support appropriate habitat for this species.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Isocoma arguta Carquinez golden bush	--	CRPR 1B.1	Prefers foothill/valley grasslands with alkaline soils. Seems to favor low benches near drainages.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Lasthenia conjugens Contra Costa goldfields	FE	CRPR 1B.1	Vernal pools or other seasonal wetlands.	**Low.** The mesic area in the southern portion of the Study Area represents extremely marginal habitat for this species.
Lathyrus jepsonii var. *jepsonii* Delta tule pea	--	CRPR 1B.2	Species is restricted to freshwater or brackish marshes and swamps at or below 15 feet.	**No Habitat Present.** No marshes or swamps are present within the Study Area.
Legenere limosa Legenere	--	CRPR 1B.1	Vernal pools or other seasonal wetlands with prolonged inundation.	**No Habitat Present.** No seasonal wetlands with sufficient hydroperiod occur within the Study Area.
Lepidium latipes var. *heckardii* Heckard's pepper-grass	--	CRPR 1B.2	This annual prefers wet areas in valley and foothill grasslands with alkaline soils. This species almost always occurs in wetlands.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Lessingia hololeuca Woolly-headed lessingia	--	CRPR 3	Found primarily on serpentine soils in broadleaf upland forests, lower montane coniferous forest, coastal scrub, and valley and foothill grasslands.	**No Habitat Present.** Serpentine soils do not occur within the Study Area.
Lilaeopsis masonii Mason's lilaeopsis	--	CR, CRPR 1B.1	Prefers brackish or freshwater swamps, intertidal marshes, and riparian scrub at or below 35 feet.	**No Habitat Present.** No marshes or swamps are present within the Study Area.
Limosella australis Delta mudwort	--	CRPR 2B.1	Occurs in the Sacramento River delta on muddy banks in riparian scrub, or freshwater and brackish marshes.	**No Habitat Present.** Outside of the known range of the species.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Microseris paludosa Marsh microseris	--	CRPR 1B.2	Coastal scrub, valley and foothill grassland, closed-cone coniferous forest, and cismontane woodland.	**No Habitat Present.** Outside of the known range of the species.
Myosurus minimus ssp. apus Little mousetail	--	CRPR 3.1	Alkaline vernal pools.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	--	CRPR 1B.1	This annual herb grows in vernal pools and mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, and valley and foothill grasslands.	**Low.** The mesic area in the southern portion of the Study Area represents extremely marginal habitat for this species.
Neostapfia colusana Colusa grass	FT	CE, CRPR 1B.1	In the dry bottoms of large/deep vernal pools and other seasonally flooded features.	**No Habitat Present.** No seasonal wetlands with sufficient hydroperiod occur within the Study Area.
Orcuttia inaequalis San Joaquin Valley Orcutt grass	FT	CE, CRPR 1B.1	In the dry bottoms of large/deep vernal pools and other seasonally flooded features.	**No Habitat Present.** No seasonal wetlands with sufficient hydroperiod occur within the Study Area.
Plagiobothrys hystriculus Bearded popcorn-flower	--	CRPR 1B.1	Vernal pools or other seasonal wetlands.	**Low.** The mesic area in the southern portion of the Study Area represents extremely marginal habitat for this species.
Puccinellia simplex California alkali grass	--	CRPR 1B.2	Alkaline sinks, flats, and lake margins, vernal pools, meadows, seeps, and riparian wetlands.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Sidalcea keckii Keck's checkerbloom	FE	CRPR 1B.1	Cismontane woodland, valley and foothill grassland; often found in serpentine soils at elevations between 240 and 2,150 feet.	**No Habitat Present.** Outside of the elevational range of the species.
Spergularia macrotheca var. *longistyla* Long-styled sand-spurrey	--	CRPR 1B.2	Alkaline meadows, seeps, marshes, and swamps.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Stuckenia filiformis ssp. *alpina* Slender-leaved pondweed	--	CRPR 2B.2	Marshes, swamps, and shallow clear water of lakes and drainage channels.	**No Habitat Present.** The Study Area lacks the aquatic habitats necessary to support this species.
Symphyotrichum lentum Suisun Marsh aster	--	CRPR 1B.2	Fresh and salt water marshes, often associated with blackberries, cattails, and bulrush.	**No Habitat Present.** No marshes are present within the Study Area.
Trifolium amoenum Two-fork clover	FE	CRPR 1B.1	Grows in wet swales within foothill/valley grasslands and coastal bluff scrub. Sometimes found on serpentine soils.	**No Habitat Present.** Outside of the known range of the species.
Trifolium hydrophilum Saline clover	--	CRPR 1B.2	Marshes, swamps, and vernal pools with alkaline soils.	**No Habitat Present.** Alkaline / saline soils are not present within the Study Area.
Tuctoria mucronata Crampton's tuctoria	FE	CE, CRPR 1B.1	In the dry bottoms of large/deep vernal pools and other seasonally flooded features.	**No Habitat Present.** No seasonal wetlands with sufficient hydroperiod occur within the Study Area.
Viburnum ellipticum Oval-leaved viburnum	--	CRPR 2B.3	Prefers chaparral and cismontane woodlands, and lower cismontane coniferous forests at elevations from 700 feet to 4,600 feet.	**No Habitat Present.** Outside of the elevational range of the species.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Invertebrates				
Branchinecta conservatio Conservancy fairy shrimp	FE	--	Vernal pools or other seasonally ponded wetlands.	**No Habitat Present.** No vernal pools are present.
Branchinecta lynchi Vernal pool fairy shrimp	FT	--	Vernal pools or other seasonally ponded wetlands.	**No Habitat Present.** No vernal pools are present.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT	--	Dependent upon elderberry plant as primary host species.	**Low.** Several elderberry shrubs are present within the Study Area; however, no exit holes indicative of this species have been observed on any of the shrubs, and this species has not been documented within the immediate vicinity of the Study Area.
Elaphrus viridis Delta green ground beetle	FT	--	Sandy mud substrate associated with the margins of vernal pools with low vegetative cover.	**No Habitat Present.** No vernal pools are present.
Lepidurus packardi Vernal pool tadpole shrimp	FE	--	Vernal pools or other seasonally ponded wetlands.	**No Habitat Present.** No vernal pools are present.
Fish				
Hypomesus transpacificus Delta smelt	FT	CE	Adults are found in the brackish open surface waters of the Delta and Suisun Bay. Though spawning has never been observed, it is believed to occur in tidally influenced sloughs and drainages on the freshwater side of the mixing zone.	**No Habitat Present.** No tidally influenced sloughs or drainages are present within the Study Area.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Oncorhynchus mykiss irideus Central Valley steelhead	FE	--	Anadromous species requiring freshwater water courses with gravelly substrates for breeding. The young remain in freshwater areas before migrating to estuarine and marine environments.	**No Habitat Present.** Alamo Creek represents potentially suitable habitat for this species, but fish passage barriers downstream preclude the presence of anadromous fish (LSA 2008).
Amphibians				
Ambystoma californiense California tiger salamander	FT	CT	Breeds in ponds or other deeply ponded wetlands, and uses gopher holes and ground squirrel burrows in adjacent grasslands for upland refugia/foraging.	**No Habitat Present.** No ponds occur within the Study Area, and the intensive agriculture within and surrounding the Study Area would preclude this species' presence in upland areas.
Rana draytonii California red-legged frog	FT	CSC	Breeds in permanent to semi-permanent aquatic habitats including lakes, ponds, marshes, creeks, and other drainages.	**No Habitat Present.** Outside of the known range of the species (LSA 2012).
Reptiles				
Emys marmorata Western pond turtle	--	CSC	Ponds, rivers, streams, wetlands, and irrigation ditches with associated marsh habitat.	**High.** Alamo Creek provides suitable habitat for this species.
Thamnophis gigas Giant garter snake	FT	CT	Rivers, canals, irrigation ditches, rice fields, and other aquatic habitats with slow moving water and heavy emergent vegetation.	**No Habitat Present.** Outside of the known range of the species (LSA 2012).

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Birds				
Agelaius tricolor Tricolored blackbird	--	CC, CSC	Colonial nester in cattails, bulrush, or blackberries associated with marsh habitats.	**Low.** Blackberry thickets along Old Alamo Creek provide marginally suitable nesting habitat, and adjacent fields provide suitable foraging habitat.
Aquila chrysaetos Golden eagle	--	CFP	Forages in open areas including grasslands, savannahs, deserts, and early successional stages of shrub and forest communities. Nests in large trees and cliffs.	**Low.** The Study Area lacks suitable breeding habitat, but the agricultural fields represent marginally-suitable foraging habitat.
Asio flammeus Short-eared owl	--	CSC	Typically found in open areas with few trees such as grasslands, prairies, dunes, meadows, and croplands.	**High.** The agricultural fields provide suitable winter foraging habitat.
Athene cunicularia Burrowing owl	--	CSC	Nests in abandoned ground squirrel burrows, rubble/debris piles, abandoned tires, and culverts pipes associated with open grassland habitats.	**High.** Although few ground squirrel burrows were observed, those that are present provide suitable habitat, and debris scattered throughout the Study Area could provide artificial burrows. The agricultural fields provide suitable foraging habitat.
Buteo regalis Ferruginous hawk	--	CSC	A wintering species in California. Forages in open areas such as grasslands and fields for ground squirrels as well as other small mammals, birds, lizards, snakes, and rabbits.	**High.** The agricultural fields provide suitable winter foraging habitat.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Buteo swainsoni Swainson's hawk	--	CT	Nests in large trees, preferably in riparian areas. Forages in fields, cropland, irrigated pasture, and grassland near large riparian corridors.	**Present.** Species was observed foraging within the Study Area. The trees throughout the Study Area (but especially along Alamo Creek) provide suitable nesting habitat, and the agricultural fields and annual grasssland provide suitable foraging habitat.
Charadrius montanus Mountain plover	--	CSC	Species nests/breeds in the Great Basin and migrates to California in the winter. It prefers grasslands and farmlands were it forages for insects.	**High.** The agricultural fields provide suitable winter foraging habitat.
Circus cyaneus Northern harrier	--	CSC	Nests in emergent wetland/marsh, open grasslands, or savannah habitats. Forages in open areas such as marshes, agricultural fields, and grasslands.	**Present.** Species was observed foraging within the Study Area. The agricultural fields and annual grasssland within the Study Area provide suitable nesting and foraging habitat.
Elanus leucurus White-tailed kite	--	CFP	Open grasslands, fields, and meadows are used for foraging. Isolated trees in close proximity to foraging habitat are used for perching and nesting.	**High.** The trees throughout the Study Area provide suitable nesting habitat, and the agricultural fields and annual grasssland provide suitable foraging habitat.
Falco peregrinus anatum American peregrine falcon	FD	CFP	Nests on cliff ledges, tall buildings, or other tall man-made structures near open areas for foraging.	**No Habitat Present.** Suitable breeding habitat and foraging habitat are absent.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Haliaeetus leucocephalus Bald eagle	FD	CE, CFP	Nest in large trees within 1 mile of lakes, rivers, or larger streams. Forages in nearby open areas.	**No Habitat Present.** Suitable breeding habitat and foraging habitat are absent.
Ixobrychus exilis Least bittern	--	CSC	Freshwater and brackish marshes with dense, tall growths of emergent vegetation, interspersed with clumps of woody vegetation and open water.	**No Habitat Present.** No marshes are present in or near the Study Area.
Lanius ludovicianus Loggerhead shrike	--	CSC	Occurs in open areas with sparse trees, shrubs, and other perches.	**High.** Habitas throughout the Study Area are suitable for this species.
Laterallus jamaicensis coturniculus California black rail	--	CT	Nests and forages in salt, brackish, and fresh marshes with abundant vegetative cover.	**No Habitat Present.** No marshes are present in or near the Study Area.
Rallus longirostris obsoletus California clapper rail	FE	CE	Prefers brackish or saltwater marshes associated with tidal sloughs and dominated by pickleweed.	**No Habitat Present.** No marshes are present in or near the Study Area.
Mammals				
Antrozous pallidus Pallid bat	--	CSC, WBWG H	Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of coast redwoods and giant sequoias, bole cavities of oaks, exfoliating Ponderosa pine and valley oak bark, deciduous trees in riparian areas, and fruit trees in orchards), and various human structures such as bridges (especially wooden and concrete girder designs), barns, porches, bat boxes, and human-occupied as well as vacant buildings (WBWG 2017).	**High.** Suitable roosting habitat for this species is present in tree hollows and under exfoliating bark on trees throughout the site, but especially in the riparian corridor.

Scientific Name **(Common Name)**	**Federal Status**	**State Status**	**Habitat Requirements**	**Potential for Occurrence**
Lasionycteris noctivagans Silver-haired bat	--	WBWG M	Roosts in abandoned woodpecker holes, under bark, and occasionally in rock crevices. It forages in open wooded areas near water features.	**High.** Suitable roosting habitat for this species is present in tree hollows and under exfoliating bark on trees throughout the site.
Lasiurus blossevillii Western red bat	--	CSC, WBWG H	Require large leaf trees such as cottonwoods, willows, and fruit/nut trees for daytime roosts. Often associated with wooded habitats that are protected from above and open below. Often found in association with riparian corridors. Require open space for foraging.	**High.** Suitable roosting habitat for this species is present in tree hollows and under exfoliating bark on trees throughout the site, but especially in the riparian corridor.
Lasiurus cinereus Hoary bat	--	WBWG M	Roosts primarily in foliage of both coniferous and deciduous trees at the edges of clearings (WBWG 2017).	**High.** Trees within the riparian area are suitable roosting habitat for this species.
Taxidea taxus American badger	--	CSC	This species prefers dry open fields, grasslands, and pastures.	**No Habitat Present.** The frequency of disking and other human activity would preclude this species' presence.

Status Codes:

CC - CDFW Candidate for Listing
CE - CDFW Endangered
CFP - CDFW Fully Protected
CR - CDFW Rare
CRPR - California Rare Plant Rank
CSC - CDFW Species of Concern
CT - CDFW Threatened
FD - Federally Delisted
FE - Federally Endangered
FT - Federally Threatened
WBWG M - Western Bat Working Group Medium Threat Rank
WBWG H - Western Bat Working Group High Threat Rank

Figures 2 and 3 are exhibits displaying CNDDB occurrences within five miles of the study area. Below is a discussion for all special-status plant and animal species with potential to occur on the site.

5.1 Plants

5.1.1 Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is not federally or state listed, but it is classified as a CRPR List 1B.2 plant. It is a diminutive annual herb that is strongly associated with vernal pools and other seasonally inundated features at elevations ranging from sea level to approximately 1,500 feet (CNPS 2017). Dwarf downingia is typically associated with areas that experience a moderate degree of disturbance, and it blooms from March to May.

The mesic area just north of Elmira Road represents marginally suitable habitat for this species. Protocol-level surveys conducted throughout the Study Area did not detect this species (Madrone 2017a).

5.1.2 Contra Costa Goldfields

Contra Costa goldfields (*Lasthenia conjugens*) is federally endangered and a CRPR List 1B.1 plant. Contra Costa goldfields is found in vernal pools, alkaline playas, and other mesic areas in cismontane woodland and valley and foothill grasslands at elevations between sea level and 1,540 feet (CNPS 2017). This annual herb blooms from March through June (CNPS 2017).

The mesic area just north of Elmira Road represents marginally suitable habitat for this species. Protocol-level surveys conducted throughout the Study Area did not detect this species (Madrone 2017a).

5.1.3 Baker's Navarretia

Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*) is not federally or state listed, but it is classified as a CRPR List 1B.1 plant. Baker's navarretia is found in vernal pools and other mesic areas in cismontane woodland, lower montane coniferous forest, and valley and foothill grasslands at elevations between 15 and 5,700 feet (CNPS 2017). This annual herb blooms from April through July (CNPS 2017).

The mesic area just north of Elmira Road represents marginally suitable habitat for this species. Field surveys conducted by a botanist during the blooming season failed to detect this species. CNDDB Occurrence 33 of this species occurs within the Study Area (CDFW 2017). The exact location of this occurrence is unknown, and it was last documented in 1962 (CDFW 2017). No suitable habitat occurs within the portion of the Study Area that intersects this occurrence.

5.1.4 Bearded Popcorn Flower

Bearded popcorn flower (*Plagiobothrys hystriculus*) is not federally or state listed, but it is classified as a CRPR List 1B.1 plant. Bearded popcorn flower is found in vernal swales and along the upper edges of vernal pools at elevations between sea level and 900 feet (CNPS 2017). This annual herb blooms from April through May (CNPS 2017).

The mesic area just north of Elmira Road represents marginally suitable habitat for this species. Protocol-level surveys conducted throughout the Study Area did not detect this species (Madrone 2017a).

5.2 Invertebrates

5.2.1 Valley Elderberry Longhorn Beetle

The Valley elderberry longhorn beetle (VELB) is listed as threatened pursuant to the federal Endangered Species Act. The historic range of this beetle is limited to moist Valley oak woodlands along margins of rivers and streams in the lower Sacramento and lower San Joaquin Valleys (USFWS 1984). At the time of its listing, the beetle was known from fewer than 10 localities in Merced, Sacramento, and Yolo Counties (USFWS 1980). Its current distribution is patchy throughout California's Central Valley and associated foothills (USFWS 1999).

The VELB is completely dependent on its host plant, elderberry (*Sambucus* species), which occurs in riparian and other woodland communities in California's Central Valley and the associated foothills (USFWS 1999). Female beetles lay their eggs in crevices on the stems or on the leaves of living elderberry plants. When the eggs hatch, larvae bore into stems with a diameter of one inch or more. The larval stages last for one to two years. The fifth instar larvae create emergence holes in the stems and then plug the holes and remain in the stems through pupation (Talley 2003). Adults emerge through the emergence holes from late March through June. The short-lived adult beetles forage on leaves and flowers of elderberry shrubs.

Eighteen elderberry shrubs with stems one inch diameter or greater were located within the Study Area (**Figure 6**). These shrubs represent suitable habitat for VELB; however, no exit holes were observed on any of the shrubs, which indicates that they are not currently being utilized by the VELB (Madrone 2017b).

5.3 Reptiles

5.3.1 Western Pond Turtle

The western pond turtle (*Emys marmorata*) is not federally or state listed, but is a CDFW species of special concern. Its favored habitats include streams, large rivers and canals with slow-moving water, aquatic vegetation, and open basking sites (Jennings and Hayes 1994). Although the turtles must live near water, they can tolerate drought by burrowing into the muddy beds of dried drainages. This species feeds mainly on invertebrates such as insects and worms, but will also consume small fish, frogs, mammals and some

plants. Western pond turtle predators include raccoons, coyotes, raptors, weasels, large fish, and bullfrogs. This species breeds from mid to late spring in adjacent open grasslands or sandy banks (Jennings and Hayes 1994).

Old Alamo Creek throughout the Study Area represents suitable habitat for western pond turtle.

5.4 Birds

5.4.1 Golden Eagle

The golden eagle (*Aquila chrysaetos*) is not federally or state listed, but is a CDFW species of special concern and a fully protected species. It is a very large solitary raptor which forages in large, expansive open grasslands and savannahs, and nests on cliff ledges or in large, lone trees in rolling to mountainous terrain (Shuford and Gardali 2008). Though its natural densities are generally believed to be low, it once was relatively common to the open areas of California.

The agricultural fields and non-native annual grasslands within the Study Area are suitable foraging habitat.

5.4.2 Swainson's Hawk

Swainson's hawk (*Buteo swainsoni*) is a raptor species that is not federally listed, but is listed as threatened by CDFW. Breeding pairs typically nest in tall trees associated with riparian corridors, and forage in grassland, irrigated pasture, and cropland with a high density of rodents (Shuford and Gardali 2008). The Central Valley populations breed and nest in the late spring through early summer before migrating to Central and South America for the winter (Shuford and Gardali 2008).

Trees throughout the Study Area provide suitable nesting habitat for Swainson's hawk, and the agricultural fields and non-native annual grasslands are suitable foraging habitat. Swainson's hawk were observed foraging within the Study Area during the field surveys, and a Swainson's hawk nest was reported in 2001 in a clump of eucalyptus trees along the north edge of Old Alamo Creek within the Study Area (CNDDB Occurrence #1926) (CNDDB 2017).

5.4.3 Northern Harrier

The northern harrier *(Circus cyaneus)* is not listed pursuant to either the California or federal Endangered Species Acts; however, it is considered to be a species of special concern by the CDFW. This species is known to nest within the Central Valley, along the Pacific Coast, and in northeastern California (Shuford and Gardali 2008). The northern harrier is a ground nesting species, and typically nests in emergent wetland/marsh, open grasslands, or savannah habitats. Foraging occurs within a variety of open habitats such as marshes, agricultural fields, and grasslands (Shuford and Gardali 2008).

The agricultural fields and non-native annual grassland within the Study Area are suitable nesting and foraging habitat for this species.

5.4.4 White-Tailed Kite

White-tailed kite (*Elanus leucurus*) is not federally or state listed, but is a CDFW fully protected species. This species is a yearlong resident in the Central Valley and is primarily found in or near foraging areas such as open grasslands, meadows, farmlands, savannahs, and emergent wetlands (Shuford and Gardali 2008). White-tailed kites typically nest from March through June in trees within riparian, oak woodland, and savannah habitats of the Central Valley and Coast Range (Shuford and Gardali 2008).

Trees throughout the Study Area are suitable nesting habitat for white-tailed kite, and the agricultural fields and non-native annual grasslands are suitable foraging habitat.

5.4.5 Burrowing Owl

Burrowing owl (*Athene cunicularia*) is not listed pursuant to either the California or federal Endangered Species Acts; however, it is designated as a species of special concern by the CDFW. They typically inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel, but may also use man-made structures such as culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement (CDFG 1995). The breeding season extends from February 1 through August 31 (CBOC 1993, CDFG 1995).

California ground squirrel (*Otospermophilus beecheyi*) burrows are not common in the Study Area, but a few are present, and are of sufficient size to provide suitable burrows for burrowing owl. In addition, occasional debris piles scattered throughout the Study Area represent marginally suitable nesting habitat. The agricultural fields and non-native annual grasslands within the Study Area provide suitable foraging habitat.

5.4.6 Loggerhead Shrike

The loggerhead shrike *(Lanius ludovicianus)* is not listed and protected pursuant to either the California or federal Endangered Species Acts; but is a CDFW species of special concern. Loggerhead shrikes nest in small trees and shrubs in woodland and savannah vegetation communities, and forage in open habitats throughout California (Shuford and Gardali 2008). The nesting season ranges from March through June.

Trees throughout the Study Area are suitable nesting habitat for loggerhead shrike, and the agricultural fields and non-native annual grassland are suitable foraging habitat.

5.4.7 Tricolored Blackbird

Tricolored blackbirds (*Agelaius tricolor*) are not federally listed, but are candidates for listing as endangered under the California endangered species act. In addition, tricolored blackbird is listed by CDFW as a species of special concern. They are colonial nesters preferring to nest in dense stands of cattails, bulrush, or blackberry thickets associated with perennial water (Shuford and Gardali 2008).

Blackberry brambles in the understory of the Valley oak riparian woodland represent marginally suitable nesting habitat for tricolored blackbirds. The agricultural fields and non-native annual grassland are suitable foraging habitat.

5.4.8 Common Raptor Species

Common raptors and their nests are protected by Section 3503.5 of the Fish and Game Code of California and by the Federal Migratory Bird Treaty Act. These raptor species include red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*B. lineatus*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*), among others. In general, raptor nesting occurs from late February/early March through late July/early August, depending upon the species and various environmental conditions. Potential nesting habitat for these species is present in the trees throughout the Study Area.

5.4.9 Winter-Foraging Birds

A number of special-status birds have the potential to utilize the annual grasslands throughout the Study Area for winter foraging. These birds include ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), short-eared owl (*Asio otus*), and mountain plover (*Charadrius montanus*).

5.5 Mammals

5.5.1 Pallid Bat

Pallid bat (*Antrozous pallidus*) is not federally or state listed, but is considered a CDFW species of special concern, and is classified by the WBWG as a High priority species. It favors roosting sites in crevices in rock outcrops, caves, abandoned mines, hollow trees, and human-made structures such as barns, attics, and sheds (WBWG 2017). Though pallid bats are gregarious, they tend to group in smaller colonies of 10 to 100 individuals. It is a nocturnal hunter and captures prey in flight, but unlike most American bats, the species has been observed foraging for flightless insects, which it seizes after landing (WBWG 2017).

Suitable roosting habitat for this species is present in tree hollows and under exfoliating bark on trees throughout the Study Area.

5.5.2 Silver-Haired Bat

Silver-haired bat (*Lasionycteris noctivagans*) is not federally or state listed, but is classified by the WBWG as a Medium priority species. Primarily considered a coastal and montane forest species, the silver-haired bat occurs in more xeric environments during winter and seasonal migrations (WBWG 2017). It roosts in abandoned woodpecker holes, under bark, and occasionally in rock crevices. This insectivore's favored foraging sites include open wooded areas near water features (WBWG 2017).

Suitable roosting habitat for this species is present in tree hollows and under exfoliating bark on trees throughout the Study Area.

5.5.3 Western Red Bat

Western red bat (*Lasiurus blossevillii*) is not federally or state listed, but is considered a CDFW species of special concern, and is classified by the WBWG as a High priority species. Western red bat is typically solitary, roosting primarily in the foliage of trees or shrubs (WBWG 2017). Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores) (WBWG 2017).

Trees throughout the Study Area are suitable roosting habitat for western red bat.

5.5.4 Hoary Bat

The hoary bat (*Lasiurus cinereus*) is not federally or state listed, but is classified by the WBWG as a Medium priority species. It is considered to be one of the most widespread of all American bats with a range extending from Canada to central Chile and Argentina as well as Hawaii (WBWG 2017). Hoary bats prefer older large leaf trees, such as cottonwoods, willows, and fruit or nut trees for daytime roosts. This species is primarily crepuscular or nocturnal and requires open areas to hunt its main prey item, moths. The hoary bat is considered a forest/woodland species, and in California they are often associated with undisturbed riparian or stream corridors (WBWG 2017).

Trees within the Valley oak riparian woodland are suitable roosting habitat for hoary bat.

6.0 IMPACTS TO SENSITIVE BIOLOGICAL RESOURCES

This section details potential impacts to the biological resources discussed above associated with implementation of the Proposed Project, as detailed in **Section 1.1**, and shown in **Attachment A**. Vegetation communities that would be impacted include the agricultural fields, annual grassland, the irrigation canals, irrigation ditches, and roadside ditches. Much of the Valley oak riparian woodland would be retained, but some portions would be impacted.

6.1 Aquatic Resources

All of the irrigation canals, irrigation ditches, and roadside ditches would be filled. Small portions of Old Alamo Creek will be filled to accommodate crossings and to replace undersized culverts, and extensive vegetation thinning will occur within the creek to improve water flow.

6.2 Special-Status Plant Species

The vegetation communities proposed for impact represent marginally suitable habitat for the following special-status plant species: dwarf downingia, Contra Costa goldfields, Baker's navarretia, and bearded popcorn flower. As protocol-level surveys for these species failed to detect them, no impacts to these species are anticipated.

6.3 Valley Elderberry Longhorn Beetle

Eighteen elderberry shrubs with stems greater than 1 inch in diameter were mapped on-site (**Figure 6**), and represent potential habitat for VELB. Based on the Proposed Land Use Plan (**Attachment A**), it appears that all of the shrubs will be avoided. It is unknown how close construction activities could come to shrubs that remain. Construction activities that occur within 20 feet of elderberry shrubs could indirectly effect VELB, if they were present.

6.4 Western Pond Turtle

Old Alamo Creek is suitable habitat for western pond turtle. Based on the Proposed Land Use Plan (**Attachment A**), it appears that a portion of Old Alamo Creek will be impacted. If western pond turtles were present during construction, individual turtles could be injured or killed. Furthermore, thinning of riparian vegetation within the portion of Old Alamo Creek south of Elmira Road could damage turtle nests, if they were present.

6.5 Winter Foraging Birds

A number of special-status birds have the potential to forage in winter within the agricultural fields and non-native annual grassland within the Study Area. The Proposed Project will impact all of these areas, and convert them to residential uses.

6.6 Swainson's Hawk

The agricultural fields and non-native annual grassland within the Project Area represents suitable foraging habitat for Swainson's hawk, and trees represent potential nesting habitat. The Proposed Project will impact most of these areas, and convert them to residential uses.

6.7 Other Nesting Raptors

Trees throughout the Study Area represent potential nesting habitat for special-status and common raptors. If active raptor nests were present in trees to be removed by, or in the immediate vicinity of Project construction, they could be impacted.

6.8 Nesting Songbirds

Loggerhead shrike and tri-colored blackbird have potential to nest on-site, as do other more common bird species protected by the MTBA. If active songbird nests were present in trees or shrubs to be removed by, or in the immediate vicinity of Project construction, they could be impacted.

6.9 Roosting Special-Status Bats

Trees throughout the Study Area are habitat for various special-status bats species. If special-status bats were roosting in trees to be removed by Project construction, they could be injured or killed when the trees are cut down.

7.0 MITIGATION FOR IMPACTS TO SENSITIVE BIOLOGICAL RESOURCES

The following are recommended mitigation measures for impacts to sensitive biological resources associated with implementation of the Proposed Project (Section 1.1 and **Attachment A**).

7.1 Aquatic Resources

1. The Project applicant shall delineate the extent of Waters to be impacted by the proposed Project and, if required, apply for a Section 404 permit from the USACE. Waters that would be lost or disturbed shall be replaced or rehabilitated on a "no-net-loss" basis. Habitat restoration, rehabilitation, and/or replacement shall be at a location and by methods acceptable to the USACE.
2. If necessary, the applicant shall obtain a Section 401 water quality certification from the RWQCB.
3. If necessary, the applicant shall obtain a Lake and Streambed Alteration Agreement from CDFW.
4. The Project applicant shall provide written evidence to the City that this measure has been complied with as applicable prior to final grading plan approval.

7.2 Valley Oak Riparian Woodland

Impacts to any portion of the Valley Oak Riparian Woodland would likely require a LSAA from CDFW. If impacts to the Valley Oak Riparian Woodland are proposed, the Applicant shall obtain a LSAA from CDFW or provide evidence that CDFW has determined that no LSAA is necessary.

7.3 Tree Removal

If any trees that would be subject to the City's Tree Ordinance (detailed in **Section 2.3.1**) are proposed for removal as part of this Project, an Arborist Survey of these trees shall be prepared and submitted to the City along with an application for a Tree Removal Permit.

7.4 Worker Environmental Awareness Training

Prior to any ground-disturbing or vegetation-removal activities, a Worker Environmental Awareness Training (WEAT) shall be prepared and administered to the construction crews. The WEAT will include the following: discussion of the state and federal Endangered Species Act, the Clean Water Act, the Project's permits and CEQA documentation, and associated mitigation measures; consequences and penalties for violation or noncompliance with these laws and regulations; identification of special-status wildlife, location of any avoided Waters of the U.S. and elderberry shrubs; hazardous substance spill prevention and containment measures; and the contact person in the event of the discovery of a special-status wildlife species. The WEAT will also discuss the different habitats used by the species' different life stages and the annual timing of these life stages. A handout summarizing the WEAT information shall be provided to workers to keep on-site for future reference. Upon completion of the WEAT training, workers will sign a form stating that they attended the training, understand the information presented and will comply with the regulations discussed. Workers will be shown designated "avoidance areas" during the WEAT training; worker access should be restricted to outside of those areas to minimize the potential for inadvertent environmental impacts. Fencing and signage around the boundary of avoidance areas may be helpful.

7.5 Valley Elderberry Longhorn Beetle

All elderberry shrubs (which are defined for the purposes of this section as those with stems greater than 1 inch in diameter) shall be avoided completely during Project construction with a buffer of at least 20 feet, and the following avoidance and minimization measures shall be implemented for all work within 165 feet of a shrub:

- All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.
- Activities that could damage or kill an elderberry shrub (e.g., trenching, paving, etc.) shall receive an avoidance area of at least 20 feet from the drip-line.
- A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for noncompliance.
- A qualified biologist will monitor the work area at project appropriate intervals to assure that all avoidance and minimization measures are implemented.
- As much as feasible, all activities within 165 feet of an elderberry shrub will be conducted between August and February.
- Elderberry shrubs will not be trimmed.

- Herbicides will not be used within the drip-line of the shrub. Insecticides will not be used within 100 feet of an elderberry shrub.
- Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

If either a 20-foot diameter avoidance area around any elderberry shrub is found later to not be feasible or an elderberry shrub must be removed to accommodate construction, then the applicant shall notify the City and implement additional mitigation measures required by the City based on the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (USFWS 2017b) after consultation with USFWS.

7.6 Western Pond Turtle

In any impacts are proposed within Old Alamo Creek, a western pond turtle survey of the creek and any adjacent riparian areas where work will occur shall be conducted within 48 hours prior to construction. If no western pond turtles or nests are found within the portion of Old Alamo Creek north of Elmira Road, no further mitigation is necessary. The impenetrable vegetation in and around the portion of Old Alamo Creek south of Elmira Road renders access to this area quite limited, and the results of any survey of this area may be inconclusive. Therefore, if the biologist cannot conduct a comprehensive survey, a biological monitor shall be present during vegetation thinning along this stretch of Old Alamo Creek. If a western pond turtle is observed within the proposed impact area, a qualified biologist shall relocate the individual to another portion of the creek outside of the proposed impact area prior to construction. If a western pond turtle nest is observed within the proposed impact area, the nest shall be fenced off and avoided if possible. If avoidance is not possible, the City shall determine appropriate mitigation.

7.7 Nesting Raptors and Other Birds

If ground disturbance, vegetation thinning, or other construction activities are proposed during the bird nesting season (February 1 – August 31), a focused survey for nesting raptors (including Swainson's hawks and burrowing owls) and migratory bird nests shall be conducted by a qualified biologist within 30 days prior to the beginning of construction activities in order to identify active nests. This survey shall be conducted within the proposed construction area and all accessible areas within 500 feet of the construction area. If active raptor nests are found, no construction activities shall take place within 500 feet of the nest until the young have fledged. If active burrowing owl burrows are found, a 250-foot no-disturbance buffer will be established, and if active songbird nests are found, a 100-foot no disturbance buffer will be established. These no-disturbance buffers may be reduced based on approval by the City. The perimeter of the protected area shall be indicated by bright orange temporary fencing. No construction activities or personnel shall enter the protected area, except with approval of the biologist. If tree removal is necessary, trees containing nests, or burrows that must be removed as a result of project implementation shall be removed during the nonbreeding season (late September to March). If no active nests are found during the focused survey, no further mitigation will be required.

In addition, a targeted Swainson's hawk nest survey shall be conducted of all accessible areas within ½ mile of the proposed construction area within 30 days prior to construction activities. If active Swainson's hawk nests are found within ½ mile of a construction site, the applicant shall consult with CDFW and the County. The Project applicant, the Project biologist and the City shall collectively determine the nest avoidance buffer, and what (if any) nest monitoring is necessary. If an active Swainson's hawk nest is found within the Project site prior to construction and is in a tree that is proposed for removal, then the Project applicant shall implement additional mitigation recommended by a qualified biologist based on CDFW guidelines and obtain any required permits from CDFW.

7.8 Swainson's Hawk Foraging Habitat

All areas of suitable Swainson's hawk foraging habitat (agricultural fields and non-native annual grassland) that are converted to another land use (e.g., residential or commercial development, parks, etc.) shall be mitigated through purchase and conservation of similar habitat as follows:

A qualified biologist shall conduct a review of Swainson's hawk nest data available in the CNDDB and contact CDFW to determine if they have any additional nest data. The biologist shall provide the City with a summary of his/her findings. If it is determined that the project site is within 10 miles of an active Swainson's hawk nest, the applicant will mitigate for the loss of suitable Swainson's hawk foraging habitat by implementing one of the below measures:

- Active nest identified within 1 mile of the project site: One acre of suitable foraging habitat shall be protected for each acre of suitable foraging habitat developed. All of the land requirements shall be met by fee title acquisition or a conservation easement (subject to City approval).
- Nest identified within 5 miles (but greater than 1 mile) of the project site: 0.75 acre of suitable foraging habitat shall be protected for each acre of suitable foraging habitat developed. All of the land requirements may be met by fee title acquisition or a conservation easement (subject to City approval).
- Nest identified within 10 miles (but greater than 5 miles) of the project site: 0.5 acre of suitable foraging habitat shall be protected for each acre of suitable foraging habitat developed. All of the land requirements may be met by fee title acquisition or a conservation easement (subject to City approval).

7.9 Roosting Bats

Pre-construction roosting bat surveys shall be conducted by a qualified bat biologist within 14 days prior to any tree removal that will occur during the breeding season (April through August). If pre-construction surveys indicate that no roosts of special-status bats are present, or that roosts are inactive or potential habitat is unoccupied, no further mitigation is required. If roosting bats are found, exclusionary measures approved by the City shall be installed by a qualified bat biologist. Once the bats have been excluded, tree removal may occur. If these actions do not result in exclusion, a qualified biologist in possession of an applicable California Department of Fish and Wildlife Memorandum of Understanding should consult with CDFW to determine appropriate relocation methods.

8.0 REFERENCES

California Burrowing Owl Consortium (CBOC). 1993. *Burrowing Owl Survey Protocol and Mitigation Guidelines*. Dated April 1993.

California Department of Fish and Game (CDFG). 1995. *Staff Report on Burrowing Owl Mitigation*. Dated September 25, 1995.

California Native Plant Society (CNPS). 2017. *Inventory of Rare and Endangered Plants* (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed August 2017].

California Natural Diversity Database (CNDDB). 2017. *RareFind 5*. California Department of Fish and Wildlife. Dated December 1, 2015.

Jennings, M. R., and M.P. Hayes. 1994. *Amphibian and Reptile Species of Special Concern* in Jennings, W.B. (1996). "*Status of amphibians*." Sierra Nevada Ecosystem Project, Final Report to Congress, 2, 921-944.

Jepson Flora Project (eds.) 2017. *Jepson eFlora*, http://ucjeps.berkeley.edu/eflora/ [accessed in August 2017]

LSA Associates, Inc. (LSA). 2008. *Salmonid Habitat Assessment – Solano Habitat Conservation Plan*. Prepared for the Solano County Water Agency. Dated 30 June, 2008.

LSA Associates, Inc. (LSA). 2012. *Solano Habitat Conservation Plan – Public Draft*. Prepared for the Solano County Water Agency. Dated October 2012.

Madrone Ecological Consulting, LLC (Madrone). 2017a. *Draft Special-Status Plant Survey of The Farm at Alamo Creek*. Prepared for D.R. Stephens & Company. Published on 30 August 2017.

Madrone Ecological Consulting, LLC (Madrone). 2017b. *Draft Valley Elderberry Longhorn Beetle Habitat Survey of The Farm at Alamo Creek*. Prepared for D.R. Stephens & Company. Published on 30 August 2017.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation, Second Edition*. California Native Plant Society, Sacramento, CA. 1300 pp.

Shuford, W. D., and Gardali, T., editors. 2008. *California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California*. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (NRCS). 2017. *Web Soil Survey*. Available online at http://websoilsurvey.nrcs.usda.gov/.

Talley, T. 2003. *Identifying the role of spatial, habitat quality and landscape properties in influencing the metapopulation dynamics of a rare, fragmented species*. Thesis proposal, introduction and objectives. 19 January 2003. Department of Environmental Science and Policy, University of California, Davis.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1980. *Listing the Valley Elderberry Longhorn Beetle as a Threatened Species with Critical Habitat. Final Rule*. Federal Register 45(155):52803-52807.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1984. *Valley Elderberry Longhorn Beetle Recovery Plan*. U. S. Fish and Wildlife Service, Portland, Oregon. 62 pp.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1999. *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*. Dated July 9, 1999.

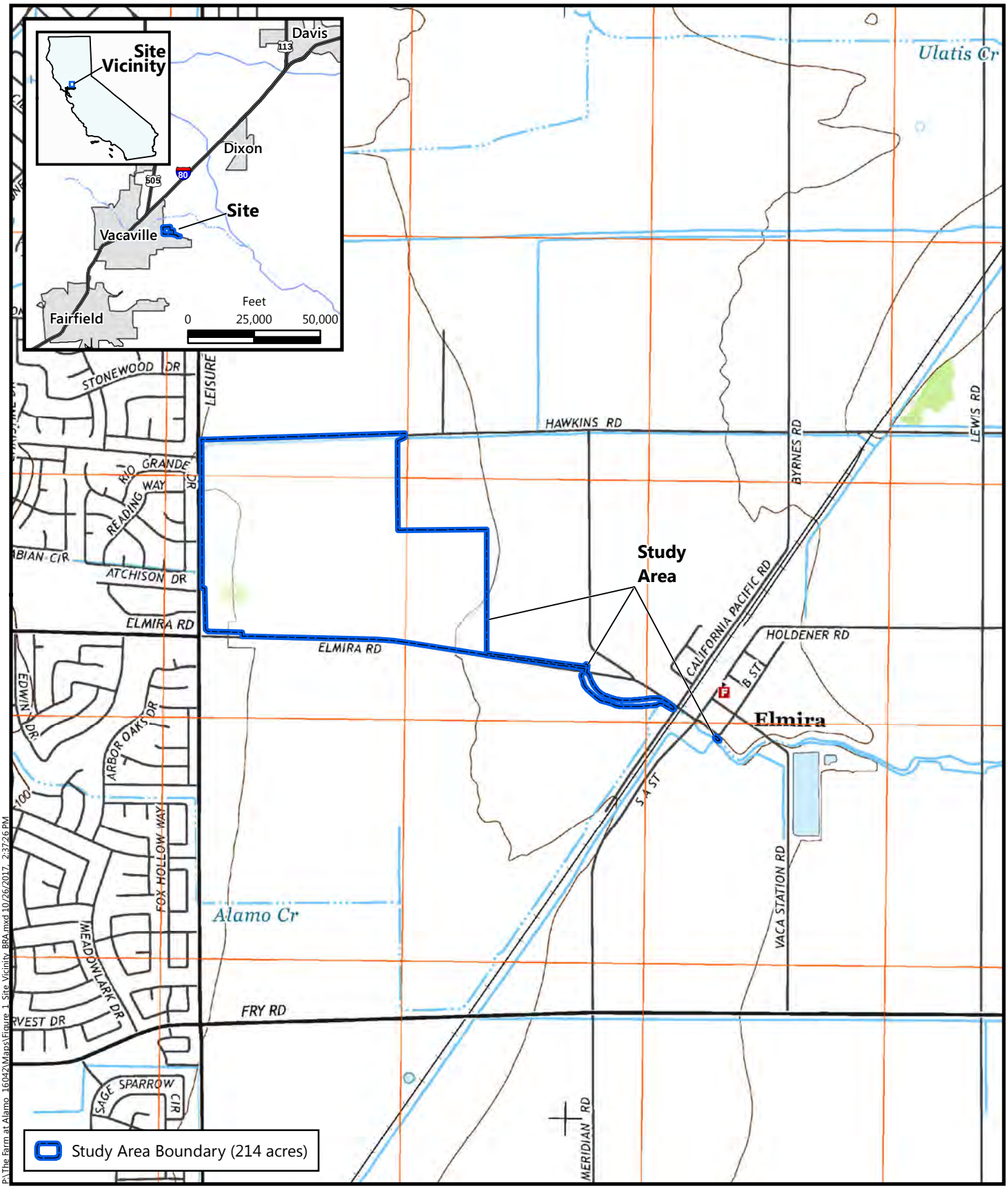
U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2017a. *IPaC Trust Resource Report for the Study Area*. Generated from http://ecos.fws.gov/ipac/ on 21 August 2017.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2017b. *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)*. U.S. Fish and Wildlife Service; Sacramento, California. 28 pp.

U.S. Geological Survey (USGS). 2015. *"Elmira, California"* 7.5-Minute Series Topographic Quadrangle Map. U. S. Geological Survey. Denver, Colorado.

Western Bat Working Group (WBWG). 2017. *Species Matrix and Species Accounts*. Accessed on-line at http://wbwg.org/ in August 2017.

Figures



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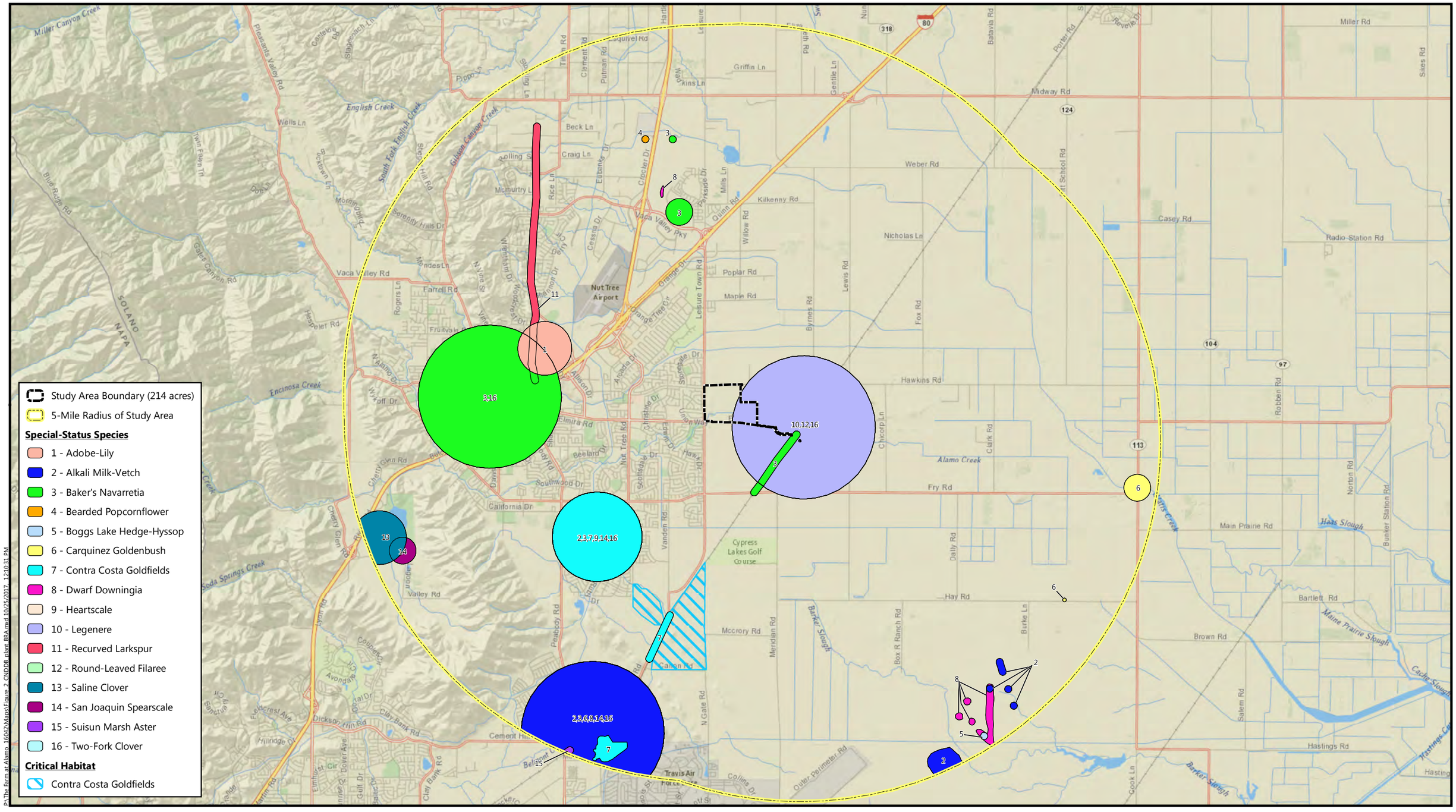
Source: United States Geologic Survey, 2015.
"Elmira, California" 7.5-Minute Topographic Quadrangle
Section 19, Township 6 North, Range 1 East, MDB&M
Section 24, Township 6 North, Range 1 West, MDB&M
Longitude -121.924576, Latitude 38.353867

Figure 1
Site Vicinity

The Farm at Alamo Creek
Solano County, California

MADRONE ECOLOGICAL CONSULTING



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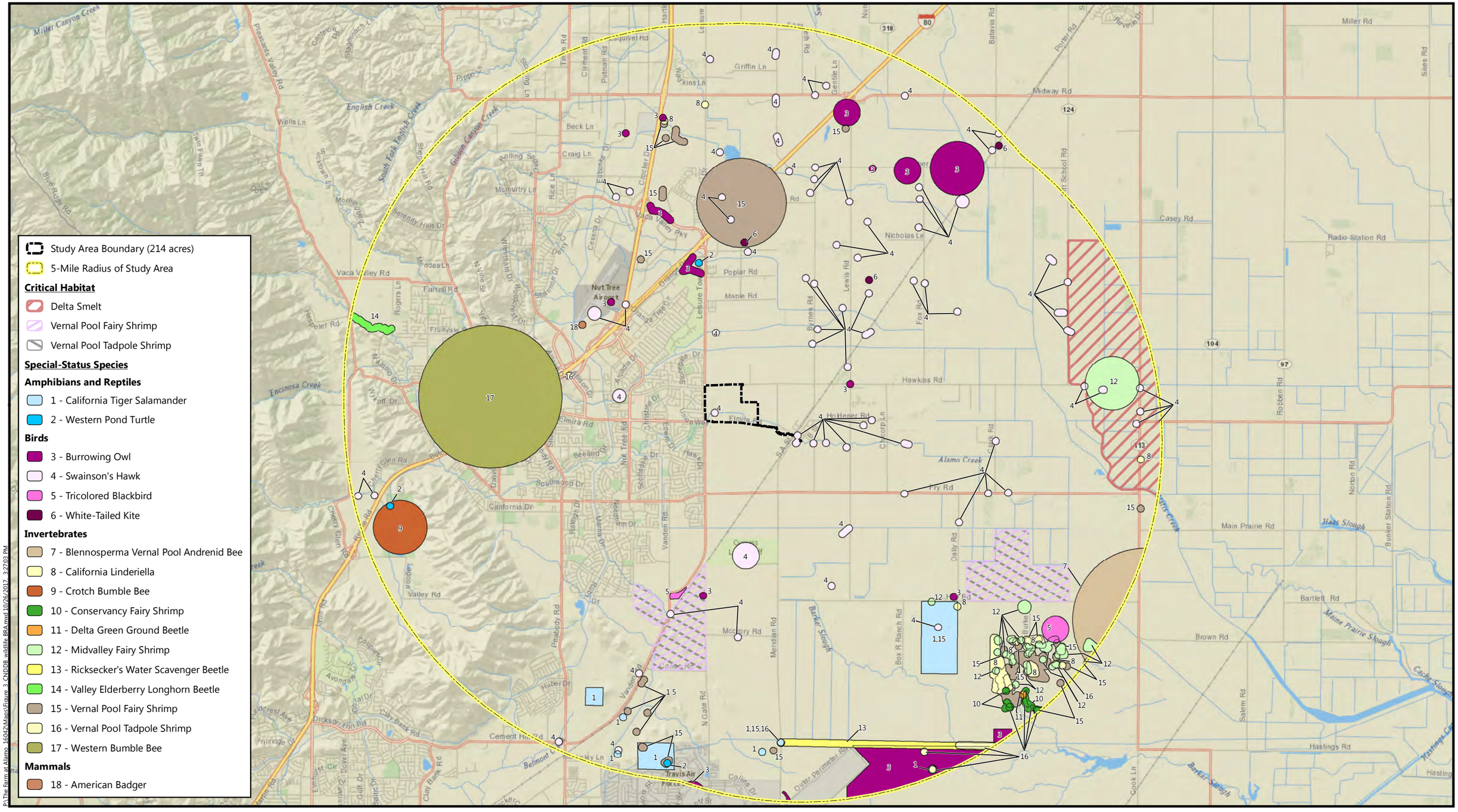
Source: *California Department of Fish and Wildlife*, October 2017.
Basemap Source: *National Geographic and ESRI*

Figure 2
California Natural Diversity Database Occurrences of Plant Species and Critical Habitat

The Farm At Alamo Creek
Solano County, California

MADRONE ECOLOGICAL CONSULTING



P:\The Farm at Alamo_16042\Maps\Figure 3_CNDDB wildlife BRA.mxd 10/26/2017 3:27:03 PM

Source: *California Department of Fish and Wildlife*, October 2017.
Basemap Source: *National Geographic* and *ESRI*

Figure 3
California Natural Diversity Database Occurrences of Wildlife Species and Critical Habitat

The Farm At Alamo Creek
Solano County, California

MADRONE ECOLOGICAL CONSULTING

Figure 4
Aquatic Resources

The Farm At Alamo Creek
Solano County, California

MADRONE ECOLOGICAL CONSULTING

Aerial Source: *USDA, National Agriculture Imagery Program,* 30 May 2016

Soil Survey Source: *USDA, Soil Conservation Service. Soil Survey Geographic (SSURGO) database for Sonoma County, California*
Aerial Source: *USDA, National Agriculture Imagery Program,* 30 May 2016

Figure 5
Natural Resources Conservation Service Soils

The Farm At Alamo Creek
Solano County, California

MADRONE ECOLOGICAL CONSULTING

P:\The Farm at Alamo_16042\Maps\Figure_6_Elderberry_BRA.mxd 10/25/2017, 12:46:20 PM

Figure 6
Elderberry Shrub Location Map

The Farm At Alamo Creek
Solano County, California

Aerial Source: *USDA, National Agriculture Imagery Program,* 30 May 2016

Attachments

Attachment A. Proposed Land Use

Attachment B. IPaC Trust Resource Report for the Study Area

Attachment C. CNPS Inventory of Rare and Endangered Plants Query for the "Elmira, California" USGS Quadrangle and Eight Surrounding Quadrangles

Attachment D. Wildlife Species Observed within the Study Area

Attachment A

Proposed Land Use

VACAVILLE S2 INVESTORS LLC

1 RESIDENTIAL
LOW DENSITY = 10.8± AC

2 RESIDENTIAL
LOW MEDIUM DENSITY = 8.0± AC

3 NEIGHBORHOOD
COMMERCIAL = 4.2± AC

4 RESIDENTIAL
LOW MEDIUM DENSITY = 7.6± AC

5 RESIDENTIAL
LOW MEDIUM DENSITY = 8.0± AC

6 RESIDENTIAL
LOW MEDIUM DENSITY = 7.5± AC

7 RESIDENTIAL
LOW MEDIUM DENSITY = 10.2± AC

8 RESIDENTIAL
LOW DENSITY = 6.9± AC

9 RESIDENTIAL
HIGH DENSITY = 2.8± AC

10 RESIDENTIAL
HIGH DENSITY = 8.9± AC

11 CITY WELL SITE = 1.5± AC

12 (SEE PAPIN PROPERTY)

13 RESIDENTIAL
HIGH DENSITY = 1.4± AC

14 PARK 1 = 4.7± AC

15 PARKS 2 & 3 = 2.5± AC

16 PARK (TRAILS &
CREEK AREA) = 4.4± AC

17 PARK
(PLAY 4 ALL PARK) = 8.2± AC

18 CITY PARK = 11.2± AC

19 PARK
(TRAILS & CREEK AREA) = 4.6± AC

20 DETENTION POND = 12.0± AC

21 PARK
(COMMUNITY GARDENS) = 4.5± AC

22 ARTERIAL
RIGHTS OF WAY = 17.6± AC

23 CARROLL WAY = 8.2± AC

24 RESIDENTIAL
LOW MEDIUM DENSITY = 18.2± AC

25 RESIDE3NTIAL
LOW DENSITY = 38.5± AC

26 PARK = 4.3± AC

PAPIN PROPERTY

12 NEIGHBORHOOD COMMERCIAL = 3.4± AC

TOTAL SITE ACREAGE = 220.1± AC

THE FARM
AT ALAMO CREEK

PROPOSED LAND USE

FIGURE 3.1

03-23-2017

Attachment B

IPaC Trust Resource Report for the Study Area

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Solano County, California

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
California Clapper Rail Rallus longirostris obsoletus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4240	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake Thamnophis gigas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS

Delta Smelt Hypomesus transpacificus — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/321

Steelhead Oncorhynchus (=Salmo) mykiss — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/1007

Insects

NAME	STATUS
Delta Green Ground Beetle Elaphrus viridis There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2319	Threatened
Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp Branchinecta conservatio There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp Branchinecta lynchi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp Lepidurus packardi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Contra Costa Goldfields Lasthenia conjugens There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7058	Endangered
San Joaquin Orcutt Grass Orcuttia inaequalis There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5506	Threatened
Showy Indian Clover Trifolium amoenum No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6459	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

MIGRATORY BIRD INFORMATION IS NOT AVAILABLE AT THIS TIME

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Such measures are particularly important when birds are most likely to occur in the project area. To see when birds are most likely to occur in your project area, view the Probability of Presence Summary. Special attention should be made to look for nests and avoid nest destruction during the breeding season. The best information about when birds are breeding can be found in Birds of North America (BNA) Online under the "Breeding Phenology" section of each species profile. Note that accessing this information may require a subscription. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) that might be affected by activities in your project location. These birds are of priority concern because it has been determined that without additional conservation actions, they are likely to become candidates for listing under the Endangered Species Act (ESA).

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets. The AKN list represents all birds reported to be occurring at some level throughout the year in the counties in which your project lies. That list is then narrowed to only the Birds of Conservation Concern for your project area.

Again, the Migratory Bird Resource list only includes species of particular priority concern, and is not representative of all birds that may occur in your project area. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird entry on your migratory bird species list indicates a breeding season, it is probable the bird breeds in your project's counties at some point within the time-frame specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Facilities

Wildlife refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGES AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Attachment C

CNPS Inventory of Rare and Endangered Plants Query for the "Elmira, California" USGS Quadrangle and Eight Surrounding Quadrangles

CNPS California Native Plant Society

Plant List

Inventory of Rare and Endangered Plants

51 matches found. *Click on scientific name for details*

Search Criteria

California Rare Plant Rank is one of [1A, 1B, 2A, 2B, 3, 4], Found in Quads 3812241, 3812148, 3812147, 3812231, 3812138, 3812137, 3812221 3812128 and 3812127;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Astragalus tener var. ferrisiae	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	1B.1	S1	G2T1
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S2	G2T2
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex coronata var. coronata	crownscale	Chenopodiaceae	annual herb	Mar-Oct	4.2	S3	G4T3
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	annual herb	Jun,Aug,Sep,Oct	1B.2	S2	G2
California macrophylla	round-leaved filaree	Geraniaceae	annual herb	Mar-May	1B.2	S3?	G3?
Calochortus pulchellus	Mt. Diablo fairy-lantern	Liliaceae	perennial bulbiferous herb	Apr-Jun	1B.2	S2	G2
Centromadia parryi ssp. congdonii	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	1B.1	S2	G3T2
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	annual herb	May-Nov	1B.2	S2	G3T2
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Chloropyron molle ssp. hispidum	hispid bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Sep	1B.1	S1	G2T1
Chloropyron molle ssp. molle	soft bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Nov	1B.2	S1	G2T1
Cicuta maculata var. bolanderi	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	2B.1	S2	G5T4
Cirsium hydrophilum var. hydrophilum	Suisun thistle	Asteraceae	perennial herb	Jun-Sep	1B.1	S1	G2T1
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Eriogonum truncatum	Mt. Diablo buckwheat	Polygonaceae	annual herb	Apr-Sep(Nov-Dec)	1B.1	S2	G2

Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2	G2
Fritillaria pluriflora	adobe-lily	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2S3	G2G3
Gilia capitata ssp. tomentosa	woolly-headed gilia	Polemoniaceae	annual herb	May-Jul	1B.1	S1	G5T1
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	1B.2	S2	G2
Hesperolinon breweri	Brewer's western flax	Linaceae	annual herb	May-Jul	1B.2	S2?	G2?
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Isocoma arguta	Carquinez goldenbush	Asteraceae	perennial shrub	Aug-Dec	1B.1	S1	G1
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	annual herb	Mar-Jun	1B.1	S1	G1
Lasthenia ferrisiae	Ferris' goldfields	Asteraceae	annual herb	Feb-May	4.2	S3	G3
Lathyrus jepsonii var. jepsonii	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	1B.2	S2	G5T2
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	1B.1	S2	G2
Lepidium latipes var. heckardii	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	1B.2	S1	G4T1
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	annual herb	Jun-Oct	3	S3?	G3?
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	1B.1	S2	G2
Limosella australis	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	2B.1	S2	G4G5
Microseris paludosa	marsh microseris	Asteraceae	perennial herb	Apr-Jun(Jul)	1B.2	S2	G2
Myosurus minimus ssp. apus	little mousetail	Ranunculaceae	annual herb	Mar-Jun	3.1	S2	G5T2Q
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G4T2
Neostapfia colusana	Colusa grass	Poaceae	annual herb	May-Aug	1B.1	S1	G1
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Poaceae	annual herb	Apr-Sep	1B.1	S1	G1
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	Apiaceae	perennial herb	Jun-Oct	4.2	S4	G5T4
Plagiobothrys hystriculus	bearded popcornflower	Boraginaceae	annual herb	Apr-May	1B.1	S2	G2
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)	Feb-May	4.2	S3	G4
Sidalcea keckii	Keck's checkerbloom	Malvaceae	annual herb	Apr-May(Jun)	1B.1	S2	G2
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	Caryophyllaceae	perennial herb	Feb-May	1B.2	S2	G5T2

Stuckenia filiformis ssp. alpina	slender-leaved pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	May-Jul	2B.2	S3	G5T5
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2
Trifolium amoenum	two-fork clover	Fabaceae	annual herb	Apr-Jun	1B.1	S1	G1
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2
Tuctoria mucronata	Crampton's tuctoria or Solano grass	Poaceae	annual herb	Apr-Aug	1B.1	S1	G1
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	May-Jun	2B.3	S3?	G4G5

Suggested Citation

California Native Plant Society, Rare Plant Program. 2017. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 21 August 2017].

Attachment D

Wildlife Species Observed within the Study Area

Wildlife Species Observed within
The Farm at Alamo Creek Study Area
16 November 2016, 6 July 2017, 17 August 2017, and 19 October 2017

Species Name	Common name
Birds	
Meleagris gallopavo	Turkey
Ardea alba	Great egret
Cathartes aura	Turkey vulture
Circus cyaneus	Northern harrier
Buteo jamaicensis	Red-tailed hawk
Buteo lineatus	Red-shouldered hawk
Buteo swainsoni	Swainson's hawk
Falco sparverius	American kestrel
Zenaida macroura	Mourning dove
Tyto alba	Barn owl
Bubo virginianus	Great horned owl
Megaceryle alcyon	Belted kingfisher
Colaptes auratus	Northern flicker
Calypte anna	Anna's hummingbird
Sayornis nigricans	Black phoebe
Aphelocoma californica	Western scrub jay
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Psaltriparus minimus	Bushtit
Thryomanes bewickii	Bewick's wren
Regulus calendula	Ruby-crowned kinglet
Sialia mexicana	Western bluebird
Pipilo maculatus	Spotted towhee
Melozone crissalis	California towhee
Passerculus sandwichensis	Savannah sparrow
Zonotrichia leucophrys	White-crowned sparrow
Reptiles	
Sceloporus occidentalis	Western fence lizard
Mammals	
Otospermophilus beecheyi	California ground-squirrel

DRAFT

Special-Status Plant Survey Report

The Farm at Alamo Creek

Solano County, California

October 2017

MADRONE ECOLOGICAL CONSULTING

Prepared for:
D.R. Stephens & Company
465 California St., Suite 330
San Francisco, California 94104

Recommended Citation:
Madrone Ecological Consulting, LLC (Madrone). 2017. *Draft Special-Status Plant Survey Report for The Farm at Alamo Creek*. Prepared for D.R. Stephens & Company. Published on 26 October 2017.

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1.0 INTRODUCTION

This report presents the results of a special-status plant survey conducted for The Farm at Alamo Creek Property and associated off-site areas (Study Area). The approximately 214-acre Study Area is located south of Hawkins Road, east of Leisure Town Road, and both north and south of Elmira Road in Solano County, California. The site is located within a portion of Section 19, Township 6 North, Range 1 East, and a portion of Section 24, Township 6 North, Range 1 West (MDB&M) of the "Elmira, California" 7.5·minute quadrangle (USGS 2015) (**Figure 1**).

2.0 METHODOLOGY

Madrone Ecological Consulting, LLC (Madrone) biologists Matt Hirkala and Daria Snider conducted special-status plant surveys of the Study Area on 12 May, 6 July, and 17 August 2017. The off-site areas were surveyed on 19 October 2017, and determined to lack habitat for any special-status plant species. The special-status plant surveys were conducted in accordance with the U.S. Fish and Wildlife Service's *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996), California Department of Fish and Wildlife's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009), and the *CNPS Botanical Survey Guidelines* (CNPS 2001).

A list of special-status plant species with potential to occur within the Study Area was developed by reviewing the following literature, and then refining the list based on habitats present within the Study Area:

- California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (CNPS 2017) query of CRPR Lists 1A, 1B, 2A, 2B, and 3 within the "Elmira, California" USGS topo quadrangle and eight surrounding quadrangles;
- USFWS Information for Planning and Conservation (IPaC) (USFWS 2017) query for the Study Area; and
- the California Natural Diversity Database occurrences of special-status plant species within 5 miles of the Study Area (CNDDB 2017) (**Figure 2**).

The target species for this survey were:

- Dwarf downingia (*Downingia pusilla*);
- Contra Costa goldfields (*Lasthenia conjugens*);
- Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*); and
- Bearded popcorn flower (*Plagiobothrys hystriculus*).

Meandering pedestrian surveys were conducted throughout all portions of the Study Area that contained natural habitat (i.e., all areas but the actively managed agricultural fields). The surveys were floristic in nature, which means that all plant species observed on-site were identified to the taxonomic level necessary to determine rarity. Thus, if a special-status plant was present but not on the target list, it would have been detected and documented. Plant taxonomy was based on the nomenclature in the *Jepson eFlora* (Jepson Flora Project 2017). Vegetation communities were classified according to the *Manual of California*

Vegetation, Second Edition (Sawyer et al. 2009). Qualifications for the biologists that conducted the surveys are included in Attachment A, a list of reference populations of target plants visited is included in Attachment B, and a comprehensive list of all plant species observed during surveys of the Study Area is included in Attachment C.

3.0 EXISTING SITE CONDITIONS

The Study Area is largely comprised of agricultural fields and Old Alamo Creek, with its associated Valley oak (*Quercus lobata*) riparian corridor. The agricultural fields were planted primarily in alfalfa (*Medicago sativa*) during the field visits. A few irrigation canals that convey water to and from the agricultural fields run through the portion of the Study Area north of Old Alamo Creek. A narrow strip of regularly-mowed non-native annual grassland occurs along the southern edge of a large portion of the Study Area, just north of Elmira Road. A small mesic area runs between Old Alamo Creek and what appears to be a stormdrain drop inlet within this annual grassland strip. A residential property is present in the southwestern corner of the Study Area; this area has a number of buildings, scattered large Valley oak trees, and ornamental vegetation, but is otherwise largely unvegetated. Ruderal vegetation occurs in small patches, scattered throughout the Study Area, mostly on field edges, adjacent to portions of the irrigation canal, or between the riparian corridor and roadways.

Surrounding lands to the north, east and south are largely similarly agricultural with scattered rural residences, although a portion of the Study Area extends into and is surrounded by the rural community of Elmira. Properties to the west are developed. The Study Area is very flat, and slopes very slightly from west to east. Elevations range from 94 feet above mean sea level in the southwestern corner to approximately 70 feet at the eastern end, along Old Alamo Creek.

3.1 Terrestrial Vegetation Communities

3.1.1 Non-Native Annual Grassland

A narrow strip of non-native annual grassland occurs to the north of Elmira Road. This strip appears to be both the road right-of-way and a sewer or storm drain maintenance easement. As such, it was mowed during all of our field visits, and the dominant grasses were unidentifiable. However, it is assumed to be dominated by common annual grassland species in the area, such as soft brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), perennial ryegrass (*Festuca perennis*), and wild oats (*Avena fatua*). Forbs observed intermittently in this area include yellow star-thistle (*Centaurea solstitialis*), prickly wild lettuce (*Lactuca serriola*), and wild radish (*Raphanus sativus*). A mesic inclusion in this strip is occupied by different plant species, including slender wheatgrass (*Elymus trachycaulus*), sorghum (*Sorghum halepense*), prickly sow-thistle (*Helminthotheca echioides*), Bermuda grass (*Cynodon dactylon*), alkali mallow (*Malvella leprosa*), curly dock (*Rumex crispus*), spring vetch (*Vicia sativa*), and chicory (*Cichorium intybus*).

3.1.2 Valley Oak Riparian Woodland

A well-developed Valley oak (*Quercus lobata*) riparian woodland occurs along both sides of Old Alamo Creek for most of its length through the Study Area. Within the Study Area, this community is relatively diverse. Dominant tree species include Valley oak, Fremont's cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), red willow (*S. laevigata*), English walnut (*Juglans regia*), and black walnut (*Juglans hindsii*). Dominant shrubs in the understory include Himalayan blackberry (*Rubus armeniacus*), wild rose (*Rosa californica*), and sandbar willow (*Salix exigua*). Santa Barbara sedge (*Carex barbarae*) beds occupy large areas in the understory of this community, in between the Himalayan blackberry and the wild rose. The dense cover of these species leaves very little remaining space in the understory for other herbaceous vegetation. Other plant species observed relatively frequently in this community include cultivated almond (*Prunus dulcis*), olive (*Olea europaea*), blue elderberry (*Sambucus nigra* ssp. *cerulea*), tree of heaven (*Ailanthus altissima*), California bay laurel (*Umbellularia californica*), and eucalyptus (*Eucalyptus* species).

The portion of Old Alamo Creek south of Elmira Road supports a much more dense Valley oak riparian woodland. Although the large, overstory trees are consistent with the description above, the channel itself has been rendered virtually inaccessible due to an extremely tall, dense thicket of Himalayan blackberry, and in areas along the northern edge of the creek, a dense sandbar willow thicket.

3.1.3 Ruderal

Ruderal vegetation occurs in small patches throughout the Study Area. This community is comprised largely of non-native forbs, but some grasses are also present. Plant species commonly observed in this community within the Study Area include wild radish, velvet leaf (*Abutilon theophrasti*), tomatillo (*Physalis philadelphica*), lambs quarters (*Chenopodium album*), bull mallow (*Malva nicaeensis*), prickly sow thistle, sorghum, wild oats, winter vetch (*Vicia villosa*), jungle rice (*Echinochloa colona*), chickweed (*Stellaria media*), henbit (*Lamium amplexicaule*), alkali mallow, sweet fennel (*Foeniculum vulgare*), and poison hemlock (*Conium maculatum*).

3.2 Aquatic Resources

3.2.1 Old Alamo Creek

Old Alamo Creek is an intermittent drainage that runs through the southern portion of the Study Area, and is bordered on both sides by a well-developed Valley oak woodland. In the central portion of the Study Area, this feature straightens out, and is bordered only by herbaceous vegetation. In the eastern portion of the Study Area, the channel of the creek is almost entirely obscured by Himalayan blackberry. Although some deeper portions of the creek appear to pond water perennially in stagnant pools, much of the creek through the Study Area dries out during the summer. The creek is quite broad through the woodland areas, ranging from 20-30 feet or more in width. In the central reach, it narrows down to just 10 feet wide.

3.2.2 Irrigation Canal

The Irrigation Canals that run through the Study Area convey water from the Solano Irrigation District's (SID's) Putah South Canal to agricultural fields both on-site and off-site. Portions of these canals are concrete-lined, while other portions are well-maintained dirt-lined canals. As such, there is little to no vegetation within or on the banks of these features.

3.2.3 Irrigation Ditch

Irrigation Ditches in the southern portion of the Study Area appear to drain irrigation water from the southern agricultural fields into Old Alamo Creek. These features are much smaller than the irrigation canals, and although they are unvegetated within the channel, the banks are densely vegetated with weedy facultative species such as curly dock, sorghum, and prickly cocklebur.

3.2.4 Roadside Ditch

A roadside ditch is present along the northern border of the Study Area, just south of Hawkins Road. The roadside ditch collects runoff from Hawkins Road, and conveys it east through a series of off-site ditches into Ulatis Creek. This feature is primarily unvegetated due to ditch maintenance, but some ruderal vegetation has become established in portions. Plant species observed in and adjacent to this feature include pigweed amaranth (*Amaranthus albus*), wild radish, tall nutsedge, dallisgrass, and wild carrot (*Daucus carota*).

3.3 Soils

The Natural Resources Conservation Service has mapped five soil units within the Study Area; (BrA) Brentwood clay loam, 0 to 2% slopes; (Ca) Capay silty clay loam; (RoA) Rincon clay loam, 0 to 2% slopes; (Yo) Yolo loam; and (Yr) Yolo loam, clay substratum (NRCS 2017). None of these soils are considered more than very slightly alkaline in the surface layers, and none of them have serpentine parent materials (NRCS 2017).

4.0 SURVEY RESULTS

4.1 Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is not federally or state listed, but it is classified as a CRPR List 1B.2 plant. It is a diminutive annual herb that is strongly associated with vernal pools and other seasonally inundated features at elevations ranging from sea level to approximately 1,500 feet (CNPS 2017). Dwarf downingia is typically associated with areas that experience a moderate degree of disturbance, and it blooms from March to May.

The mesic area just north of Elmira Road represents marginally suitable habitat for this species. Field surveys conducted by a botanist during the blooming season failed to detect this species.

4.2 Contra Costa Goldfields

Contra Costa goldfields (*Lasthenia conjugens*) is federally endangered and a CRPR List 1B.1 plant. Contra Costa goldfields is found in vernal pools, alkaline playas, and other mesic areas in cismontane woodland and valley and foothill grasslands at elevations between sea level and 1,540 feet (CNPS 2017). This annual herb blooms from March through June (CNPS 2017).

The mesic area just north of Elmira Road represents marginally suitable habitat for this species. Field surveys conducted by a botanist during the blooming season failed to detect this species.

4.3 Baker's Navarretia

Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*) is not federally or state listed, but it is classified as a CRPR List 1B.1 plant. Baker's navarretia is found in vernal pools and other mesic areas in cismontane woodland, lower montane coniferous forest, and valley and foothill grasslands at elevations between 15 and 5,700 feet (CNPS 2017). This annual herb blooms from April through July (CNPS 2017).

The mesic area just north of Elmira Road represents marginally suitable habitat for this species. Field surveys conducted by a botanist during the blooming season failed to detect this species. CNDDB Occurrence 33 of this species occurs within the Study Area (CDFW 2017). The exact location of this occurrence is unknown, and it was last documented in 1962 (CDFW 2017). No suitable habitat occurs within the portion of the Study Area that intersects this occurrence.

4.4 Bearded Popcorn Flower

Bearded popcorn flower (*Plagiobothrys hystriculus*) is not federally or state listed, but it is classified as a CRPR List 1B.1 plant. Bearded popcorn flower is found in vernal swales and along the upper edges of vernal pools at elevations between sea level and 900 feet (CNPS 2017). This annual herb blooms from April through May (CNPS 2017).

The mesic area just north of Elmira Road represents marginally suitable habitat for this species. Field surveys conducted by a botanist during the blooming season failed to detect this species.

5.0 CONCLUSION

No special-status plant species were observed during the 2017 protocol-level special-status plant surveys of The Farm at Alamo Creek Property.

6.0 REFERENCES

California Department of Fish and Wildlife (CDFG). 2009. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Dated November 24, 2009.

California Native Plant Society (CNPS). 2001. *CNPS botanical survey guidelines*. Pages 38-40 *in* California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (D.P. Tibor, editor). Sixth edition. Special Publication No. 1, California Native Plant Society, Sacramento, 387 pp.

California Native Plant Society (CNPS). 2017. *Inventory of Rare and Endangered Plants* (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed March through August 2017].

Jepson Flora Project (eds.) 2017. *Jepson eFlora*, http://ucjeps.berkeley.edu/eflora/ [accessed August 2017]

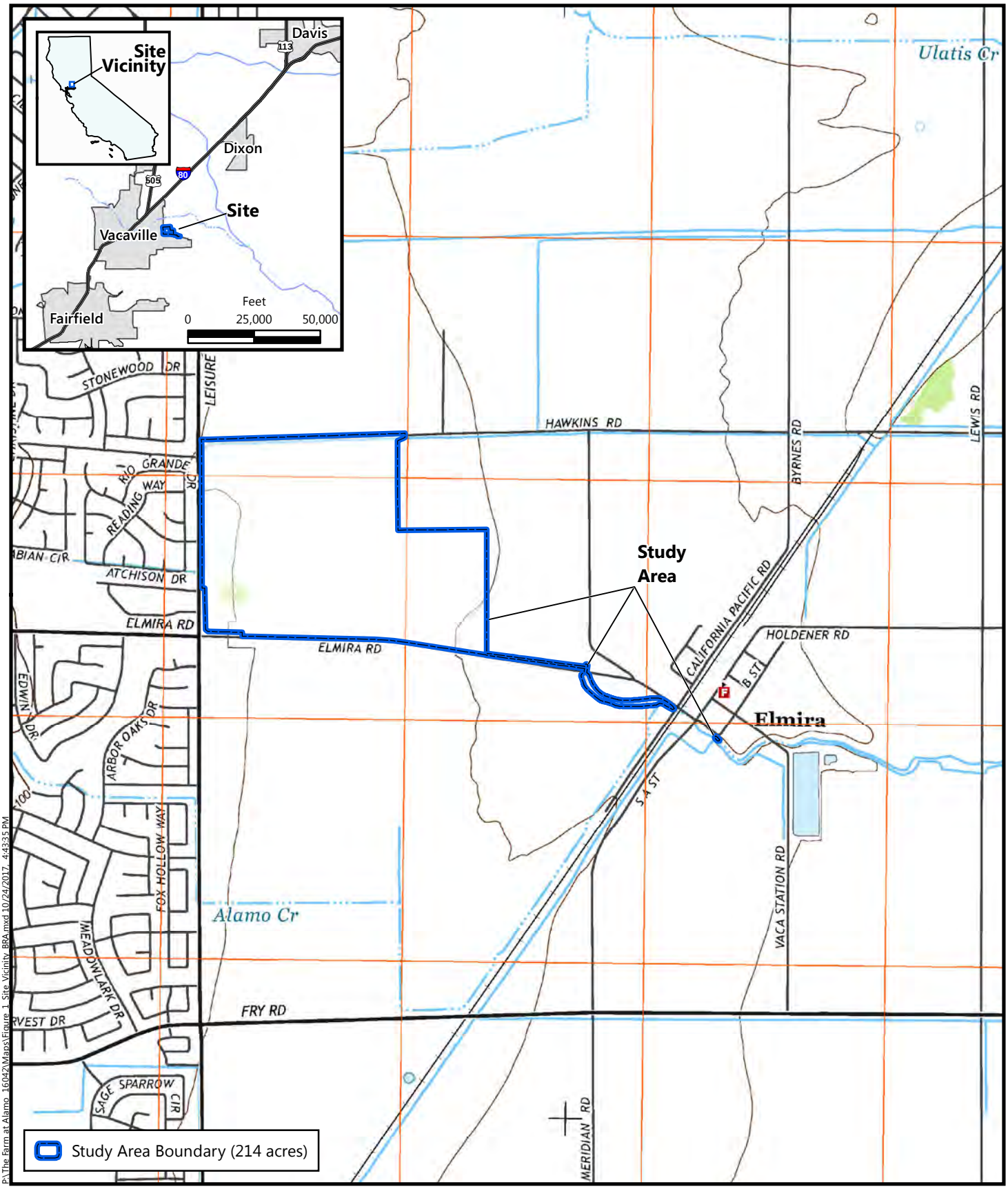
Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation, Second Edition*. California Native Plant Society, Sacramento, CA. 1300 pp.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (NRCS). 2017. *Web Soil Survey*. Available online at http://websoilsurvey.nrcs.usda.gov/.

U.S. Geological Survey (USGS). 2015. *"Elmira, California"* 7.5-Minute Series Topographic Quadrangle. U. S. Geological Survey. Denver, Colorado.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1996. *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants*. Sacramento, CA.

Figures



P:\The Farm at Alamo_16042\Maps\Figure 1_Site_Vicinity_BRA.mxd 10/24/2017 4:43:35 PM

Source: United States Geologic Survey, 2015.
"Elmira, California" 7.5-Minute Topographic Quadrangle
Section 19, Township 6 North, Range 1 East, MDB&M
Section 24, Township 6 North, Range 1 West, MDB&M
Longitude -121.924576, Latitude 38.353867

Figure 1
Site Vicinity

The Farm at Alamo Creek
Solano County, California

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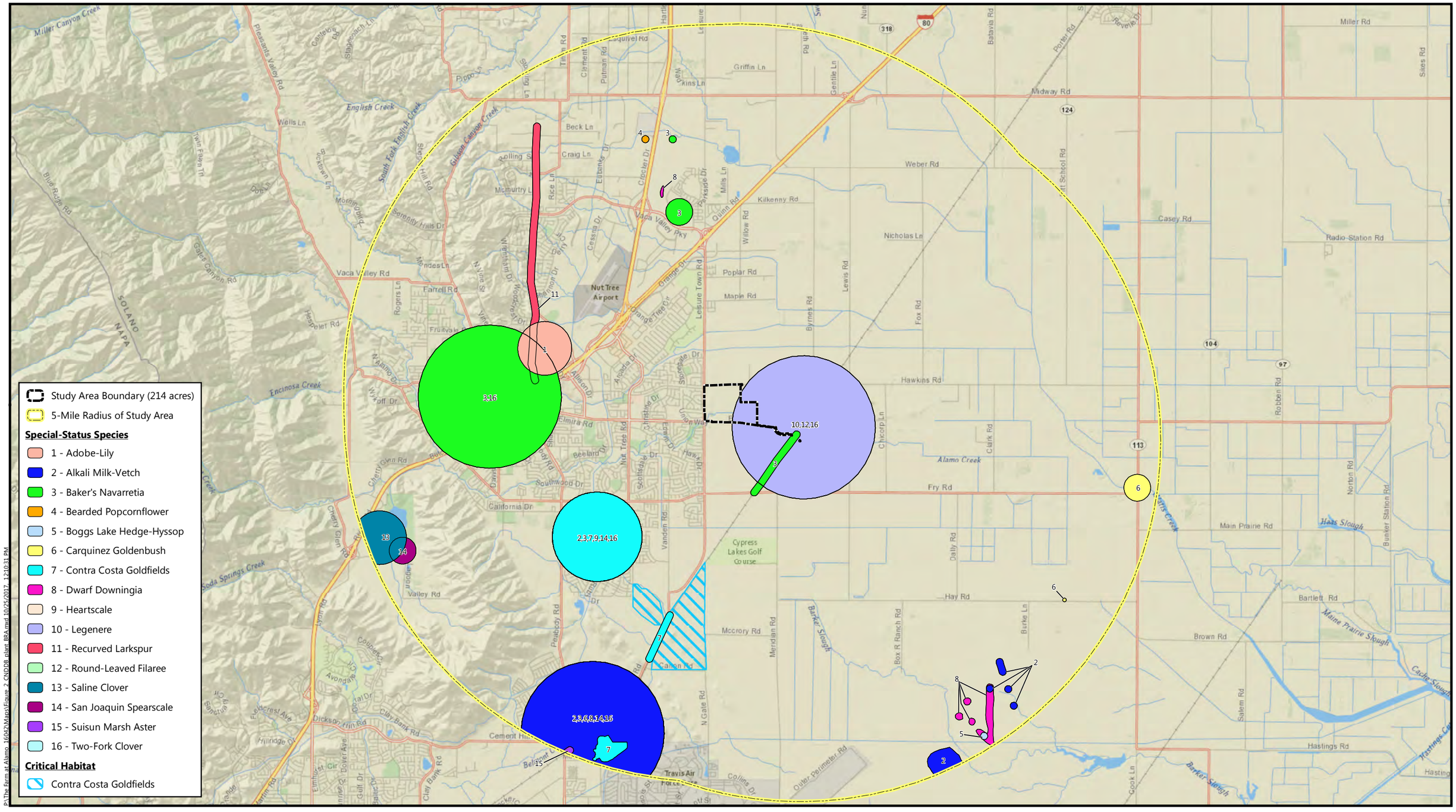

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Source: *California Department of Fish and Wildlife*, October 2017.
Basemap Source: *National Geographic and ESRI*

P:\The Farm at Alamo_16042\Maps\Figure 2_CNDDB_plant_BRA.mxd 10/25/2017 12:10:31 PM

Figure 2
California Natural Diversity Database Occurrences of Plant Species and Critical Habitat

The Farm At Alamo Creek
Solano County, California

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Attachments

Attachment A: Botanist Qualifications

Attachment B: Target Plant Species Reference Population Information

Attachment C: Plant Species Observed within The Farm at Alamo Creek Study Area

Attachment A

Botanist Qualifications

Rare Plant Survey Botanist Qualifications

Daria Snider

Ms. Snider has more than 13 years of experience conducting botanical inventories. As a senior biologist, she specializes in rare plant surveys, wetland delineations, and general biological resource inventories. In addition to rare plant surveys, her botanical experience includes general vegetation surveys, aerial and field vegetation mapping, Certified Arborist tree inventories, CRAM Assessments, floristic monitoring, and invasive species identification and mapping. Ms. Snider's experience includes a wide variety of habitat types, including vernal pools, annual grasslands, oak woodland, riparian communities, coastal sage scrub, chaparral, cismontane and montane forests, and desert. Her geographic expertise covers much of California, from Shasta County in the north to the Mojave Desert and San Gabriel Mountains in the south, and from Napa County in the west to the Sierra Nevada foothills and mountains in the east. Her primary focus is on the Sacramento Valley and the adjacent Sierra Nevada foothills.

Matthew Hirkala

Mr. Hirkala has over 15 years of botanical experience, including rare plant surveys, wetland delineations, mitigation monitoring, and CRAM Assessments. Mr. Hirkala has conducted floristic inventories in a wide variety of habitat types, including vernal pool complexes, annual grasslands, scrub shrub, oak woodlands, riparian corridors, chaparral, and cismontane and montane forests. Though his primary focus is within the Sacramento Valley and the adjacent Sierra Nevada foothills, Mr. Hirkala's geographical experience extends from Shasta County in the north to Kern County in the south and from Napa County in the west to the Sierra Nevada mountains in the east.

Attachment B

Target Plant Species Reference Population Information

Target Plant Species Reference Population Information for The Farm at Alamo Creek Rare Plant Survey

Plant Species	Location of Reference Population	Date of Visit	Phenology of Reference Population/ Distinctive Characteristics
Downingia pusilla Dwarf downingia	Seasonal wetland swale south of western Pleasant Grove Blvd in Roseville, CA	3 May 2017	Relatively few plants due to high thatch cover, but those that are present are approximately half in bloom and half in bud. Very small plants with diminutive white star-shaped flower.
Lasthenia conjugens Contra Costa goldfields	CNDDB Occurrence 24 - Vernal pool fringes and adjacent mesic grasslands north of Markeley Lane just north of Travis AFB and east of Fairfield.	29 April 2015	Robust population; approximately 95% of plants were in bloom, and 5% were in bud. Many *Lasthenia* species appear superficially similar. *L. conjugens* differs from the most similar *L. glabrata* by having hairy phyllaries that are fused for less than ½ of their length. *L. glabrata* has glabrous phyllaries that are fused for more than 2/3 of their length.
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	Herbarium specimen at UC Davis Center for Plant Diversity	20 April 2017	Pressed specimen. Corolla tube is included in the calyx, and corolla lobes are linear. This is in comparison to the exerted corolla tube and ovate corolla lobes of the more common subspecies *Navarretia leucocephala* ssp. *leucocephala*.
Plagiobothrys hystriculus Bearded popcorn flower	Herbarium specimen at UC Davis Center for Plant Diversity	20 April 2017	Pressed specimen. Appears very similar to the relatively common *Plagiobothrys greenei*, but the nutlets are smaller, and have blunt-tipped tubercles instead of slender prickles.

Attachment C

Plant Species Observed within
The Farm at Alamo Creek Study Area

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Plant Species Observed within The Farm at Alamo Creek Study Area
12 May and 18 July 2017

Family / Species Name	Common name	Native / Non-Native
ADOXACEAE		
Sambucus nigra subsp. *caerulea*	Blue elderberry	Native
AMARANTHACEAE		
Amaranthus albus	Tumbleweed	Non-native
Amaranthus blitoides	Procumbent pigweed	Native
ANACARDIACEAE		
Toxicodendron diversilobum	Western poison oak	Native
APIACEAE		
Conium maculatum	Poison hemlock	Non-native
Foeniculum vulgare	Fennel	Non-native
APOCYNACEAE		
Asclepias fascicularis	Narrow-leaf milkweed	Native
ARECACEAE		
Phoenix canariensis	Canary island palm	Non-native
ASTERACEAE		
Artemisia douglasiana	Mugwort	Native
Bidens frondosa	Sticktight	Native
Carduus pycnocephalus subsp. *pycnocephalus*	Italian thistle	Non-native
Cichorium intybus	Chicory	Non-native
Cirsium vulgare	Bull thistle	Non-native
Erigeron canadensis	Horseweed	Native
Helminthotheca echioides	Bristly ox-tongue	Non-native
Lactuca serriola	Prickly lettuce	Non-native
Silybum marianum	Milk thistle	Non-native
Tragopogon porrifolius	Salsify	Non-native
Xanthium strumarium	Cocklebur	Native
BRASSICACEAE		
Brassica nigra	Black mustard	Non-native
Brassica rapa	Field mustard	Non-native
Hirschfeldia incana	Tumble mustard	Non-native
Raphanus sativus	Radish	Non-native

Plant Species Observed within The Farm at Alamo Creek Study Area
12 May and 18 July 2017

Family / Species Name	Common name	Native / Non-Native
CACTACEAE		
Opuntia ficus-indica	Mission prickly-pear	Non-native
CARYOPHYLLACEAE		
Stellaria media	Common chickweed	Non-native
CHENOPODIACEAE		
Chenopodium album	Lamb's quarters	Non-native
CONVOLVULACEAE		
Convolvulus arvensis	Bindweed	Non-native
CYPERACEAE		
Carex barbarae	Santa barbara sedge	Native
Cyperus eragrostis	Tall nutsedge	Native
FABACEAE		
Medicago sativa	Alfalfa	Non-native
Vicia sativa subsp. *sativa*	Spring vetch	Non-native
Vicia villosa subsp. *villosa*	Winter vetch	Non-native
FAGACEAE		
Quercus chrysolepis	Canyon live oak	Native
Quercus lobata	Valley oak	Native
GERANIACEAE		
Erodium cicutarium	Redstem filaree	Non-native
Geranium dissectum	Cut leaf geranium	Non-native
JUGLANDACEAE		
Juglans hindsii x regia	Hybrid walnut	Non-native
Juglans regia	English walnut	Non-native
LAMIACEAE		
Lamium amplexicaule	Henbit	Non-native
LAURACEAE		
Umbellularia californica	California bay	Native

Plant Species Observed within The Farm at Alamo Creek Study Area
12 May and 18 July 2017

Family / Species Name	Common name	Native / Non-Native
MALVACEAE		
Abutilon theophrasti	Velvet-leaf	Non-native
Malva nicaeensis	Bull mallow	Non-native
Malvella leprosa	Alkali-mallow	Native
MORACEAE		
Ficus carica	Edible fig	Non-native
MYRTACEAE		
Eucalyptus camaldulensis	Red gum, river red gum	Non-native
OLEACEAE		
Olea europaea	Cultivated olive	Non-native
ONAGRACEAE		
Epilobium brachycarpum	Panicled willow-herb	Native
PLANTAGINACEAE		
Plantago lanceolata	English plantain	Non-native
POACEAE		
Avena fatua	Wild oat	Non-native
Bromus diandrus	Ripgut grass	Non-native
Bromus hordeaceus	Soft chess	Non-native
Cynodon dactylon	Bermuda grass	Non-native
Echinochloa colona	Jungle rice	Non-native
Elymus trachycaulus subsp. *trachycaulus*	Slender wheat grass	Native
Festuca perennis	Rye grass	Non-native
Leptochloa fusca subsp. *fascicularis*	Bearded sprangletop	Native
Panicum capillare	Witch grass	Native
Paspalum dilatatum	Dallis grass	Non-native
Phalaris paradoxa	Hood canary grass	Non-native
Polypogon monspeliensis	Annual rabbitfoot grass	Non-native
Sorghum halepense	Johnson grass	Non-native
Stipa miliacea var. *miliacea*	Smilo grass	Non-native
POLYGONACEAE		
Persicaria maculosa	Lady's thumb	Non-native

Plant Species Observed within The Farm at Alamo Creek Study Area
12 May and 18 July 2017

Family / Species Name	Common name	Native / Non-Native
Polygonum aviculare subsp. *depressum*	Prostrate knotweed	Non-native
Rumex crispus	Curly dock	Non-native
PORTULACACEAE		
Portulaca oleracea	Purslane	Non-native
ROSACEAE		
Prunus dulcis	Almond	Non-native
Rosa californica	California rose	Native
Rubus armeniacus	Himalayan blackberry	Non-native
RUBIACEAE		
Galium aparine	Goose grass	Native
SALICACEAE		
Populus fremontii subsp. *fremontii*	Fremont cottonwood	Native
Salix exigua var. *exigua*	Sandbar willow	Native
Salix gooddingii	Goodding's black willow	Native
Salix laevigata	Red willow	Native
Salix lasiolepis	Arroyo willow	Native
SIMAROUBACEAE		
Ailanthus altissima	Tree of heaven	Non-native
SOLANACEAE		
Physalis philadelphica	Tomatillo	Non-native
Solanum americanum	White nightshade	Native
ZYGOPHYLLACEAE		
Tribulus terrestris	Puncture vine	Non-native

DRAFT

Valley Elderberry Longhorn Beetle Habitat Survey Report

The Farm at Alamo Creek

Solano County, California

October 2017

MADRONE ECOLOGICAL CONSULTING

Prepared for:
D.R. Stephens & Company
465 California St., Suite 330
San Francisco, California 94104

Recommended Citation:
Madrone Ecological Consulting, LLC (Madrone). 2017. *Valley Elderberry Longhorn Beetle Habitat Survey Report for The Farm at Alamo Creek*. Prepared for D.R. Stephens & Company. Published on 26 October 2017.

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1.0 INTRODUCTION

This report presents the results of a protocol-level Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*, VELB) habitat survey conducted for The Farm at Alamo Creek Property and associated off-site areas (Study Area). The approximately 214-acre Study Area is located south of Hawkins Road, east of Leisure Town Road, and both north and south of Elmira Road in Solano County, California. The site is located within a portion of Section 19, Township 6 North, Range 1 East, and a portion of Section 24, Township 6 North, Range 1 West (MDB&M) of the "Elmira, California" 7.5·minute quadrangle (USGS 2015) (**Figure 1**).

2.0 SPECIES ACCOUNT

The VELB is federally listed as threatened. Critical habitat was designated by the USFWS on 8 August 1980 (45 Federal Register [FR] 52803). On 22 October 2012 the U.S. Fish and Wildlife Service (USFWS) issued a proposed rule to remove the designation of the VELB as a threatened species; however, on 29 August 2014 the USFWS formally withdrew the proposed rule (79 FR 55879). The Project is not located within critical habitat for the VELB (USFWS 1980).

The VELB is associated exclusively with elderberry (*Sambucus* species) shrubs in the Central Valley and adjacent foothills during its entire 2-year life cycle. Adult VELB lay their eggs on elderberry stems. Following egg-laying, larvae bore into the elderberry stems and feed upon the pith. They emerge through a round exit or emergence hole upon completion of this life stage. They are typically associated with elderberry stems and trunks that are greater than one inch in diameter at ground level. The USFWS considers all elderberry shrubs containing stems greater than one inch in diameter at ground level as potential VELB habitat. VELB most commonly occur in areas within, or near, some type of riparian corridor containing other woody plant species such as willow *(Salix* spp.), cottonwood *(Populus fremontii* ssp. *fremontii),* wild grape (*Vitis californica),* and box elder *(Acer negundo).* Population densities of the VELB are probably naturally low (USFWS 1984), and it has been suggested based on the spatial distribution of occupied shrubs, that the VELB has limited dispersal capabilities. Low density and limited dispersal capability may cause the VELB to be vulnerable to the adverse effects of the isolation of small subpopulations due to habitat fragmentation.

3.0 METHODOLOGY

Madrone senior biologist Daria Snider conducted surveys of a portion of the Study Area on 16 November 2016, in accordance with the survey protocol outlined in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999), and surveys in remaining portions of the Study Area on 6 July, 17 August, and 19 October 2017 in accordance with the recently-issued *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (Framework) (USFWS 2017). All of the surveys were consistent with the Framework, which requires reporting of the number of shrubs present rather than the historically reported stem counts.

The Study Area was thoroughly surveyed for elderberry shrubs. All elderberry shrubs with stems greater than one inch in diameter that were found within the Study Area were mapped with a GPS unit capable of sub-meter accuracy, all visible stems were searched for VELB exit holes, and riparian position was recorded.

4.0 GENERAL SITE CONDITIONS AND HABITAT

The Study Area is largely comprised of agricultural fields and Old Alamo Creek, with its associated Valley oak (*Quercus lobata*) riparian corridor. The agricultural fields were planted primarily in alfalfa (*Medicago sativa*) during the field visits. A few irrigation canals that convey water to and from the agricultural fields run through the portion of the Study Area north of Old Alamo Creek. A narrow strip of regularly-mowed non-native annual grassland occurs along the southern edge of a large portion of the Study Area, just north of Elmira Road. A small mesic area runs between Old Alamo Creek and what appears to be a stormdrain drop inlet within this annual grassland strip. A residential property is present in the southwestern corner of the Study Area; this area has a number of buildings, scattered large Valley oak trees, and ornamental vegetation, but is otherwise largely unvegetated. Ruderal vegetation occurs in small patches, scattered throughout the Study Area, mostly on field edges, adjacent to portions of the irrigation canal, or between the riparian corridor and roadways.

Surrounding lands to the north, east and south are largely similarly agricultural with scattered rural residences, although a portion of the Study Area extends into and is surrounded by the rural community of Elmira. Properties to the west are developed. The Study Area is very flat, and slopes very slightly from west to east. Elevations range from 94 feet above mean sea level in the southwestern corner to approximately 70 feet at the eastern end, along Old Alamo Creek.

4.1 Terrestrial Vegetation Communities

4.1.1 Non-Native Annual Grassland

A narrow strip of non-native annual grassland occurs to the north of Elmira Road. This strip appears to be both the road right-of-way and a sewer or storm drain maintenance easement. As such, it was mowed during all of our field visits, and the dominant grasses were unidentifiable. However, it is assumed to be dominated common annual grassland species in the area, such as soft brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), perennial ryegrass (*Festuca perennis*), and wild oats (*Avena fatua*). Forbs observed intermittently in this area include yellow star-thistle (*Centaurea solstitialis*), prickly wild lettuce (*Lactuca serriola*), and wild radish (*Raphanus sativus*). A mesic inclusion in this strip is occupied by different plant species, including slender wheatgrass (*Elymus trachycaulus*), sorghum (*Sorghum halepense*), prickly sow-thistle (*Helminthotheca echioides*), Bermuda grass (*Cynodon dactylon*), alkali mallow (*Malvella leprosa*), curly dock (*Rumex crispus*), spring vetch (*Vicia sativa*), and chicory (*Cichorium intybus*).

4.1.2 Valley Oak Riparian Woodland

A well-developed Valley oak (*Quercus lobata*) riparian woodland occurs along both sides of Old Alamo Creek for most of its length through the Study Area. Within the Study Area, this community is relatively diverse. Dominant tree species include Valley oak, Fremont's cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), red willow (*S. laevigata*), English walnut (*Juglans regia*), and black walnut (*Juglans hindsii*). Dominant shrubs in the understory include Himalayan blackberry (*Rubus armeniacus*), wild rose (*Rosa californica*), and sandbar willow (*Salix exigua*). Santa Barbara sedge (*Carex barbarae*) beds occupy large areas in the understory of this community, in between the Himalayan blackberry and the wild rose. The dense cover of these species leaves very little remaining space in the understory for other herbaceous vegetation. Other plant species observed relatively frequently in this community include cultivated almond (*Prunus dulcis*), olive (*Olea europaea*), blue elderberry (*Sambucus nigra* ssp. *cerulea*), tree of heaven (*Ailanthus altissima*), California bay laurel (*Umbellularia californica*), and eucalyptus (*Eucalyptus* species).

The portion of Old Alamo Creek south of Elmira Road supports a much more dense Valley oak riparian woodland. Although the large, overstory trees are consistent with the description above, the channel itself has been rendered virtually inaccessible due to an extremely tall, dense thicket of Himalayan blackberry, and in areas along the northern edge of the creek, a dense sandbar willow thicket.

4.1.3 Ruderal

Ruderal vegetation occurs in small patches throughout the Study Area. This community is comprised largely of non-native forbs, but some grasses are also present. Plant species commonly observed in this community within the Study Area include wild radish, velvet leaf (*Abutilon theophrasti*), tomatillo (*Physalis philadelphica*), lambs quarters (*Chenopodium album*), bull mallow (*Malva nicaeensis*), prickly sow thistle, sorghum, wild oats, winter vetch (*Vicia villosa*), jungle rice (*Echinochloa colona*), chickweed (*Stellaria media*), henbit (*Lamium amplexicaule*), alkali mallow, sweet fennel (*Foeniculum vulgare*), and poison hemlock (*Conium maculatum*).

4.2 Aquatic Resources

4.2.1 Old Alamo Creek

Old Alamo Creek is an intermittent drainage that runs through the southern portion of the Study Area, and is bordered on both sides by a well-developed Valley oak woodland. In the central portion of the Study Area, this feature straightens out, and is bordered only by herbaceous vegetation. In the eastern portion of the Study Area, the channel of the creek is almost entirely obscured by Himalayan blackberry. Although some deeper portions of the creek appear to pond water perennially in stagnant pools, much of the creek through the Study Area dries out during the summer. The creek is quite broad through the woodland areas, ranging from 20-30 feet or more in width. In the central reach, it narrows down to just 10 feet wide.

4.2.2 Irrigation Canal

The Irrigation Canals that run through the Study Area convey water from the Solano Irrigation District's (SID's) Putah South Canal to agricultural fields both on-site and off-site. Portions of these canals are concrete-lined, while other portions are well-maintained dirt-lined canals. As such, there is little to no vegetation within or on the banks of these features.

4.2.3 Irrigation Ditch

Irrigation Ditches in the southern portion of the Study Area appear to drain irrigation water from the southern agricultural fields into Old Alamo Creek. These features are much smaller than the irrigation canals, and although they are unvegetated within the channel, the banks are densely vegetated with weedy facultative species such as curly dock, sorghum, and prickly cocklebur.

4.2.4 Roadside Ditch

A roadside ditch is present along the northern border of the Study Area, just south of Hawkins Road. The roadside ditch collects runoff from Hawkins Road, and conveys it east through a series of off-site ditches into Ulatis Creek. This feature is primarily unvegetated due to ditch maintenance, but some ruderal vegetation has become established in portions. Plant species observed in and adjacent to this feature include pigweed amaranth (*Amaranthus albus*), wild radish, tall nutsedge, dallisgrass, and wild carrot (*Daucus carota*).

5.0 SURVEY RESULTS

Eighteen elderberry shrubs with stems greater than one inch in diameter were found within the Study Area, all of them within the Valley oak riparian woodland along Old Alamo Creek (**Figure 2**). All of the elderberry shrubs within the Study Area were in riparian locations, but none of them exhibited exit holes typical of VELB.

6.0 CONCLUSION

Eighteen elderberry shrubs are present within the Study Area. All of the shrubs were considered riparian, but none exhibited exit holes indicative of VELB. No VELB were observed during the survey.

7.0 REFERENCES

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1980. *Listing the Valley Elderberry Longhorn Beetle as a Threatened Species with Critical Habitat; Final Rule*. Federal Register Volume 45, Number 155 (August 8, 1980).

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1984. *Valley Elderberry Longhorn Beetle Recovery Plan*. U. S. Fish and Wildlife Service, Portland, Oregon. 62 pp.

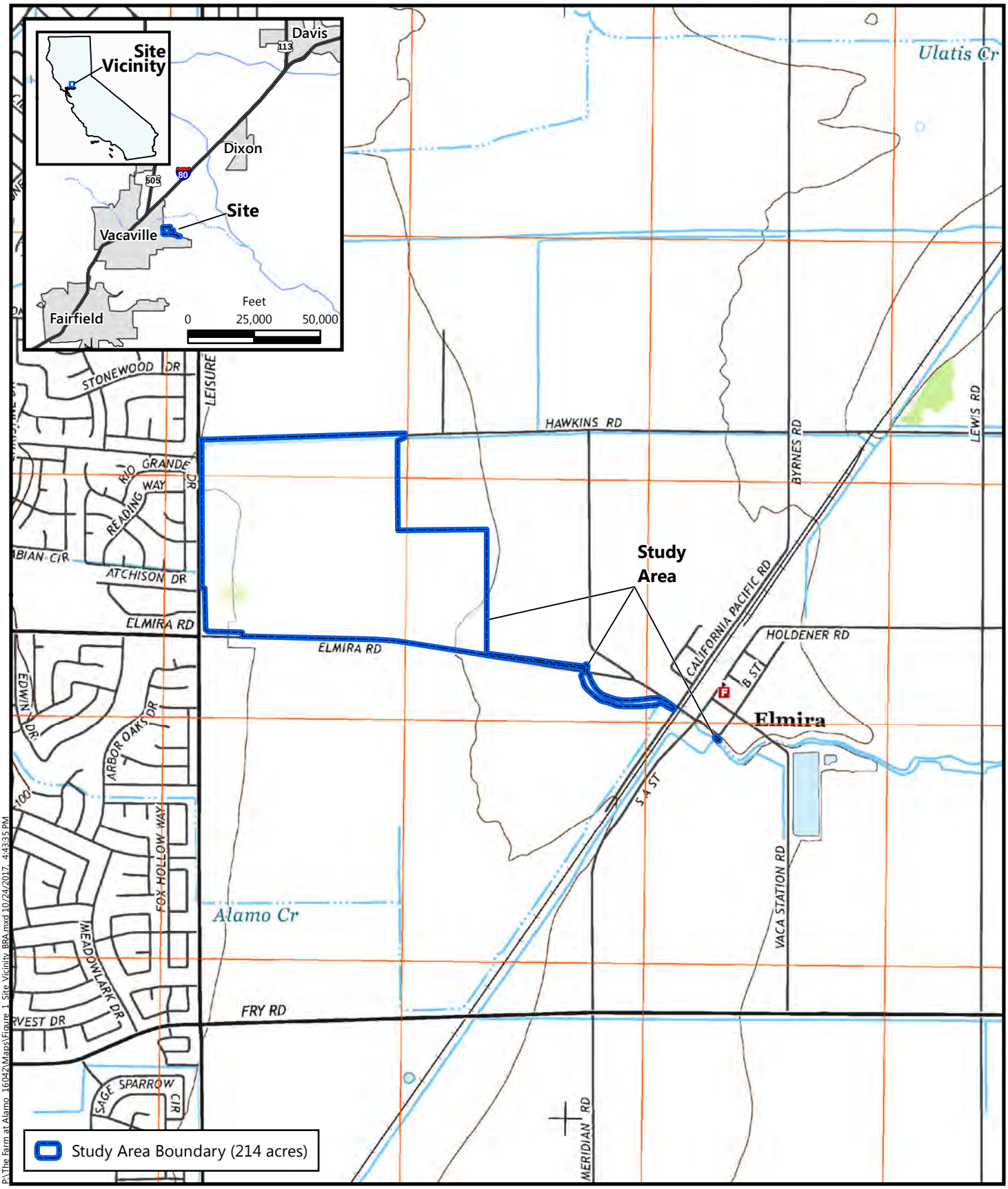
U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1999. *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*. Dated July 9, 1999.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2014. *Withdrawal of the Proposed Rule to Remove the Valley Elderberry Longhorn Beetle from the Federal List of Endangered and Threatened Wildlife*. Federal Register Volume 79, Number 180 (September 17, 2014).

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2017. *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle*. Dated May 2017.

U.S. Department of the Interior, Geological Survey (USGS). 2015. *Elmira, California* 7.5-minute Quadrangle. Geological Survey. Denver, Colorado.

Figures



P:\The Farm at Alamo_16042\Maps\Figure 1_Site_Vicinity_BRA.mxd 10/24/2017 4:43:35 PM

Source: United States Geologic Survey, 2015.
"Elmira, California" 7.5-Minute Topographic Quadrangle
Section 19, Township 6 North, Range 1 East, MDB&M
Section 24, Township 6 North, Range 1 West, MDB&M
Longitude -121.924576, Latitude 38.353867

Figure 1
Site Vicinity

The Farm at Alamo Creek
Solano County, California

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Aerial Source: *USDA, National Agriculture Imagery Program,* 30 May 2016

Figure 2
Elderberry Shrub Location Map

The Farm At Alamo Creek
Solano County, California

MADRONE ECOLOGICAL CONSULTING

July 25, 2017 10386

Thomas Phillippi
Phillippi Engineering Inc.
425 Merchant Street, Suite 200
Vacaville, California 95696

Subject: Wildlife Hazards Analysis for The Farm at Alamo Creek

Dear Mr. Phillippi,

This memorandum presents Dudek's findings from a wildlife hazards analysis (WHA) of The Farm at Alamo Creek project (proposed project). A portion of the proposed project site (approximately 56 acres) falls within the Outer Perimeter of the Travis Air Force Base (AFB) Land Use Compatibility Plan (Solano County Department of Resource Management 2015), and as stated in Section 5.8.2.c of the Land Use Compatibility Plan (LUCP), all discretionary projects located within the Bird Strike Hazard Zone and Outer Perimeter are required to consider the potential for a project to attract hazardous wildlife, wildlife movement, or bird strike hazards as part of the environmental review process required by the California Environmental Quality Act (CEQA). Therefore, the proposed project's potential to attract wildlife that could result in hazards to aircraft has been evaluated.

LOCAL REGULATIONS AND MILITARY GUIDANCE REGARDING BIRD-AIRCRAFT STRIKE HAZARD

The proposed project is subject to two planning documents that require consideration of wildlife hazards to aircraft, as discussed below[1].

Vacaville General Plan

The Vacaville General Plan Land Use Element identifies Areas of Special Consideration, which are specific areas of the city where more detailed design and development guidance is applied (City of Vacaville 2015, p. LU 41 and Figure LU-7). Among these areas are the Travis AFB Airport Land Use Compatibility Zones, which are shown on Figure LU-5 of the Land Use Element.

[1]Federal Aviation Administration guidance (e.g., Advisory Circular 5200) does not apply to the proposed project because it only applies to projects near civilian airfields. Travis AFB is a military airfield,

The Land Use Element includes the following goals and policies relevant to development within the Travis Air Force Base Airport Land Use Compatibility Zones:

Goal LU-27	Ensure that development near the Nut Tree Airport and Travis Air Force Base is compatible with airport uses and conforms to safety requirements.
Policy LU-P27.3	Ensure that land uses in the vicinity of Nut Tree Airport, or potentially affected by Travis Air Force Base, are compatible with airport operations and are consistent with the Airport Land Use Compatibility Plans for both airports.
Policy LU-P27.5	Continue to refer development proposals within the Nut Tree Airport and Travis Air Force Base Compatibility Districts to the Solano County Airport Land Use Commission.
Policy LU-P27.7	Notwithstanding other provisions of the General Plan, land use changes and development approvals within the Vacaville Planning Area shall be consistent with the Nut Tree Airport and Travis Air Force Base Airport Land Use Compatibility Plans (ALUCP).

Travis AFB Land Use Compatibility Plan

A portion of the proposed project site (approximately 56 acres) falls within the Outer Perimeter of the Travis AFB LUCP (Solano County Department of Resource Management 2015), but outside its Bird Strike Hazard Zone, as shown on Figure 1. The LUCP requires a WHA be prepared if land uses are proposed within the Outer Perimeter of Travis AFB, as defined in the LUCP. The WHA must analyze the proposed project's potential to attract wildlife that could result in potential hazards to aircraft. Specifically, the LUCP requires the following:

> (a) Reviewing agencies shall prepare a WHA for projects that have the potential to attract wildlife that could cause bird strikes. If the land use development would comply with the policies of the 2002 LUCP with respect to bird strike hazards within the Bird Strike Hazard Zone, then based on the findings of the WHA, all reasonably feasible mitigation measures must be incorporated into the planned land use. Expansion of existing wildlife attractants includes newly created areas and increases in enhanced or restored areas.

(b) Outer Perimeter: Outside the Bird Strike Hazard Zone but within the Outer Perimeter, as shown on Figure 4, any new or expanded land use involving discretionary review that has the potential to attract the movement of wildlife and cause bird strikes are required to prepare a WHA. Expansion of existing wildlife attractants includes newly created areas and increases in enhanced or restored areas. The WHA must demonstrate wildlife movement that may pose hazards to aircraft in flight will be minimized.

(c) All discretionary projects located within the Bird Strike Hazard Zone and Outer Perimeter are required to consider the potential for the project to attract hazardous wildlife, wildlife movement, or bird strike hazards as part of environmental review process required by the California Environmental Quality Act (CEQA).

The LUCP also states that the Solano County Airport Land Use Commission (ALUC) would begin preparing an implementation program to address, among other things, the parameters of a WHA, including what a WHA must contain to satisfy the ALUC's review requirements, within 12 months of the adoption of the LUCP. At the time of this WHA preparation, the implementation program is not available. Therefore, the analysis provided in this WHA focuses on changes in bird strike hazards relative to existing site conditions and steps that should be taken to minimize attractiveness of the site to birds.

EXISTING BIRD ATTRACTANTS AT THE PROPOSED PROJECT SITE

The proposed project site comprises 210.5 acres and is bounded by Leisure Town Road (Future Jepson Parkway) on the west, Hawkins Road on the north, Elmira Road and a portion of Old Alamo Creek on the south, and agricultural fields on the east (Figure 1). Although only approximately 56 acres of the project site falls within the Outer Perimeter, this section describes the existing uses on the entire project site that could attract wildlife, especially birds. Design features suggested later in the memorandum focus on the areas within the Outer Perimeter, which include the pond/detention basin and recreational fields.

Agricultural Land Uses

Undeveloped agricultural land is adjacent to the northern and eastern boundaries of the proposed project site.[2] The proposed project site also includes agricultural land that has primarily been used for growing row crops, with the dominant crops depending on the year. The dominant crops

[2] The southern boundary of the proposed project site currently abuts Elmira Road where the Brighton Landing Specific Plan project is currently under construction adjacent to the south side of Elmira Road.

were corn and other cereal grains from 2007 to 2011, sunflowers in 2012, tomatoes in 2013, and alfalfa and clover from 2014 to present (Figure 2).

Surface Waters

Existing surface waters on the proposed project site are limited to Old Alamo Creek, which traverses the southern portion of the site, and a Solano Irrigation District (SID) right-of-way that borders the site on the west and north and conveys irrigation water through an earth-lined ditch. Based on aerial photographs, the SID ditch appears to remain full or nearly full most of the time. Agricultural ditches traverse the property in various locations and are used to temporarily convey water to the on-site agricultural operations.

Non-Agricultural Vegetation

On the northern and southern sides of the western portion of Old Alamo Creek that bisects the proposed project site there is a large grove of mature trees totaling approximately 1.5 acres. Dense stands of deciduous and evergreen trees such as these can provide roosting sites for flocks of starlings or blackbirds. Vegetation also surrounds the remainder of Old Alamo Creek further east, although it is primarily woody shrubs and herbaceous vegetation that provide minimal cover for roosting or nesting.

Structures

One home and several outbuildings are located in the western margin of the site on Leisure Town Road.

EFFECTS OF LAND USE CHANGES AND SITE DEVELOPMENT ON BIRD ATTRACTANTS

The proposed project would affect the attractiveness of the site for birds, with most of the alterations resulting in reduced attractants across the site, but with some project elements likely increasing the attractiveness of the site in particular areas (Figure 3).

Removal of Agriculture and Replacement with Urban Development

The proposed project would include removal of approximately 188 acres of land in active agricultural use that would be replaced with developed land uses, including residential structures, community facilities, commercial development, and roadways. Agricultural operations on these lands in the last 10 years have included extensive areas of cereal grains and sunflowers, both of which are

highly attractive to birds when the crop matures. Alfalfa and hay have also been major crops on this site, and these crops can attract large flocks of birds when the crop is drying before harvest.

The proposed project would also change the earth-lined ditch that conveys agricultural water along the northern boundary of the site to a buried pipeline. The other irrigation canal that traverses the central portion of the site would be removed because it would no longer be needed. That would eliminate approximately 1.7 acres[3] of open water from the site that is available throughout the year for use by birds and that could be an attractant.

Construction of Detention Basin/Pond

The proposed project includes an approximately 10-acre detention basin that would collect stormwater overflows from Old Alamo Creek. The basin is located in the southeast corner of the project site within the boundary of the Outer Perimeter, as shown on Figure 3. The basin would include irregular shaped banks, with a slope of 3:1 or 4:1. These relatively shallow slopes would allow large water birds to easily exit and enter the detention basin from the shore. The detention basin would be excavated to approximately 15 feet deep to accommodate peak flows from the Creek. Due to the shallow groundwater table, the lower portion of the basin would remain inundated year-round with 7 to 9 feet of water. This year-round inundation would provide an attractant for migrating birds within the Pacific Flyway and for other non-migratory birds seeking water during drought periods.

Addition of Recreational and Open Space Uses

The proposed project would include a variety of open space and park features that have the potential to attract wildlife. Not all of these features are located entirely within the boundary of the Outer Perimeter as shown on Figure 3; the areas that overlap are noted below. The proposed 8.2-acre "Play 4 All" park falls partially within the Outer Perimeter but does not appear to contain elements that would attract birds, so is not included in the following list:

- Creation and landscaping of a recreational trail around the detention basin/pond—estimated as 5 total acres (entirely within Outer Perimeter)
- A City park with two soccer fields and a baseball park totaling approximately 11.2 acres (approximately 8 acres within Outer Perimeter)

[3] Based on a review of aerial photographs of the proposed project site, it was determined that water in the irrigation channels on the western and northern sides of the proposed project site are an average of 17 feet wide and extend 4,275 feet. With few exceptions, these channels were full to the banks in every aerial photograph regardless of the season.

- An open space/agricultural buffer area north of the detention basin totaling approximately 4.3 acres. (approximately 2.2 acres within Outer Perimeter)
- Landscaping and enhanced trails along Old Alamo Creek totaling approximately 4.6 acres (approximately 1.5 acre within Outer Perimeter)

These open space and park areas would result in a total of approximately 16.7 acres within the Outer Perimeter of a land use that could potentially attract birds.

Depending on the plants selected for landscaping within the recreational or open space areas, any of these areas have the potential to attract birds, either for perching/roosting or to consume fruits produced by the landscaping.

Landscaping within the Proposed Project Area

The proposed project has prepared a preliminary planting palette (Tables 1, 2, 3, and 4). Tables 1 through 4 also provide brief analyses as to the potential for each species to attract birds and the type of attractions. The potential to attract birds is based primarily on their production of fruit or attractive seeds and canopy formation that encourages perching or roosting. Because of the distance of the project site from Travis AFB, and the fact that most of the site is located outside the Outer Perimeter, these attractants are much less important than if they were located near the AFB or within the Bird Strike Hazard Zone. Because they pose no threat to aircraft, the potential to attract hummingbirds are not considered adverse.

The Specific Plan notes that a key element of the proposed project would be fruit trees scattered around the proposed project site, and a large orchard along the east side of Leisure Town Road. These fruit trees have the potential to attract birds, especially if the fruit falls to the ground and is not promptly removed. Most groundcover planting would be native drought tolerant grasses. The grove of mature trees along Old Alamo Creek noted above would be retained and incorporated into a natural park area, and trees would be regularly trimmed and maintained.

SUGGESTED DESIGN FEATURES TO MINIMIZE WILDLIFE ATTRACTANTS AT THE PROPOSED PROJECT SITE

This section identifies ways in which the proposed project could be designed to minimize bird attractants on the proposed project site. The suggestions are listed in order of priority, based on their expected effectiveness.

Pond/Detention Basin Design (High Priority)

At approximately 10 acres of open water, this detention basin presents a substantial new source of water on the site. The design of the detention basin/pond can affect its attractiveness to waterfowl, which are the primary threat to aircraft. Below are some suggestions to reduce issues associated with the detention basin/pond:

- Increase pervious surfaces (e.g., pervious pavements, bioswales) elsewhere in the proposed project site to reduce the required size of the detention basin.
- Configure the detention basin and surroundings to reduce line of sight for birds. Many waterfowl have a shallow angle on their approach for landing or takeoff from water, and reducing their line of sight can make birds less likely to use an area of open water. This includes using steeper embankments (not less than a 2:1 slope), narrower/longer configurations (ideally a 3:1 minimum length to width ratio), shrub-height or greater height vegetation along the lip of the pond, post and cable fences, or other installations that disrupt sight lines and reduce comfort and habitat suitability for waterfowl. Given public access to the pond area, some of this may not be feasible for safety reasons, such as the steep slopes.
- Maintain a stand of trees between the detention basin/pond and any nearby fields so that large birds cannot easily pass between them.

Discouraging Loafing Birds on Park/Recreation Fields (Moderate Priority)

Park/recreation fields can often provide an attractive space for "loafing" and grazing behavior for larger birds, especially Canada geese and coots. This is especially true if the fields are not in regular use. A portion of the recreation fields within a proposed City park would be located within the Outer Perimeter (Figure 3). If these species are found to be occupying the fields, an active hazing program should be developed to chase the birds away. Hazing can take many forms, but the presence of humans on the field on a regular basis can sometimes be enough to reduce the potential for loafing.

Some turf grass species such as tall fescue are less attractive for bird grazing, especially when compared to Kentucky bluegrass. Turf grass can also be treated with anthraquinone, which is available in commercial formulations with UV dyes visible to birds (but not humans). The dyes, combined with the unpleasant digestive effects of the anthraquinone, can condition the birds to avoid the fields.

Educational Signage (Moderate Priority)

The proposed project should install signage near any areas where large birds such as ducks or geese might gather that discourage residents or visitors from feeding the birds. This would

include the recreation fields and the detention basin/pond. The proximity to Travis AFB, proper bird nutrition and health, and the issues regarding bird strike hazard, as well as the issues associated with loafing birds and sanitation, could be mentioned. These efforts could reduce human feeding of birds on site, which would help reduce bird aggregations on the proposed project site.

Eliminating Fruit Trees and Other Attractive Vegetation (Low Priority)

The proposed project site is relatively far from Travis AFB, which reduces the importance of the on-site vegetation relative to wildlife hazards. However, the inclusion and promotion of fruit trees on the site is inconsistent with wildlife hazard management. Fruit trees can be a strong bird attractant, especially if the fruit is not removed before ripening. It is recommended that the number of fruit trees be reduced, and those trees replaced with ones identified as "low attractiveness," as analyzed in Tables 1 through 4. If a greater number of fruit trees is desired, we recommend that grounds maintenance staff emphasize removal of fruits before they fall to the ground.

CONCLUSIONS

Overall, by eliminating agricultural operations the proposed project will remove 188 acres of land use that attracts flocks of birds. However, flocks of smaller and medium-sized birds are not a primary concern within the Travis AFB Outer Perimeter Area. Because the proposed project is located outside the Travis AFB Bird Strike Hazard Zone, the key factor to consider is whether the proposed project would create a destination that birds would fly to, crossing the Bird Strike Hazard Zone in the process.

As noted in the effects analysis, two aspects of the proposed project have the greatest potential for new wildlife attractants that could make the proposed project site a destination. These aspects include the recreational fields, which can attract larger grazing birds such as Canada geese and coots, and the detention basin/pond, which can attract a range of larger-bodied waterbirds such as ducks, geese, and swans.

However, by implementing the suggested design features above, especially those that pertain to the detention basin and the park/recreation fields, the proposed project applicant can credibly state that they have reduced the bird attractants at the proposed project site to an acceptable level, and that the proposed project would not increase bird strike hazard to aircraft at Travis AFB.

Sincerely,

Mike Henry, PhD
Senior Ecologist

Att: Figures 1–3

REFERENCES

City of Vacaville. 2015. "Chapter 2: Land Use Element." In *Vacaville General Plan.*

Solano County Department of Resource Management. 2015. *Travis Air Force Base (AFB) Land Use Compatibility Plan*. Adopted by Solano County Airport Land Use Commission. October 8, 2015.

Table 1
Review Of Site Interior Canopy Trees Palette

Botanical Name	Common Name	Potential to Attract Birds
Acer nigrum	Black maple	Low attractiveness. Small birds eat the seeds, and canopy provides perching area.
Acer platanoides	Norway maple	Low attractiveness. Small birds eat the seeds, and canopy provides perching area.
Betula utilis jacquemontii	Himalayan birch	Low attractiveness. Canopy provides perching area.
Carpinus betulus fastigiata	Upright European hornbeam	Low attractiveness. Canopy provides perching area.
Celtis occidentalis	Common hackberry	Moderate attractiveness. Purple fruit strongly attract small birds.
Ceratonia siliqua	Carob tree	Low attractiveness. Pods generally cannot be opened. Canopy provides perching area.
Fraxinus holotricha 'Moraine'	Moraine ash	Low attractiveness. Canopy provides perching area.
Fraxinus oxycarpa 'Raywood'	Raywood ash	Low attractiveness. Canopy provides perching area.
Gleditsia triacanthos	Honey locust	Assuming the seedless cultivar is used, low attractiveness. Canopy provides perching area.
Ginkgo biloba	Maidenhair tree	Moderate attractiveness for female plant, which produces substantial fruit. Low attractiveness for male. Either provides a usable canopy for perching.
Liriodendron tulipifera	Tulip tree	Low attractiveness. Canopy provides perching area.
Magnolia grandiflora	Southern magnolia	Low attractiveness. Seeds are eaten by songbirds, wild turkey, and smaller migratory birds. Canopies can provide perching area.
Maytenus boaria	Mayten tree	Low attractiveness, wind moves branches enough to discourage much perching.
Pinus canariensis	Canary island pine	Low attractiveness. Small birds eat the seeds, and canopy provides perching area.
Pistacia sinensis	Chinese pistache	Low attractiveness. Canopy of minimal value for perching.
Platanus occidentalis	American sycamore	Low attractiveness. Canopy provides perching area.
Podocarpus gracilior	African fern pine	Moderate attractiveness. Cherry-sized fruit attractive to birds.
Rhus lancea	African sumac	Low to moderate attractiveness. Birds will eat the fruit, but it is not a preferred food. Canopy provides perching area.
Robinia ambigua 'idahoensis'	Idaho locust	Low attractiveness. Canopy provides perching area.
Schinus molle	False pepper tree	Moderate attractiveness. Berries are attractive to smaller birds.
Tilia cordata	Little leaf linden	Low attractiveness. Small birds eat the seeds, and canopy provides perching area.

Table 2
Review Of Street Trees Palette

Botanical Name	Common Name	Potential to Attract Birds
Fraxinus uhdei	Evergreen ash	Low attractiveness. Canopy provides perching area.
Tilia cordata	Little leaf linden	Low attractiveness. Small birds eat the seeds, and canopy provides perching area.
Platanus racemosa	California sycamore	Low attractiveness. Canopy provides perching area.
Quercus agrifolia	Coast live oak	Low attractiveness. Canopy provides perching area.
Celtis occidentalis	Common hackberry	Moderate attractiveness. Purple fruit strongly attract small birds.
Pistacia sinensis	Chinese pistache	Low attractiveness. Canopy provides perching area.
Carpinus betulus fastigiata	European hornbeam	Low attractiveness. Canopy provides perching area.
Acer buergerianum	Trident maple	Low attractiveness. Canopy provides perching area.
Robinia ambigua 'idahoensis'	Idaho locust	Low attractiveness. Canopy provides perching area.
Malus 'Profusion'	'Profusion' crape myrtle	Low attractiveness. Canopy provides perching area.
Malus 'Marilee'	'Marilee' crape myrtle	Low attractiveness. Canopy provides perching area.
Lagerstroemia 'Muskogee'	'Muskogee' crape myrtle	Low attractiveness. Canopy provides perching area.
Lagerstroemia 'Arapaho'	'Arapaho' crape myrtle	Low attractiveness. Canopy provides perching area.
Pyrus calleryana 'Aristocrat'	'Aristocrat' pear	Low attractiveness as it is a fruitless pear. Canopy provides perching area.
Pyrus 'New Bradford'	'New Bradford' pear	Low attractiveness as it is a fruitless pear. Canopy provides perching area.
Maytenus boaria	Mayten tree	Low attractiveness. Canopy provides perching area.
Lagerstroemia 'Natchez'	'Natchez' crape myrtle	Low attractiveness. Small birds eat the seeds throughout winter, and canopy provides perching area.
Koelreuteria paniculata	Golden rain tree	Low attractiveness. Fruits remain on trees and are not sought after by birds. Canopies can provide perching area.
Aesculus carnea	Red horse chestnut	Low attractiveness. Seeds are toxic unless cooked. Canopies can provide perching area.
Lagerstroemia 'Snowdrift'	'Snowdrift' crape myrtle	Low attractiveness. Small birds eat the seeds throughout winter, and canopy provides perching area.
Chionanthus retusus	Chinese fringe tree	Moderate attractiveness. Produce olive-like fruit that can be attractive to birds.
Albizia julibrissin	Mimosa	Low attractiveness.
Magnolia virginiana	Sweet bay magnolia	Low attractiveness. Seeds are eaten by songbirds, wild turkey, and smaller migratory birds. Canopies can provide perching area.

Table 3
Review Of Site Interior Ornamental Tree Palette

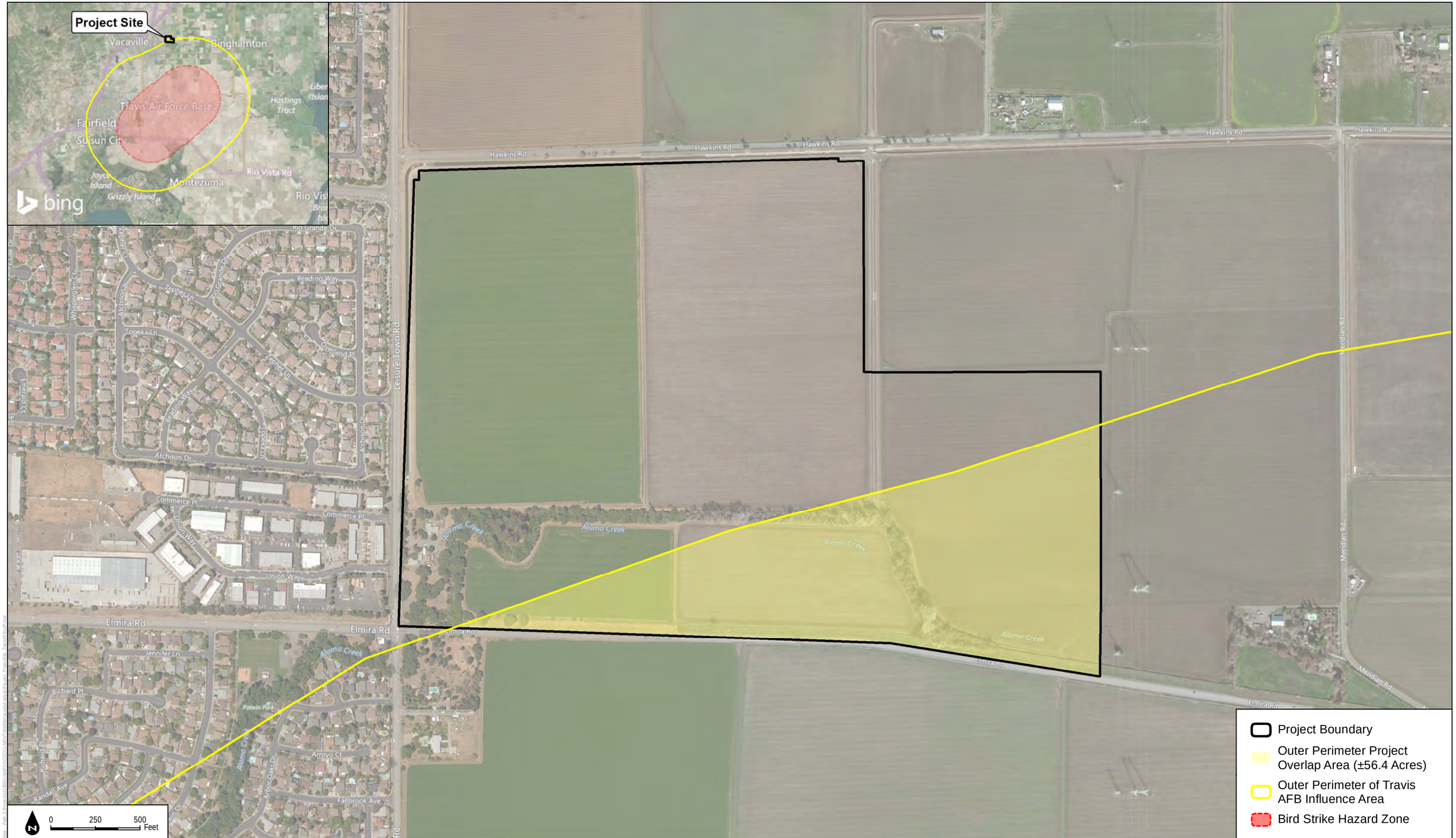
Botanical Name	Common Name	Potential to Attract Birds
Acacia longifolia	Golden wattle	Low attractiveness. Seeds can be attractive to small birds, and canopies can provide perching area.
Aesculus carnea	Red horse chestnut	Low attractiveness. Seeds are toxic unless cooked. Canopies can provide perching area.
Albizia julibrissin	Mimosa	Low attractiveness.
Ceanothus arboreus	Island ceanothus	Low attractiveness.
Chionanthus retusus	Chinese fringe tree	Moderate attractiveness. Produce olive-like fruit that can be attractive to birds.
Cornus florida 'Cherokee'	'Cherokee' eastern dogwood	Moderate attractiveness. Bright red fruit strongly attract small birds.
Cornus nuttallii	Pacific dogwood	Moderate attractiveness. Bright red fruit strongly attract small birds.
Corymbia ficifolia	Red flowering gum	Low attractiveness. Flowers attract nectar-feeding birds, and canopies can provide perching area.
Elaeagnus angustifolia	Russian olive	Moderate to high attractiveness. Considered inappropriate for use in airport settings, but may be allowable in small amounts at this distance from AOA.
Koelreuteria paniculata	Golden rain tree	Low attractiveness. Fruits remain on trees and are not sought after by birds. Canopies can provide perching area.
Lagerstroemia indica	Crape myrtle	Low attractiveness. Small birds eat the seeds throughout winter, and canopy provides perching area.
Magnolia virginiana	Sweet bay magnolia	Low attractiveness. Seeds are eaten by songbirds, wild turkey, and smaller migratory birds. Canopies can provide perching area.
Malus species	Crabapple	Potentially highly attractive. Recommend selecting only cultivars that flower but don't produce fruit, such as "Spring Snow" and "Prairie Rose."
Melaleuca linariifolia	Flaxleaf paperbark	Low attractiveness. Small birds may eat the seeds. Broad canopy supports perching.
Parkinsonia aculeata	Jerusalem thorn	Low attractiveness. Small birds may eat the seeds.
Paulownia tomentosa	Empress tree	Low attractiveness. Broad canopy supports perching.
Prunus cerasifera	Purpleleaf plum	Assuming this is the fruitless cultivar, low attractiveness. Canopies can provide perching area.
Pyrus calleryana 'Aristocrat,' 'New Bradford'	'Aristocrat' and 'New Bradford' Flowering pear	Low potential as it is a fruitless pear, if tree crowns are touching can provide shelter for flocks.
Prunus x 'yedoensis'	Daybreak cherry	Moderately to highly attractive due to fruit that is sought after by birds. Broad canopy supports perching.
Styphnolobium japonicum	Japanese pagoda tree	Low attractiveness. Broad canopy supports perching.

Table 4
Review Of Shrub Planting Palette

Botanical Name	Common Name	Potential to Attract Birds
Abelia grandiflora	Glossy abelia	Low attractiveness.
Arctostaphylos bakeri 'Louis Edmund'	'Louis Edmund' manzanita	Low attractiveness.
Arctostaphylos densiflora 'Howard McMinn'	'Howard McMinn' manzanita	Low attractiveness.
Aloe arborescens	Torch aloe	Low attractiveness.
Artemisia arborescens	Tree wormwood	Low attractiveness.
Buxus microphylla	Boxwood	Low attractiveness.
Buddleja davidii	Butterfly bush	Low attractiveness.
Ceanothus species	California lilac	Low attractiveness.
Ceratostigma griffithii	Burmese plumbago	Low attractiveness.
Cistus hybrid species	White rockrose	Low attractiveness.
Choisya ternata	Mexican orange	Low attractiveness.
Crocosmia x crocosmiiflora	Montbretia	Moderate attractiveness if female. Seedpods attract medium-sized birds.
Dietes grandiflora	Fortnight lily	Low attractiveness.
Eriogonum umbellatum polyanthum	Sulfur buckwheat	Low attractiveness. Small seeds attract smaller birds.
Escallonia x exoniensis	Escallonia	Low attractiveness.
Euonymus japonicus	Evergreen euonymus	Low attractiveness.
Garrya elliptica	Coast silk-tassel	Moderate attractiveness if female. The fruits are attractive to medium-sized birds.
Ilex species	Holly	Varies depending on species. Some are attractive. *Ilex aquifolium* has very low attractiveness.
Lavandula species	Lavender	Low attractiveness.
Lavatera maritima	Tree mallow	Low attractiveness.
Leucophyllum frutescens	Texas ranger	Low attractiveness.
Ligustrum japonicum	Japanese privet	Moderately attractive if female. Small- and medium-sized birds eat the fruit of this plant. Berries are also poisonous to humans.
Lonicera species	Honeysuckle	Moderately attractive if female. Small- and medium-sized birds eat the fruit of this plant. Several species also poisonous.

Table 4
Review Of Shrub Planting Palette

Botanical Name	Common Name	Potential to Attract Birds
Mahonia aquifolium	Oregon grape	Moderately attractive if female. Small- and medium-sized birds eat the fruit of this plant.
Myrica californica (now Morella californica)	Pacific wax myrtle	Low attractiveness.
Myrsine africana	African boxwood	Moderately attractive if female. Small- and medium-sized birds eat the fruit of this plant.
Myrtus communis	Myrtle	Moderately attractive if female. Small- and medium-sized birds eat the fruit of this plant.
Osmanthus species	Sweet olive	Low attractiveness.
Phormium tenax	New Zealand flax	Low attractiveness.
Photinia x fraseri	Fraser photinia	Low attractiveness.
Pittosporum eugenioides	Lemon wood	Moderately attractive if female. Small- and medium-sized birds eat the fruit of this plant.
Plumbago auriculata	Cape plumbago	Very low attractiveness.
Prunus lusitanica	Portuguese laurel	Moderately attractive if female. Small birds eat the fruit of this plant.
Rosa rugose	Ramanas rose	Low attractiveness.
Salvia apiana	California white sage creeper	Low attractiveness.
Sollya heterophylla (now Billardiera heterophylla)	Australian bluebell	Moderate attractiveness for some cultivars, which produce fruit.
Spiraea douglasii	Western spiraea	Low attractiveness.
Syringa vulgaris	Common lilac	Low attractiveness.
Teucrium fruticans	Bush germander	Low attractiveness.
Viburnum species	Viburnum	Depending on the species, can be highly attractive to birds. Species to avoid include *Viburnum plicatum tomentosum, V. carlesii, V. lantana,* and *V. opulus.*
Westringia fruticosa	Coast rosemary	Low attractiveness.
Xylosma congestum	Shiny xylosma	Low attractiveness.



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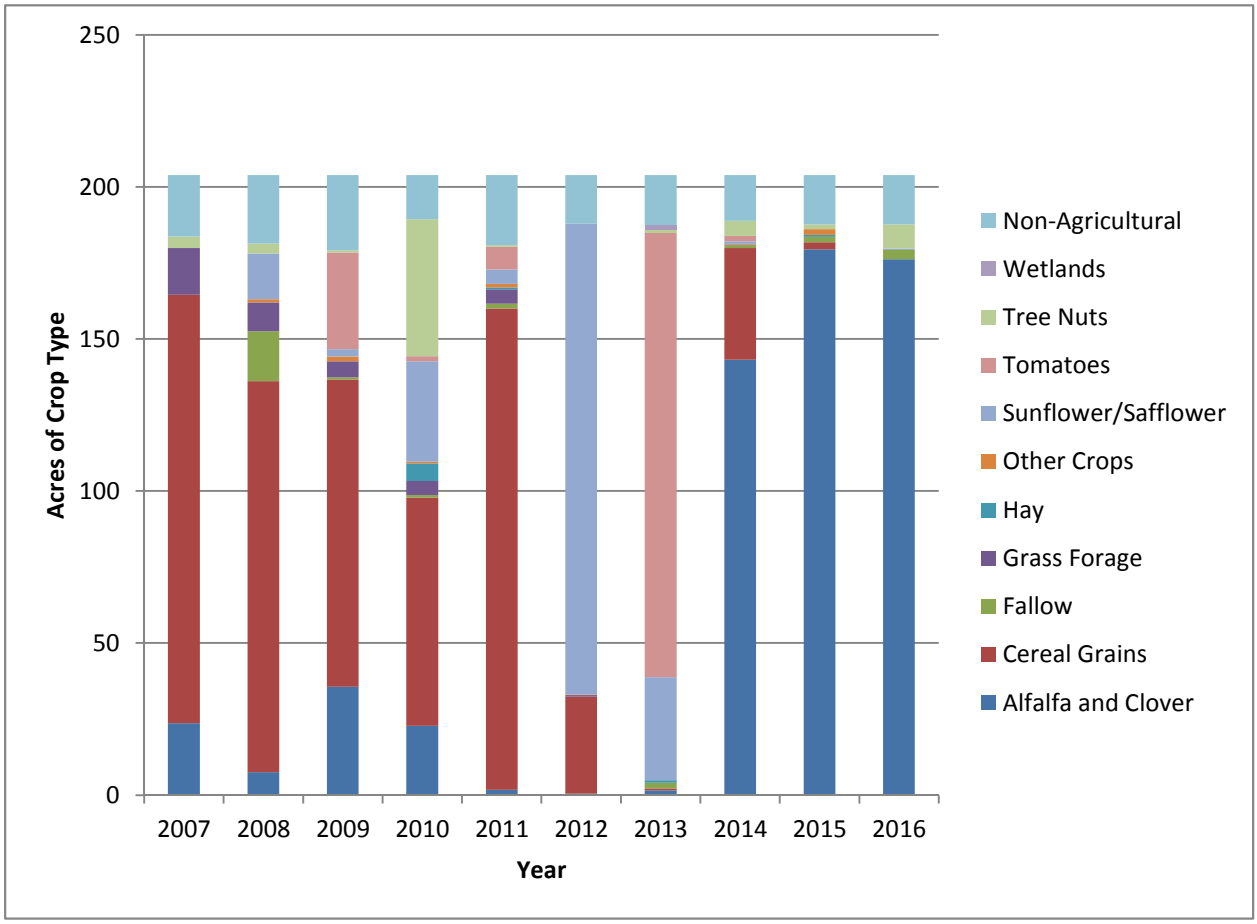
SOURCE: Bing Maps (Accessed 2017); ESA (2015)

FIGURE 1

Relationship of Project Site to the Travis Air Force Base Land Use Compatibility Plan

Wildlife Hazards Analysis for the Farm at Alamo Creek

Figure 2 Project Site Crop Types, 2007–2016



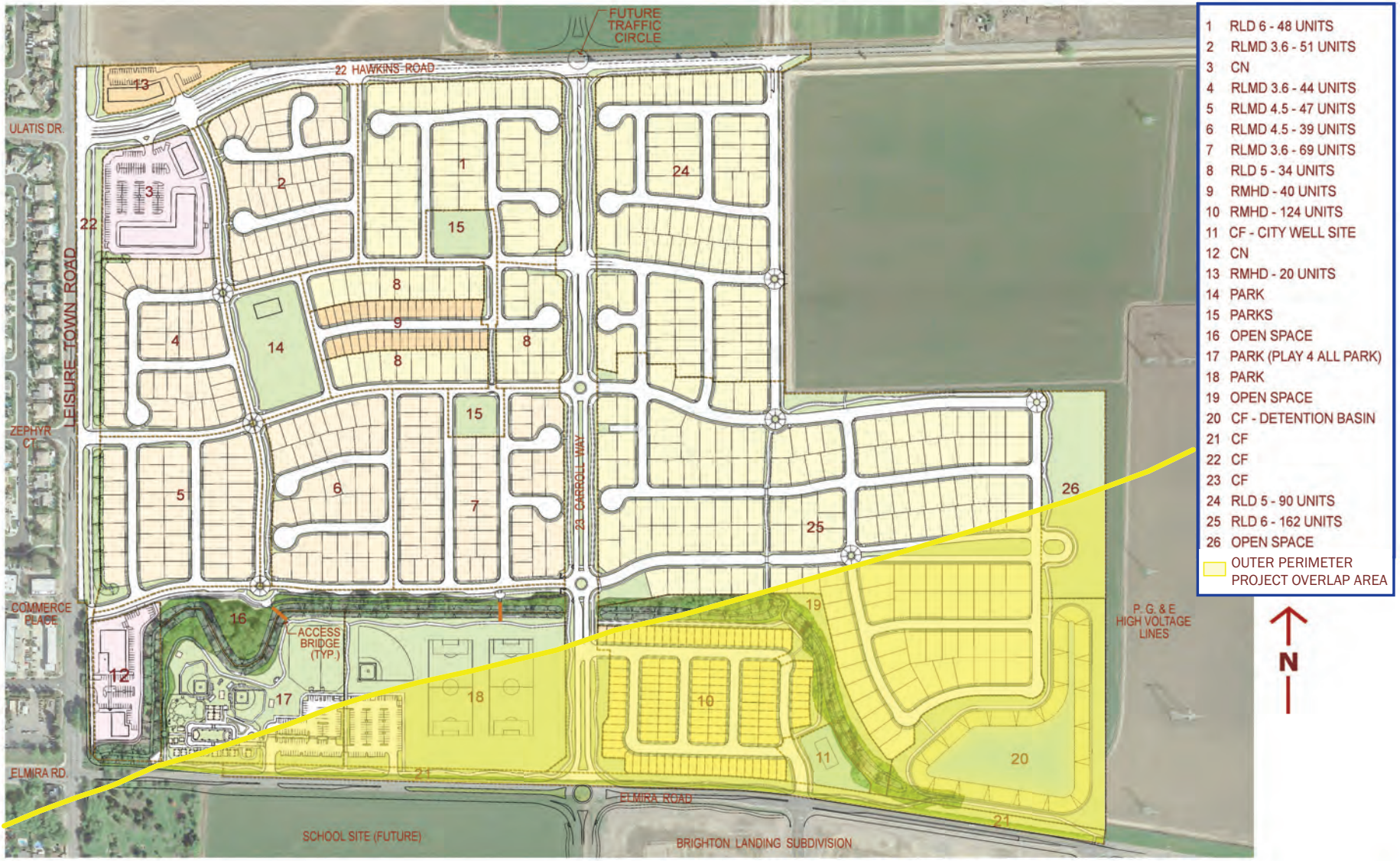


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Figure 3

Farm at Alamo Creek Land Use Plan