ENDANGERED SPECIES ACT
BIOLOGICAL ASSESSMENT
REDWOOD APARTMENTS PROJECT
3422 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

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BIOLOGICAL ASSESSMENT

1.0 INTRODUCTION

Pacific West Communities Inc. is proposing a 96-unit apartment project for a 4.11-acre site at 3422 Santa Rosa Avenue near the southern border of the City of Santa Rosa in Sonoma County, California. Project construction necessary to implement the proposed development at the site requires fill in waters of the U.S. that will require USACE Clean Water Act authorization under a Nationwide 29 permit.

This Biological Assessment has been prepared by the Huffman Broadway Group (HBG) to assess the effects of the issuance of a Nationwide 29 U.S. Army Corps of Engineers (Corps or USACE) Section 404 permit and interrelated and interdependent actions on (i) species listed as threatened or endangered under the Endangered Species Act (ESA) and (ii) species that are proposed to be listed as threatened or endangered under the ESA. Under Section 7 of the ESA, consultation by the USACE with the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries (or National Marine Fisheries Service, NMFS) is required if the proposed action may affect listed species or result in the destruction or adverse medication of designated critical habitat. The purpose of this Biological Assessment is to determine whether any listed species or designated critical habitats are likely to be adversely affected by the action and whether formal consultation is necessary. This Biological Assessment has been prepared to meet the requirements of 16 USC §1536(a)(2) and 50 CFR §402.12 for the issuance of the Section 404 permit.

The Project Site is located within the Santa Rosa Plain, which encompasses much of central Sonoma County, and is characterized by vernal pools, seasonal wetlands, and associated grasslands. These habitats support a unique population of the federally-listed endangered California tiger salamander (CTS) (*Ambystoma californiense*), and three federally-listed endangered plant species that have a large proportion of their population on the Plain. All vacant and undeveloped locations within the project area would be considered aestivation, foraging and dispersal habitat for the CTS. The three plant species are Sonoma sunshine (*Blennosperma bakeri*), Burke's goldfields (*Lasthenia burkei*), and Sebastopol meadowfoam (*Limnanthes vinculans*) and all are federally- and state-listed as endangered. All three species have potential to occur within suitable habitats in the vicinity of the project site. The Project Site is located within the area designated as critical habitat for the Sonoma County Distinct Population Segment of the CTS.

The USFWS and California Department of Fish and Wildlife (CDFW) issued guidelines for compensation for effects to listed species in the Santa Rosa Plain in the December 1, 2005 Final *Santa Rosa Plain Conservation Strategy*, the May 16, 2006 *Interim Mitigation Guidelines*, and the November 9, 2007, *Programmatic Biological Opinion for Corps Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant Species on the Santa Rosa Plain, California (Service File Number 81420-2008-F-0261 and Corps File Number 223420N*) (2007

Programmatic). Some information presented in this Biological Assessment is based on these documents.

As discussed herein, the Biological Assessment determines to what extent the Proposed Action may affect any of the endangered and threatened species that may occur in the Action Area. The Biological Assessment concludes that the Proposed Action "*is not likely to adversely affect*" the Sonoma County Distinct Population Segment of California tiger salamander and "*is not likely to adversely affect*" the three endangered plants species known to occur in the Santa Rosa Plain. The project will have "*no effect"* on critical habitat for the Sonoma County Distinct Population Segment of California tiger salamander.

2.0 DESCRIPTION OF PROJECT AND FEDERAL ACTION

2.1 Project Location

The 4.11-acre Project Site is located at 3422 Santa Rosa Avenue in the southern portion of the City of Santa Rosa, in Sonoma County, California. The site encompasses Sonoma County Assessor's Parcel Number (APN) 134-132-070. The property is within the southeast quadrant of the intersection of Santa Rosa Avenue with East Robles Avenue. Access to the site is from a driveway on East Robles Avenue. Figure 1 is a USGS map showing the location of the Project on the Santa Rosa USGS 7.5-minute quadrangle map, and Figure 2 is an aerial image of the Project Site showing current conditions and adjacent areas.

2.2 Project Purpose

The overall Project purpose is to develop an economically feasible 100% workforce housing development for families, consisting of approximately 96-units in close proximity to major transportation networks, and to fill a critical affordable residential housing shortage within Sonoma County.

2.3 Project Description

The proposed project is a 96-unit affordable housing apartment complex on a 4.11-acre parcel at 3422 Santa Rosa Avenue in the City of Santa Rosa in Sonoma County, California. The Project Site plan is shown in Figure 3. The 96 units will consist of 12 1-bedroom units that are approximately 568 square feet, 60 2-bedroom units that are approximately 761 and 799 square feet, and 24 3-bedroom units that are approximately 1,077 square feet. The development will consist of 5 buildings. Four three-story buildings will house the 96 dwelling units and one building will be the recreation/office building, which will contain a large meeting room with a full kitchen, leasing office, computer room, men's and women's restroom, fitness room and laundry room. Outside the recreation/office building, there will be a children's play area, covered American Disabilities Act (ADA) accessible picnic tables and a basketball court. The development requires a total of 180 parking spaces and will provide 180 parking spaces of which 96 will be covered parking.

The project will encompass the entire site. Implementation of the Project will include the use of heavy equipment to grade and prepare the Project site for building pads, access roads, utilities, sidewalks and landscaped areas. Access to the development would be provided from East Robles Avenue. Grading activities would result in the permanent placement of fill material (soil) into 0.25 acres of seasonal wetlands and may affect federally-listed California tiger salamander or any of three federally-listed endangered plant species. The Project will help meet the housing demand created by losses in the recent fire disaster.

2.4 The Federal Action

The implementation of the Project will require fill in wetlands and waters of the U.S. subject to the Clean Water Act Section 404 jurisdiction of the USACE. The applicant is applying for authorization to place fill in 0.25-acre of wetlands under a Nationwide 29 Department of the Army Permit.

3.0 DESCRIPTION OF THE ACTION AREA

The Action Area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The Action Area for the proposed project includes the 4.11-acre Project Site for the proposed project and the immediately surrounding area. The purpose of the project is to provide below market rate residential housing to serve the needs of Sonoma County near the City of Santa Rosa.

3.1 General Description of the Project Area

The Project Site encompasses a 4.11-acre area southeast of the intersection of Santa Rosa Avenue with East Robles Avenue. The Project Site is a currently vacant with a history of prior land uses. For several decades in the latter part of the 20th century the western half of the site adjacent to Santa Rosa Avenue supported a night club called Everybody's Talking. This portion of the site retains the pavement and disturbances left over from that prior use. The remainder of the site is vegetated with a combination of ruderal non-native species intermixed with small areas of seasonal wetlands. The Project Site is currently designated by the County of Sonoma as Urban Residential. Surrounding land uses include residential uses to the north and east of the site, undeveloped fallow land on the adjacent property to the south, and retail commercial establishments across Santa Rosa Avenue to the west of the site. An additional commercial use exists on the east side of Santa Rosa Avenue adjacent to the southwest corner of the Project Site. The area of prior disturbance including pavement for the night club use, associated parking and roadway access encompasses approximately 0.29 acres of the 4.11-acre site, entirely along the frontage of Santa Rosa Avenue.

The project area is generally level terrain with at an elevation of about 110 feet msl. Natural drainage is from east to west and a drainage ditch established along the southern border directs drainage to a culvert under Santa Rosa Avenue where is enters the City's storm drain system. Plant communities at the site are primarily non-native annual grasslands and seasonal wetlands. Based on review of the U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey, the soil type occurring on the property is Wright loam, shallow, wet, 0 to 2% slopes.

Prior biological studies have been conducted related to the Project Site including a wetland delineation (Golden Bear Biostudies 2004), a site assessment for California tiger salamander (Northen 2003) and two years (2013 and 2014) of special status plant surveys (Winfield 2014). HBG conducted a series of site investigations in 2012 and again at the property during November 2018. Objectives of these field reviews included independently verify conditions reported in previous biological studies and performing a new wetland delineation. HBG field surveys consisted of walking the parcel on foot noting: (1) plant communities present; (2) if the site provided conditions potentially suitable for special status species; or (3) if sensitive habitats (including wetlands) were present, and (4) the potential for biological impacts resulting from development of the site.

3.2 Plant Communities and Animal Populations

Vegetation communities are assemblages of plant species growing in an area of similar biological and environmental factors. Vegetation communities and habitats at the Project Site were identified based on the currently accepted List of Vegetation Alliances and Associations (or Natural Communities List) (CDFW 2010). The list is based on A Manual of California Vegetation, Second Edition (Sawyer and Keeler-Wolf 2009), which is the National Vegetation Classification applied to California. Wetland habitats on-site were further classified using the U.S. Fish and Wildlife's Service's "Classification System for Wetland and Deepwater Habitats" (Cowardian et al. 1979). The Project Site contains two habitat types according to the Natural Communities List: Non-native Grassland and Coastal Freshwater Marsh.

Vegetation within the non-native annual grassland habitat was described by Ted Winfield in his rare plant survey reports (Winfield 2014) (see Attachment 1). Common non-native grass species include slender oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), ryegrass (*Festuca perennis*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), foxtail fescue (*Festuca myuros*) and Harding grass (*Phalaris aquatica*). Common herbaceous plants include chicory (*Cichorium intybus*), rough cat's-ear (*Hypochaeris radicata*), prickly lettuce (*Lactuca serriola*), bristly ox-tongue (*Helminthotheca echioides*), salsify (*Tragopogon porrifolius*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativa*), filaree (*Erodium botrys, E. cicutarium*), vetch (*Vicia sativa*), bur clover (*Medicago polymorpha*), and Himalayan blackberry (*Rubus armeniacus*). Other common ruderal species were observed by HBG during the November 2018 field reconnaissance including yellow star thistle (*Centaurea solstitialis*), field bindweed (*Convolvulus arvensis*), sweet fennel (*Foeniculum vulgare),* English plantain (*Plantago lanceolata*), and horseweed (*Conyza canadensis*). Several Coast live oaks (*Quercus agrifolia*) and valley oaks (*Quercus lobata*) can be found in the northeast corner of the site and three Coast live oaks and a single walnut (*Juglans* sp.) are in the southwest corner.

Portions of the site consist of a Coastal Freshwater Marsh community made up of plant species that are adapted for life in ponded or saturated soil conditions. The Coastal Freshwater Marsh community consists of seasonal wetlands that are ponded or saturated during the winter wet season. Golden Bear Biostudies (2004) estimated 0.35 acres of wetlands were present; recent studies by HBG found wetlands encompassing an area of 0.25 acres (see Section 3.3). Winfield (2014) described the vegetation in the wetlands to include species such as Mediterranean barley, California semaphore grass (*Pleuropogon californicus*), meadow barley (*Hordeum brachyantherum*), rabbit's-foot grass (*Polypogon monspeliensis*), dense sedge (*Carex densa*), spike rush (*Eleochris macrostachya*), brown-headed rush (*Juncus phaeocephalus*), curly dock (*Rumex crispus*), pennyroyal (*Mentha pulegium*), prickle-seeded buttercup (*Ranunculus muricatus*), and hyssop loosestrife (*Lythrum hyssopifolium*). HBG also noted considerable amounts of coyote thistle (*Eryngium* sp.) in the larger wetland along the eastern boundary during the November 2018 field reviews.

The Non-native Grassland and Coastal Freshwater Marsh habitats onsite support a variety of wildlife species that would be expected in a ruderal field or grassland habitat with interspersed

marsh in an otherwise disturbed area on the Santa Rosa plain. The complex of habitats includes shrubs and groundcover vegetation which provide nesting and roosting sites for birds, in addition to foraging areas for species of mammals, reptiles, amphibians and birds, and the wetlands provide a seasonal source of water as well as cover and shelter for various animal species. Animal species noted during field surveys conducted by an HBG wildlife biologist in November 2018 included bird species such as red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), American crow (*Corvus brachyrhynchos*), northern flicker (*Colaptes auratus*), Say's phoebe (*Sayornis saya*), black phoebe (*Sayornis nigricans*), white-crowned sparrow (*Zonotrichia leucophrys*), Brewer's blackbird (*Euphagus cyanocephalus*), American goldfinch (*Spinus tristis*), and house finch (*Haemorhous mexicanus)*. Also noted by HBG were western fence lizard (*Sceloporus occidentalis*) and dens of Botta's pocket gopher (*Thomomys bottae*). Other wildlife using the site would include species adapted to urban environments such as Virginia opossum (*Didelphis virginiana*), deer mouse (*Peromyscus maniculatus*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), black-tailed jackrabbit (*Lepus californicus*), striped skunk (*Mephitis mephitis*) and raccoon (*Procyon lotor*). Amphibians and reptiles such as Pacific treefrog (*Pseudacris regilla*) and Pacific gopher snake (*Pituophis catenifer)* are also likely present.

3.3 Preliminary Wetland Delineation

A preliminary wetland delineation was conducted by Golden Bear Biostudies in 2004 (Golden Bear Biostudies 2004) (see Attachment 2) that described the wetlands as encompassing an area of approximately 0.35 acres. HBG re-verified the 2004 delineation in 2012. Because of the passage over approximately 6 years, a new preliminary jurisdictional delineation was conducted by HBG in November of 2018. Wetland status and boundaries were determined using methods for routine on-site determinations consistent with those specified in the Interim Regional Supplement (Arid West Region) to the U.S. Army Corps of Engineer's 1987 wetland delineation manual. Based on the more recent delineation, the project site contains 0.25 acre of seasonal wetlands, mostly in low-lying topography at the eastern end of the property. The reduction of wetland area was due to the use of GPS technology to more accurately map and measure wetland area and a vegetaion shift over time to a prevalence of harding grass. The location of the wetlands present on the property is shown in Figure 4.

3.5 Federally-listed Species

The Project Site is located within the Santa Rosa Plain, which encompasses much of central Sonoma County, and is characterized by vernal pools, seasonal wetlands, and associated grasslands. These habitats support a unique population of the federally-listed endangered California tiger salamander (*Ambystoma californiense*), and three federally-listed endangered plant species that have a large proportion of their population on the Plain. All vacant and undeveloped locations within the Project Site would be considered aestivation, foraging and dispersal habitat for the CTS. The three plant species are Sonoma sunshine (*Blennosperma bakeri*), Burke's goldfields (*Lasthenia burkei*), and Sebastopol meadowfoam (*Limnanthes*

vinculans), all three federally- and state-listed as endangered. All three species have potential to occur on the Project Site and all three are known to occur in the project vicinity.

Critical habitat was designated for the CTS in Sonoma County as published in the Federal Register on August 31, 2011. The Project Site is within the area designated as critical habitat for the Sonoma County Distinct Population Segment of the CTS.

Under the Programmatic Biological Opinion, seasonal wetlands such as those present on the Project Site and that are within the range of the three listed plant species are considered suitable habitat for the listed plants even if intensive surveys fail to locate their presence. This provision is necessary because seed banks are often persistent; some plant species may not produce seedlings for many years until conditions are appropriate. Suitable habitat for the federally-listed threatened California red-legged frog (*Rana draytonii*) does not occur on the Project Site or in the vicinity.

The *Santa Rosa Plain Conservation Strategy* and the *2007 Programmatic Biological Opinion* (*Programmatic Biological Opinion for U.S. Army Corps of Engineers Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant Species on the Santa Rosa Plain, California*) were crafted during the period from 2005-2007 by the USFWS, CDFW, and interested stakeholders to allow some development to continue, and to specifically preserve habitat for the three listed plant and animal species.

4.0 THREATENED AND ENDANGERED SPECIES AND DESIGNATED CRITICAL HABITAT

Rare, endangered, or threatened species are protected by the Federal Endangered Species Act of 1973 (16, USC §§ 1531 et seq.), the California Native Plant Protection Act of 1977 (Fish and Game Code §§1900-1913), and the California Endangered Species Act of 1970 (Fish and Game Code, §§2050 et seq.). The California Environmental Quality Act (CEQA) (Public Resources Code §§21000 et seq.) provides additional protection for unlisted species that meet the rare or endangered criteria defined in Title 14, California Code of Regulations, § 15380.

CDFW maintains records for the distribution and known occurrences of "sensitive" species and habitats in the California Natural Diversity Database (CNDDB). Sensitive species include those species listed by the federal and state governments as endangered, threatened, or established by the USFWS, NMFS or CDFW as rare or candidate species. The CNDDB is organized into map areas based on 7.5-minute topographic maps produced by the U.S. Geological Survey. All known occurrences of sensitive species and important natural communities are mapped onto the quadrangle map. The database gives further detailed information on each occurrence, including the specific location of the individual, population, or habitat (if possible) and the presumed current state of the population or habitat.

4.1 Species Evaluated

The Project Site is located within the Santa Rosa Plain, which encompasses much of central Sonoma County, and is characterized by vernal pools, seasonal wetlands, and associated grasslands. These habitats support a unique population of the federally-listed endangered California tiger salamander (*Ambystoma californiense*), and three federally-listed endangered plant species that have a large proportion of their population on the Plain. All vacant and undeveloped locations within the Project Site would be considered aestivation, foraging and dispersal habitat for the CTS, which is also listed as a threatened species under the California Endangered Species Act. The three plant species are Sonoma sunshine (*Blennosperma bakeri*), Burke's goldfields (*Lasthenia burkei*), and Sebastopol meadowfoam (*Limnanthes vinculans*), all three federally- and state-listed as endangered. All three species have potential to occur within suitable habitats in the vicinity of the project site, and two, Sonoma sunshine and Sebastopol meadowfoam, are known to occur in the project vicinity. Under the Programmatic Biological Opinion (USFW 2007), seasonal wetlands such as those present on the Project Site and that are within the range of the three listed plants species are considered suitable habitat for the listed plants even if intensive surveys fail to locate their presence. The Project Site is located within the area designated as critical habitat for the Sonoma County Distinct Population Segment of the CTS.

Suitable habitat may also be present in the vicinity of the Project Site for a federally-listed plant species that is not included among those species covered by the *Santa Rosa Plain Conservation*

Strategy. Contra Costa goldfields (*Lastenia conjugens*) are an annual member of the sunflower family (*Asteraceae*) that occur in mesic valley and foothill grasslands, vernal pools, and playas in many Bay Area counties. Contra Costa goldfields is a federally-listed endangered species with designated critical habitat and a recovery plan. None of the nine critical habitat units for this species are in Sonoma County. The closest units are in southern Mendocino County and southern Napa County. There are no records of Contra Costa goldfields anywhere within ten miles of the Project Site. Most of the records are from deltaic areas of the Sacramento Valley within Napa, Solano and Contra Costa Counties, where the critical habitat units are located. Contra Costa goldfields is unlikely to occur within the Project Site or within the action area.

4.2 Santa Rosa Plain Conservation Strategy

4.2.1 Nature of the Program

The *Santa Rosa Plain Conservation Strategy* (Conservation Strategy) was developed by a team of representatives (Conservation Strategy Team) from the USFWS, USACE, US EPA, CDFW, Sonoma County, local cities, NCRWQCB, local governmental agencies, the Laguna de Santa Rosa Foundation, the environmental community, and the private landowner community. The Conservation Strategy is limited to the Santa Rosa Plain which is located in central Sonoma County, bordered on the south and west by the Laguna de Santa Rosa, on the east by the foothills, and on the north by the Russian River.

The purpose of the Conservation Strategy is threefold: (1) to establish a long-term conservation program sufficient to compensate potential adverse effects of future development on the Santa Rosa Plain, and to conserve and contribute to the recovery of the California tiger salamander and a select group of listed plants (Sonoma sunshine, Burke's goldfields, Sebastopol meadowfoam, and many-flowered navarretia [*Navarretia leucocephala* ssp. *Plieantha*]) and the conservation of their sensitive habitat; (2) to accomplish the preceding in a fashion that protects stakeholders' (both public and private) land use interests, and (3) to support issuance of an authorization for incidental take of California tiger salamanders and listed plants that may occur in the course of carrying out a broad range of activities on the Santa Rosa Plain.

The Conservation Strategy provides the biological basis for a permitting process for projects that are in the potential range of listed species on the Santa Rosa Plain. This is intended to provide consistency, timeliness and certainty for permitted activities. The Conservation Strategy study area is comprised of the potential California tiger salamander range and the listed plant range within the Santa Rosa Plain. The Conservation Strategy establishes interim and long-term mitigation requirements and designates conservation areas where compensation will occur. It describes how preserves will be established and managed. It also includes guidelines for translocation, management plans, adaptive management and funding.

The USFWS and CDFW have issued guidelines for compensation for effects to listed species in the Santa Rosa Plain in the December 1, 2005 Final *Santa Rosa Plain Conservation Strategy* (USFWS 2005) and the November 9, 2007, *Programmatic Biological Opinion for Corps Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant*

Species on the Santa Rosa Plain, California (Service File Number 81420-2008-F-0261 and Corps File Number 223420N) (2007 Programmatic) which was based on the Conservation Strategy. The USFWS will also prepare a recovery plan for the Sonoma County Distinct Population Segment of the California tiger salamander and listed plants as required by the Act. The Conservation Strategy will be the foundation of the recovery plan.

The *Santa Rosa Plain Conservation Strategy* has not officially been approved by the agencies as of the date of this Biological Assessment.

4.2.2 Conservation Strategy Designations in the Project Site Vicinity

The map in Figure 3 of the Santa Rosa Plain Conservation Strategy (dated April 16, 2007) and Enclosure 1 (the most current, dated February 5, 2008) provides the Conservation Strategy designations for areas within the Santa Rosa Plain. The entire Project Site is noted in the Santa Rosa Plain Conservation Strategy with the following designation "may adversely affect listed plants and/or CTS." The Conservation Strategy designations for the site and the general site vicinity are reproduced in Figure 5.

4.2.3 Mitigation Requirements for Listed Species

The Conservation Strategy identifies the mitigation requirements for CTS, listed plants, and seasonal wetlands. The mitigation requirements included in the Conservation Strategy will contribute to conservation and recovery of the listed species and their sensitive habitat when implemented.

Mitigation requirements for development projects that impact CTS were developed under the Conservation Strategy and are detailed in the 2007 USFWS Programmatic Biological Opinion, which specifies mitigation requirements for effects to CTS in the Santa Rosa Plain. The Programmatic Biological Opinion requires mitigation at a ratio of 3:1 for projects that are within 500 feet of a breeding site; 2:1 for projects that are greater than 500 feet and within 2200 feet of a known breeding site, and projects beyond 2200 feet from a known breeding site but within 500 feet of an adult occurrence; and 1:1 for projects that are greater than 2200 feet and within 1.3 miles of a known breeding site. Mitigation of 0.2:1 is required for projects in areas more than 1.3 miles from a breeding site shown on Figure 3 of the Conservation Strategy, and in this case may be provided by a monetary contribution to a species fund overseen by USFWS and/or CDFW. A project proponent may choose to survey to determine CTS presence rather than mitigate. In the event CTS is found, CTS mitigation shall be as outlined above. If no CTS is found, no CTS mitigation will be required.

The Conservation Strategy also includes a provision for how CTS mitigation will be treated in the absence of Conservation Strategy approval. Prior to implementation of the Conservation Strategy, USFWS and CDFW will continue to apply the interim mitigation guidelines as described in the letter dated June 29, 2005 from USFWS and CDFW to the local agencies. Such interim mitigation shall apply to all projects, including linear projects, and mitigation for CTS will be required for all projects within 1.3 miles of known breeding sites. The existing programmatic

biological opinion for listed plants will also be applied. During this interim period, the following mitigation ratios will be applied: (1) mitigation of 3:1 for projects that are within 500 feet of a known breeding site: (2) mitigation of 2:1 for projects that are greater than 500 feet, and within 2,200 feet of a known breeding site, and for projects beyond 2200 feet from a known breeding site, but within 500 feet of an adult occurrence; and (3) mitigation of 1:1 for projects that are greater than 2200 feet, and within 1.3 miles of a known breeding site

The Programmatic Biological Opinion mitigation ratios for listed plants species on the Santa Rosa Plain are based on the presence of suitable versus occupied habitat, and the potential for presence of Burke's goldfields and Sonoma sunshine; or Sebastopol meadowfoam (USFWS 2007). The site is considered to be occupied if surveys conducted using the USFWS protocol determined presence of the plants or if the site had listed plants in the past. Protocol botanical inventories for federal listed plants on the Santa Rosa Plain consist of a minimum of three site visits per year and a minimum of two years of negative survey data within three years of project proposal submission to substantiate a negative finding. Under the Programmatic Biological Opinion, seasonal wetlands such as those present on the study site and that are within the range of the three listed plants species are considered suitable habitat for the listed plants even if intensive surveys fail to locate their presence. This provision is necessary because seed banks are often persistent; some plant species may not produce seedlings for many years until conditions are appropriate.

Mitigation requirements of the *Santa Rosa Plain Conservation Strategy* and the Programmatic Biological Opinion (USFWS 2007) are summarized in the Table below:

Table 1. Mitigation Requirements as Per the Santa Rosa Plain Conservation Strategy and Programmatic Biological Opinion

Impact to:	**Occupied Habitat Compensation:**	**Suitable Habitat Compensation:**
Burke's goldfields OR Sonoma sunshine	3:1 occupied or established habitat (any combination) with success criteria met prior to ground-breaking at project site	1:1 occupied or established habitat (any combination) with success criteria met prior to groundbreaking at project site AND 0.5:1 established habitat with success criteria met prior to groundbreaking at project site
Sebastopol meadowfoam	2:1 occupied or established habitat (any combination) with success criteria met prior to ground-breaking at project site	1:1 occupied or established habitat (any combination) with success criteria met prior to groundbreaking at project site AND 0.5:1 established habitat with success criteria met prior to groundbreaking at project site

According to the Programmatic Biological Opinion (USFWS 2007), mitigation for impacts to occupied and suitable habitat will consist of preserving occupied sites or established sites with the same impacted species. Sites with suitable habitat are sites that have not been observed to flower during botanical surveys but may have viable seeds in the soil and have additional biological, hydrological and topographic attributes necessary to support the species. Impacts to suitable habitat north of Santa Rosa Creek will mitigate with occupied or established Burke's goldfields or Sonoma sunshine. Impacts to suitable habitat south of Santa Rosa Creek will mitigate with Burke's goldfields, Sonoma sunshine or Sebastopol meadowfoam. Mitigation of occupied and suitable habitat will minimize the effects to the listed plants by ensuring sites will support the species. Adaptive management plans and endowment funding will also increase the probability of the plant populations to be viable in the long term and will be protected in perpetuity through a conservation easement or similar instrument.

Other required mitigation components include management plans, long-term endowments, and other necessary requirements, all of which must be complete and approved by the USFWS and CDFW. Preserve enhancement or management associated with permits and enforcement actions that are appended to the Programmatic Biological Opinion will be provided individual take authorization. It is anticipated that ground work associated with enhancing a Preserve will generally have a net benefit to the California tiger salamander and/or listed plants and would not need to adhere to the mitigation ratios. This Biological Assessment incorporates all applicable requirements of the *Santa Rosa Plain Conservation Strategy* and the 2007 Programmatic Biological Opinion as mitigation for Project effects on covered species.

4.3 Status of the Species

Information on the status of the species discussed below is primarily taken from Status Reviews of the various species published by the USFWS every five years, including a recent update for the Sonoma Population of California tiger salamander and Status Reviews for the three plant species last updated and published in 2008.

4.3.1 California Tiger Salamander

Listing Status: The Sonoma County Distinct Population Segment of the California tiger salamander was emergency listed as endangered on July 22, 2002 (USFWS 2002). The salamander was listed as endangered on March 19, 2003 (USFWS 2003). The California tiger salamander was listed as threatened on August 4, 2004 (USFWS 2004). This latter listing changed the status of the Santa Barbara and Sonoma County populations from endangered to threatened. On August 10, 2004, the USFWS proposed 47 critical habitat units in 20 counties. No critical habitat was proposed for Sonoma County. On October 13, 2004, a complaint was filed in the U.S. District Court for the Northern District of California (Center for Biological Diversity and Environmental Defense Council v. U.S. Fish and Wildlife Service *et al*.). On February 3, 2005, the District Court required the USFWS to submit for publication in the *Federal Register*, a final determination on the proposed critical habitat designation on or before December 1, 2005. On August 2, 2005, the USFWS noticed in the *Federal Register* a proposed

critical habitat designation (USFWS 2005a). On August 19, 2005, a court order was filed on the above complaint, which upheld the Section 4(d) rule exempting grazing from Section 9 prohibitions but vacated the downlisting of the Santa Barbara and Sonoma populations and reinstated their endangered distinct population segment status. On December 14, 2005, (USFWS 2005b), the USFWS made a final determination to designate and exclude approximately 17,418 acres of critical habitat for the Sonoma population. All critical habitat was excluded based on interim conservation strategies and measures being implemented by those local governing agencies with land use authority over the area and also as a result of economic exclusions authorized under section 4(b)(2) of the Act. Therefore, no critical habitat was designated for the Sonoma County Distinct Population Segment of the California tiger salamander in Sonoma County, California.

On October 2, 2008, a complaint was filed in the U.S. District Court for the Northern District of California (Center for Biological Diversity and Environmental Defense Council v. U.S. Fish and Wildlife Service *et al*.). The complaint claimed, in part, that the determination to exclude critical habitat was based on the local jurisdictions on fully implementing the Santa Rosa Plain Conservation Strategy and that the local jurisdictions have abandoned their efforts to do so. On May 5, 2009, the Court approved a stipulated settlement agreement in which the USFWS agreed to publish a revised proposed rule within 90 days that encompassed the same geographic area as the August 2005 proposal. The proposed rule that was published in the *Federal Register* on August 18, 2009 (74 FR 41662), complies with the May 5, 2009, stipulated agreement. The USFWS also agreed in the May 5, 2009, stipulated settlement agreement to submit a final rule to the *Federal Register* on or before July 1, 2011. On June 9, 2011, the Court approved an extension to submit a final rule to the *Federal Register* on or before September 1, 2011. On August 31, 2011, the USFWS published a final rule in the *Federal Register* (76 FR 169) to designate revised critical habitat for the Sonoma County distinct population segment of the California tiger salamander. In total, approximately 47,383 acres (19,175 hectares) of land were designated as revised critical habitat within the Santa Rosa Plain Unit for the Sonoma County Distinct Population Segment of the California tiger salamander.

Description: The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (Petranka 1998). Tiger salamanders exhibit sexual dimorphism with males typically larger than females. The coloration of the California tiger salamander is white or yellowish markings against black. Adult California tiger salamanders usually have creamy yellow to white spotting on the sides and reduced spotting on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the dorsal surface. California tiger salamander larvae have yellowish gray bodies, broad fat heads, large feathery external gills, and broad dorsal fins extending well up their back and range in length from approximately 0.45 to 0.56 inches (Petranka 1998).

Distribution: Historically, the California tiger salamander inhabited low elevation grassland and oak savanna plant communities of the Central Valley, and adjacent foothills, and the inner Coast Ranges in California (Jennings and Hayes 1994; Storer 1925; Shaffer *et al*. 1993). The

species has been recorded from near sea level to approximately 3,900 feet in the Coast Ranges and to approximately 1,600 feet in the Sierra Nevada foothills (Shaffer *et al*. 2004). Along the Coast Ranges, the species occurred from the Santa Rosa area of Sonoma County, south to the vicinity of Buellton in Santa Barbara County. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County.

The Sonoma County Distinct Population Segment of the California tiger salamander is discrete in relation to the remainder of the species and encompasses all of Sonoma County. The population is geographically isolated and separate from other California tiger salamanders. The Sonoma County population is widely separated geographically from the closest populations, which are located in Contra Costa, Yolo, and Solano counties. These populations are separated from the Sonoma County population by the Coast Range, Napa River, and the Carquinez Straits, at a minimum distance of approximately 45 miles. Documented occurrences of the Sonoma California tiger salamander are primarily concentrated in the Santa Rosa Plain. There are no known records of the California tiger salamander in the intervening areas (D. Warenycia, California Department of Fish and Game, personal communication with the Service, 2002). The USFWS has no evidence of natural interchange of individuals between the Sonoma County population and other California tiger salamander populations.

The Sonoma County Distinct Population Segment of the California tiger salamander inhabits low-elevation (below 500 feet) vernal pools and seasonal ponds, associated grassland, and oak savannah plant communities. The historic range of the Sonoma County population also may have included the Petaluma River watershed, as there is one historic record of a specimen from the vicinity of Petaluma from the mid-1800s (Borland 1856, as cited in Storer 1925).

Natural History: The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al*. 2004). Although larvae salamanders develop in vernal pools and ponds in which they were born, they are otherwise terrestrial salamanders and spend most of their postmetamorphic lives in widely dispersed underground retreats (Shaffer *et al*. 2004; Trenham *et al*. 2001). Subadult and adult California tiger salamanders spend the dry summer and fall months of the year in the burrows of small mammals, such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). Because they live underground in small mammal burrows, California tiger salamanders are rarely encountered in the uplands by humans even where they are abundant.

California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Burrows often harbor camel crickets (*Ceuthophilus* spp. and *Pristoceuthophilus* spp.) and other invertebrates that provide likely prey for California tiger salamanders. Underground refugia also provide protection from the sun and wind associated with the dry California climate that can cause excessive drying of amphibian skin. Although tiger salamanders are members of the Family *Ambystomatidae* (mole salamanders), also known as "burrowing salamanders," California tiger salamanders are not known to create their own

burrows in the wild, which may be due to the hardness of soils in the California ecosystems in which they are found. Tiger salamanders typically use the burrows of ground squirrels and gophers (Loredo et al. 1996; Trenham 1998a). However, pocket gophers are most often used by Sonoma California tiger salamanders in Sonoma County (D. Cook, pers. comm., 2001). California tiger salamanders depend on persistent small mammal activity to create, maintain, and sustain sufficient underground refugia. Burrows are short lived without continued small mammal activity and typically collapse within approximately 18 months (Loredo et al 1996).

The upland burrows inhabited by California tiger salamanders have often been referred to as "aestivation'' sites. However, "aestivation" implies a state of inactivity; while most evidence suggests that California tiger salamanders remain active in their underground dwellings. A recent study has found that California tiger salamanders move, feed, and remain active in their underground burrows (Van Hattem 2004). Because California tiger salamanders arrive at breeding ponds in good condition and are heavier when entering a pond than when leaving, researchers have long inferred that they are feeding while underground. Thus, "upland habitat" is a more accurate description of the terrestrial areas used by California tiger salamanders.

Once fall or winter rains begin, the salamanders emerge from the upland sites on rainy nights to feed and to migrate to the breeding ponds (Stebbins 1985 and Shaffer *et al*. 1993). Adult salamanders mate in the breeding ponds, after which the females lay their eggs in the water (Twitty 1941; Shaffer *et al*. 1993; Petranka 1998). Historically, California tiger salamanders utilized vernal pools, but the animals also currently breed in livestock stock ponds. Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). In ponds with no or limited vegetation, they may be attached to objects, such as rocks and boards on the bottom (Jennings and Hayes 1994). After breeding, adults leave the pool and return to the small mammal burrows (Loredo *et al*. 1996; Trenham 1998a), although they may continue to come out nightly for approximately the next two weeks to feed (Shaffer *et al*. 1993). In drought years, the seasonal pools may not form, and the adults cannot breed (Barry and Shaffer 1994).

California tiger salamander larvae typically hatch within 10 to 24 days after eggs are laid (Storer 1925). The peak emergence of these metamorphs is typically between mid-June to mid-July (Loredo and Van Vuren 1996; Trenham et al 2000) but in some areas as early as late February or early March. The larvae are totally aquatic. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume the tadpoles of Pacific treefrogs (*Pseudacris regilla*), western spadefoot toads (*Spea hammondii*) and California red-legged frogs (*Rana aurora*) (J. Anderson 1968; P. Anderson 1968). California tiger salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, larvae often rest on the bottom in shallow water, but are also found throughout the water column in deeper water. Young salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925).

The larval stage of the California tiger salamander usually last three to six months, as most seasonal ponds and pools dry up during the summer (Petranka 1998). Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Individuals collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left the breeding pools 60 to 94 days after the eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. The longer the ponding duration, the larger the larvae and metamorphosed juveniles are able to grow, and the more likely they are to survive and reproduce (Pechmann *et al*. 1989; Semlitsch *et al*. 1988; Morey 1998; Trenham 1998b). The larvae will perish if a site dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al*. (1989) found a strong positive correlation with ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, California, Feaver (1971) found that only 11 of 30 pools sampled supported larval California tiger salamanders, and five of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only six (20 percent) provided suitable conditions for successful reproduction that year.

Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al*. 1988; Scott 1994; Morey 1998). In the late spring or early summer, before the ponds dry completely, metamorphosed juveniles leave them and enter upland habitat. This emigration occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al*. 1996). Unlike during their winter migration, the wet conditions when adult California tiger salamanders typically prefer do not generally occur during the months when their breeding ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under these conditions, they may move only short distances to find temporary upland sites for the dry summer months, waiting until the next winter's rains to move further into suitable upland refugia. Once juvenile California tiger salamanders leave their birth ponds for upland refugia, they typically do not return to ponds to breed for an average of 4 to 5 years (Trenham *et al.* 2000). However, they remain active in the uplands, coming to the surface during rainfall events to disperse or forage (Trenham and Shaffer 2005).

Lifetime reproductive success for California and other tiger salamanders is low. Trenham *et al*. (2000) found the average female bred 1.4 times and produced 8.5 young that survived to metamorphosis per reproductive effort. This resulted in roughly 11 metamorphic offspring over the lifetime of a female. Two reasons for the low reproductive success are the preliminary data suggests that most individuals of the California tiger salamanders require two years to become sexually mature, but some individuals may be slower to mature (Shaffer *et al*. 1993); and some animals do not breed until they are four to six years old. While individuals may survive for more than ten years, many breed only once, and in some populations, less than 5 percent of marked juveniles survive to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well as from human caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate

a population.

Dispersal and migration movements made by California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/ birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al*. 2001). Following breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before breeding again (Trenham *et al*. 2000).

California tiger salamanders are known to travel large distances from breeding sites into upland habitats. Maximum distances moved are generally difficult to establish for any species, but California tiger salamanders in Santa Barbara County have been recorded to disperse 1.3 miles from breeding ponds (Sweet *in litt*. 1998). California tiger salamanders are known to travel between breeding ponds; one study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at ponds approximately 1,900 and 2,200 feet away (Trenham *et al*. 2001). In addition to traveling long distances during migration to or dispersal from ponds, California tiger salamanders may reside in burrows that are far from ponds.

Although the observations above show that California tiger salamanders can travel far, typically they stay closer to breeding ponds. Evidence suggests that juvenile California tiger salamanders disperse further into upland habitats than adults. A trapping study conducted in Solano County during winter of 2002/2003 found that juveniles used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile salamanders were captured at distances of 328, 656, and 1,312 feet from breeding ponds than at 164 feet. Large numbers, approximately 20 percent of total captures, were found 1,312 feet from a breeding pond. Fitting a distribution curve to the data revealed that 95 percent of juvenile salamanders could be found within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Results from the 2003/2004 trapping efforts detected juvenile California tiger salamanders at even further distances, with a large proportion of the total salamanders caught at 2,297 feet from the breeding pond (Trenham and Shaffer, 2005). During post-breeding emigration, radio-equipped adult California tiger salamanders were tracked to burrows 62 to 813 feet from their breeding pond (Trenham and Shaffer 2005). During post-breeding emigration, radio-equipped adult California tiger salamanders were tracked to burrows 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders having depleted physical reserves post-breeding, or also due to the drier weather conditions that can occur during the period when adults leave the ponds.

In addition, rather than staying in a single burrow, most individuals used several successive burrows at increasing distances from the pond. Although the studies discussed above provide an approximation of the distances that California tiger salamanders regularly move from their

breeding ponds, upland habitat features will drive the details of movements in a particular landscape. Trenham (2001) found that radio-tracked adults favored grasslands with scattered large oaks, over more densely wooded areas. Based on radio-tracked adults, there is no indication that certain habitat types are favored as corridors for terrestrial movements. In addition, at two ponds completely encircled by drift fences and pitfall traps, captures of arriving adults and dispersing new metamorphs were distributed roughly evenly around the ponds. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Several species have either been documented to prey or likely prey upon the California tiger salamanders including coyotes (*Canis latrans*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), egrets (Egretta species), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), garter snakes (*Thamnophis* spp), bullfrogs (*Rana catesbeiana*), mosquito fish (*Gambusia affinis*), and crayfish (*Procrambus* spp.). In addition, predacious aquatic hexapods (arthropods) have also been shown to have a significant negative association with California tiger salamanders (Bobzien and DiDonato 2007). Domestic dogs (*Canis familiaris*) have been observed eating California tiger salamanders at Lake Lagunitas at Stanford University (Barry, pers. comm. 2004).

Threats: The California tiger salamander is imperiled throughout its range by a variety of human activities (USFWS 2004). Current factors associated with declining populations of the salamander include continued degradation and loss of habitat due to agriculture and urbanization, hybridization with non-native eastern tiger salamanders (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al*. 2003) and introduced predators. Hybridization with non-native eastern tiger salamanders has not yet been identified within the Sonoma County population. Fragmentation of existing habitat and agricultural activities that degrade and/or eliminate breeding pools may represent the most significant current threats to the Sonoma County Distinct Population Segment of the California tiger salamander, although populations are likely threatened by more than one factor. Isolation and fragmentation of habitats within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal and are capable of colonizing or “rescuing” extinct habitat patches). Other threats are predation and competition from introduced exotic species, various chemical contaminants, road-crossing mortality, and certain unrestrictive mosquito and rodent control operations.

Diseases may also pose a significant threat though the specific effects of disease on the California tiger salamander are not known. Pathogens, fungi, water mold, bacteria, and viruses are known to adversely affect other tiger salamander species and/or other amphibians. Pathogens are suspected of causing global amphibian declines (Davidson *et al.* 2003). Pathogen outbreaks have not been documented in the California tiger salamander, but chytrid fungus infections (chytridiomycosis) have been detected in California tiger salamander (Padgett-Flohr and Longcore 2005). Chytridiomycosis and ranaviruses are a potential threat to the California tiger salamander because these diseases have been found to adversely affect other

amphibians, including tiger salamanders (Davidson *et al*. 2003; Lips *et al*. 2003). A deformity-causing infection, possibly caused by a parasite in the presence of other factors, has affected pond-breeding amphibians at known tiger salamander breeding sites. This same infection has become widespread among amphibian populations in Minnesota and poses the threat of becoming widespread in California. Nonnative species, such as bullfrogs and nonnative tiger salamanders, are located within the range of the California tiger salamander and have been identified as potential carriers of these diseases. Human activities can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (i.e. contaminated boots or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in tiger salamanders being more susceptible to the effects of disease. Disease will likely become a growing threat because of the relatively small and fragmented remaining California tiger salamander breeding sites, the many stresses on these sites due to habitat losses and alterations, and the many other potential disease-enhancing anthropogenic changes that have occurred both inside and outside the species' range.

Critical Habitat: A final rule regarding designation of critical habitat for the Sonoma County Distinct Population Segment of the California tiger salamander in Sonoma County was issued on August 31, 2011 (USFWS 2011). The critical habitat designation included lands that were determined by USFWS to be occupied at the time of listing and contained sufficient physical and biological features to support life history processes essential for the conservation of the Sonoma California tiger salamander. A single unit was designated (the Santa Rosa Plains Unit) that contains approximately 47,383 acres, including 745 acres of State lands, 744 acres of city lands, 498 acres of county lands, 9 acres of individually owned tribal trust land, and 45,387 acres of private lands. No Federal lands were included. The unit is bordered on the west by the Laguna de Santa Rosa floodplain, on the southwest by Hensley Road, on the south by Pepper Road northwest of Petaluma, on the east generally by Petaluma Hill Road and the urban centers of Santa Rosa and Rohnert Park, and on the north by the Town of Windsor.

The unit is characterized by vernal pools, seasonal wetlands and associated grassland habitat. The critical habitat unit supports vernal pool complexes and manmade ponds that contain the primary constituent elements essential to conservation of California tiger salamander and is therefore currently known to support breeding Sonoma California tiger salamanders, upland habitat with underground refugia, and upland dispersal habitat allowing movement between occupied sites. A segment of the 100-year floodplain that is located between the Stony Point Conservation Area near Wilfred Avenue and the Northwest Cotati Conservation Area near Nahmens Road is included within the final designation to prevent fragmentation of the northern and southern breeding concentrations within the unit, by allowing for potential dispersal and genetic exchange.

4.3.2 Burke's Goldfields

Burke's goldfields was federally listed as endangered on December 2, 1991 (USFWS 1991). No critical habitat has been designated for this species.

Burke's goldfields is a slender annual herb in the aster family (*Asteraceae*). Plants are typically less than 11.8 inches in height (Hickman 1993) and usually branched (CNPS 1977). Leaves are narrow and opposite, less than two inches (5 centimeters) in length, may be entire or pinnately lobed, and with or without hairs (Ornduff 1993). Ray and disk flowers are yellow. The blooming period is variable depending on annual rainfall, but generally occurs from mid-April to mid-May, although it is known to bloom as early as mid-March and as late as mid-June (CNPS 1977; Patterson *et al*. 1994; Tibor 2001). Inflorescences have separate/free involucre bracts/phyllaries (leaf-like structures beneath the flower head). Achenes (dry, one-seeded fruits) are less than 0.06 inch in length. The achenes of Burke's goldfields can be distinguished from those of other goldfields by its pappus (parachute like appendage that aids in seed dispersal), which has one long awn (bristle) with several short scales (Ornduff 1969; Ornduff 1993). Individual Burke's goldfields plants may exhibit some geographic variation in morphology (McCarten 1985 as cited in CH2M Hill 1995; Patterson *et al*. 1994). Patterson *et al*. (1994) report robust specimens from the southern Santa Rosa Plain near the Laguna de Santa Rosa and variation in the number of awns from a Lake County population. Burke's goldfields can be distinguished from smooth goldfields (*Lasthenia glaberrima*) by the partly fused phyllaries of smooth goldfields' and its pappus (ring of scale-like or hair-like projections at the crown of an achene) of numerous narrowed or elliptical scales (Ordnuff 1993). The linear leaves without lobes and typically more than one awn distinguish common goldfields (*Lasthenia californica*) from Burke's goldfields (Ordnuff 1993).

Burke's goldfields grow in vernal pools and swales below 1640 feet (Ordnuff 1993). At the Manning Flat occurrence in Lake County, Burke's goldfields is found in a series of claypan vernal pools on volcanic ash soils (Service 1991; CNDDB 1998). At this location, the species is associated with common goldfields and few-flowered navarretia (*Navarretia leucocephala pauciflora*) (CNDDB 1998). In Sonoma County, the vernal pools containing Burke's goldfields are on nearly level to slightly sloping loams, clay loams, and clays. A clay layer or hardpan approximately two to three feet below the surface restricts downward movement of water (Service 1991). Huichica loam is the predominant soil series on which Burke's goldfields is found on the northern part of the Santa Rosa Plain (Patterson *et al*. 1994, CNDDB 1998). Huichica loam is a fine textured clay loam over buried dense clay and cemented layers (Patterson *et al*. 1994). More southerly Burke's goldfields sites likely occur on Wright loam or Clear Lake clay (Patterson *et al*. 1994; CNDDB 1998). Wright loam is a fine silty loam over buried dense clay and marine sediments. Clear Lake clay is hard dense clay from the surface to many feet thick (Patterson *et al*. 1994). Burke's goldfields sometimes occur along with Sonoma sunshine and Sebastopol meadowfoam (*Limnanthes vinculans*). These three federally listed species are all associated with other plants that commonly grow in vernal pools on the Santa Rosa Plain, including Douglas' pogogyne (*Pogogyne douglasii* spp. *parviflora*), Lobb's aquatic buttercup (*Ranunculus lobbii*), smooth goldfields, California semaphore grass (*Pleuropogon californicus*), maroonspot downingia (*Downingia concolor*), and button-celery (*Eryngium sp*.) (CNDDB 1998).

The flowers of Burke's goldfields are self-incompatible (Ornduff 1966; Crawford and Ornduff 1989) and are believed to be insect-pollinated. Specific studies on pollinators of Burke's

goldfields have not been conducted; however, evidence suggests that the same insects visit all outcrossed species of goldfields rather than concentrating on a particular species (Thorp 1976). Insects known to visit the flowers of *Lasthenia* spp. include butterflies (Lepidoptera), beetles (Coleoptera), flies (Diptera), true bugs (Hemiptera), bees, and wasps (Hymenoptera) (Thorp and Leong 1998), most of which are generalist pollinators. All the specialist pollinators of goldfields are solitary bees (family Andrenidae) (Thorp 1990) that include two species in the subgenus *Diandrena* (*Andrena submoesta* and *A. puthua*) and five or six species in the subgenus *Hesperandrena* (*Andrena baeriae, A. duboisi, A. lativentris*, and two or three undescribed species) (Thorp and Leong 1998). The extent to which pollination of Burke's goldfields depends on host-specific bees or more generalist pollinators is not currently known.

No published information exists with respect to the seed life of Burke's goldfields. Circumstantial evidence suggests that Burke's goldfields has successfully germinated from seed in soil collected from a previously developed portion of the Westwind Business Park (Building F) when the soil was translocated and deposited in created seasonal wetlands (Wilcox *in litt*. 2000). As annual species, it is expected that Burke's goldfields will respond to environmental stochastic events, such as changes in vegetative composition, climate, and disturbance, by partial germination of its seed bank. Seed banks are of importance to annual plant species subject to uncertain or variable environmental conditions (Parker *et al*. 1989; Templeton and Levin 1979). Baskin and Baskin (1998) indicate that species (annuals) adapted to "risky environments" produce persistent seed banks to offset years of low reproductive success and to ensure the species can persist at a site without immigration. These characteristics can be attributed to Burke's goldfields. Considering the adaptations of these plants to a variable Mediterranean climate it is likely the seed of Burke's goldfields can persist as dormant embryos for an undetermined number of years. Although formal studies of seed viability have not been conducted for this species, it is reasonable to expect their seed banks may persist for extended periods without germination until conditions are favorable; therefore, some occurrences may persist undetected for a number of years. Furthermore, it is not unlikely that the individual fruits of Burke's goldfields may be predisposed to variable germination requirements as a strategy for survival.

According to Rice (1989) in some vegetative communities there is a distinct difference between above and belowground plant diversity and a census of aboveground flora may not accurately reflect the total number of species present at a site. Population sizes of California's vernal pool/swale annual plant species, including Burke's goldfields, may fluctuate substantially between very high numbers in some years to very small numbers, or even absence in other years because of varying environmental conditions. Therefore, extirpation, based on only a few surveys, cannot be assumed based only on absence of above-ground plants for some species. Furthermore, declines in population size over a few years may not necessarily indicate that habitat is unsuitable (Given 1994), merely that environmental conditions within a vernal pool or swale have not favored seed germination.

Burke's goldfields are endemic to the central California Coastal Range region and have been reported historically from Mendocino, Lake, and Sonoma counties (CNPS 1977; Patterson *et al*.

1994). The number of historic occurrences (noted as populations and sites in some references) is unclear and has been reported differently by various authors. For several decades, the only reported occurrence was the type locality in Mendocino County, reported in 1886. Ornduff (1969) noted *L. burkei* is known from "several populations" north of San Francisco Bay in the Coast Ranges. Later Ornduff (1976) reported the species was infrequently collected and was "restricted to a few populations." Waaland and Vilms (1989) surveyed 84 sites on the Santa Rosa Plain and noted 33 *L. burkei* occurrences and five additional sites where the species appeared to have been extirpated. CH2MHill (1995) noted 85 populations and cited Patterson *et al.* (1994) as the source. However, while Patterson *et al*. (1994) referenced 85 sites, they noted these sites comprised "approximately 18 biological populations." In 2006, genetic material was collected from 2 occurrences of *L. burkei* in Lake County and 13 in Sonoma County to evaluate the genetic relationship between the occurrences (Ayres and Sloop *in litt.* 2008). As of 2008, the California Natural Diversity Database (CNDDB) (2008) had 32 total occurrences (occurrences 1 – 34). Some CNDDB occurrences are comprised of multiple discreet polygons and may have been counted as separate populations at one time or another, for example occurrence 9 was combined with 7 and 20 was combined with 19. All references in this document to occurrence numbers are CNDDB occurrence number for that species.

The type locality of Burke's goldfields (occurrence 5) is the only known occurrence from Mendocino County, but has not been observed at this location for decades; however, its status is uncertain because the exact location of the site is unclear. Two occurrences are recorded from Lake County, one at Manning Flat (occurrence 6) and one at a winery on Highway 29 (occurrence 11) (Ornduff 1966; CNPS 1977, Patterson *et al.* 1994). Both Lake County occurrences were extant as of 2006 (Ayres and Sloop *in litt.* 2008). According to the CNDDB (2008) the occurrence at Manning Flat had more than 100 individuals in 1999 and an unspecified number in 2002, while the winery occurrence had an estimated 10,000 individuals in 2002. The remaining occurrences are from Sonoma County (CNDDB 2008). Within Sonoma County, one occurrence is known from north of Healdsburg (Patterson *et al*. 1994; CNDDB 2008) near Lytton (occurrence 30). The last known population estimate of this occurrence was in 1990 with 300 plants observed (CNDDB 2008). Formerly well-represented (occurrences 4, 12, and 18) in the vicinity of Windsor, Burke's goldfields has now been nearly extirpated from the area (Patterson *et al*. 1994; CH2M Hill 1995); however, plants have been recently observed at one location (occurrence 12) (Ayres and Sloop *in litt.* 2008). On the Santa Rosa Plain, Burke's goldfields is distributed primarily in the northwestern and central areas with two additional occurrences south of Highway 12 near the Laguna de Santa Rosa (CH2M Hill 1995). The core of the current range of Burke's goldfields is in the Santa Rosa Plain. Of the 32 known occurrences of Burke's goldfields listed in the CNDDB, 28 are presumed to remain extant. Four historical occurrences are believed to be extirpated (occurrences 2-4 and 29), all of which are in Sonoma County. However, Ayres and Sloop (*in litt.* 2008) stated 20 populations were still extant. Of these 20, 11 are located in conservation banks and 9 are believed to be natural occurrences (C. Sloop Laguna de Santa Rosa Foundation, personal communication 2008). Four of the largest known occurrences are in Sonoma County (occurrences 10, 11, 24, and 25). The largest occurrence is along Alton Road (occurrence 25) and had between 300,000 and 1,500,000 plants in 2002 (CNDDB 2008).

1991 to 1998: Patterson *et al*. (1994) evaluated known Burke's goldfields sites on the Santa Rosa Plain, categorizing them as (1) in public ownership, (2) presumed extant and privately owned, and (3) extirpated or largely destroyed. Their data indicate that 33 percent of the acreage of known Santa Rosa Plain Burke's goldfields sites has been severely degraded or extirpated. As of 1998, the USFWS was aware of at least a dozen specific instances where ditching, draining, disking, or overgrazing occurred on parcels containing Burke's goldfields. In many cases, the number of plants at those sites declined after the disturbance took place. In addition, the Service was aware of at least four instances of unauthorized disking that triggered Corps enforcement actions for sites where Burke's goldfields grew. Because of typically small parcel size, development projects that have proceeded since listing, such as the Cobblestone and TMD Brown developments, have mitigated Burke's goldfields losses entirely off site. The few sites where plants were avoided in the course of development have failed to sustain viable populations (USFWS files).

The portion of Burke's goldfields' range that has been most severely affected is the northwestern portion of the Santa Rosa Plain. The majority of the known sites severely degraded or extirpated are in the Windsor area (Patterson *et al*. 1994, CH2M Hill 1995). Two of the largest known populations in the county occurred in this area and were considered extirpated by Patterson *et al*. (1994). The extirpations were thought to have resulted from urban and commercial development or agricultural land use changes. For example, one CNDDB occurrence in the area contained 11 colonies in 1984; by 1993, only two were extant (CNDDB 1998). A second occurrence had more than 20 vernal pools in 1985, but by 1994, only one colony of Burke's goldfields was present (CNDDB 1998). This property once contained 50,000 plants, but after repeated disking only about 100 plants remain (Guggolz, pers. comm. 1998). Only a few stable Burke's goldfields sites still exist in the Windsor area, and these are threatened by development (Patterson *et al*. 1994). The City of Windsor has already developed, or designated development, on every Burke's goldfields site within their general planning area (Guggolz pers. comm. 1998).

Since listing in 1991, Burke's goldfields has continued to experience dramatic losses. The USFWS used data from 1994 (Patterson *et al.* 1994) to examine how numbers of Burke's goldfields changed at particular sites between the time of listing and the most recent surveys that had been conducted after listing. A site, as defined by Patterson *et al*. (1994), may be all or part of a CNDDB occurrence. After listing, the number of sites with many individuals decreased, and the number with very few individuals increased. Fifteen of the 28 sites that we have both pre- and post-listing survey data for decreased in size after the species was listed. The percentage of sites with fewer than 10 individuals increased by 30 percent, and the percentage of sites with 10,000 to 100,000 individuals decreased by 7 percent. As of 1994, no sites were recorded with more than 100,000 plants. Data from Patterson *et al*. (1994) also indicate that between the time of listing and 1994, 12 different sites were extirpated or largely destroyed. The data indicate large populations of Burke's goldfields are diminishing and nearly half of the sites may have populations either extirpated or are highly vulnerable to extirpation due to small population numbers (less than 10 individuals) (calculated from Patterson *et al*. 1994; CH2M Hill

1995).

Approximately 15 percent of the acreage of Burke's goldfields sites on the Santa Rosa Plain had some preservation designation as of 1994 (calculated from data in Patterson *et al*. 1994). However, the species has not been observed at the Todd Road Preserve (the largest of the preservation sites), since 1987 (Patterson *et al*. 1994, CH2M Hill 1995). Excluding this site, the preserved acreage of Burke's goldfields sites is only 8 percent of the acreage known in 1994 (calculated from data in Patterson *et al*. 1994). Between 1994 and 1998, one preservation bank with Burke's goldfields had been established and was approved to sell credits for the species; however, only a small portion of the site supported Burke's goldfields.

1998 to present: The 1998 programmatic consultation for the listed plants was designed to allow up to 50 acres (20.23 ha) of low-quality seasonal wetlands to be filled and no more than 30 acres (12.14 ha) could be occupied (or presumed to be occupied) by the listed plant species. Of the 30 acres affected that were occupied or presumed occupied, no more than six acres would be on sites with known records of the listed plants. Affects to no more than six additional acres on sites with known records of listed plants may be authorized under the 1998 Programmatic Consultation at the USFWS's discretion, based upon the USFWS's evaluation of the significance of affects to the first six acres of known listed species habitat and/or upon substantial progress toward a comprehensive conservation program. Since 1998, less than 30 acres of low-quality seasonal wetlands were authorized to be filled under the 1998 Programmatic Consultation. Since 1998, several preservation banks have occurrences of Burke's goldfields, but not all are approved to sell credits for the species.

Burke's goldfields are threatened with habitat loss, fragmentation, and degradation throughout all or part of its range by factors including urbanization, agricultural land use changes, alteration in hydrology, wastewater irrigation, and erosion (CNPS 1977; USFWS 1991; Patterson *et al*. 1994; CH2M Hill 1995; CNDDB 1998). Since the time *L. burkei* was listed in 1991, the species has continued to experience dramatic loss. Patterson *et al*. (1994) evaluated known *L. burkei* sites on the Santa Rosa Plain. Their data indicated that 33 percent of the acreage of known Santa Rosa Plain *L. burkei* sites had been severely degraded or extirpated.

The USFWS used data from Patterson *et al.* (1994) to examine how numbers of *L. burkei* changed at particular sites between the time of listing and the most recent surveys. A site, as defined by Patterson *et al*. (1994), may be all or part of a CNDDB occurrence. After listing, the number of sites with many individuals decreased, and the number with very few individuals increased. Fifteen of the 28 sites for which there is both pre- and post-listing data decreased in size after the species was listed. The percentage of sites with fewer than 10 individuals increased by 30 percent, and the percentage of sites with 10,000 to 100,000 individuals decreased by 7 percent. As of 1994, no sites were recorded with more than 100,000 plants. Data from Patterson *et al*. (1994) also indicate that between the time of listing and 1994, 12 different sites were extirpated or largely destroyed. The data indicate large populations of *L. burkei* are diminishing and nearly half of the sites may have populations either extirpated or are highly vulnerable to extirpation due to small population numbers (less than 10 individuals)

(calculated from Patterson *et al*. 1994; CH2M Hill 1995).

The only known Mendocino County occurrence is presumably extirpated (CH2M Hill 1995). The Manning Flat occurrence, located on private land in Lake County, historically was the largest known occurrence of the species although it has been decreasing in recent years. The site is threatened by extensive gully erosion (CH2M Hill 1995; CNDDB 2008) as well as road improvements and herbicide use (CNDDB 2008). The second Lake County occurrence is on property owned by a winery. Recent reports suggest that some damage to this population has resulted from vineyard operations (Chan pers. comm. 1998). However, in the past the winery owners appeared willing to coordinate with the Service and the U.S. Army Corps of Engineers to avoid and/or minimize further damage to the site (Haley pers. comm. 1998). On the Santa Rosa Plain, many Burke's goldfields locations (entire or portions of entire occurrences) have been destroyed due to urbanization and conversion of land to row crops.

Urban Development and Conversion to Agriculture: The most severely impacted portion of the range of *Lasthenia burkei* has been the northwestern portion of the Santa Rosa Plain. The majority of the known sites severely degraded or extirpated are in the Windsor area (Patterson *et al*.1994, CH2M Hill 1995). Two of the largest known populations in Sonoma County occurred in this area and were considered extirpated by Patterson *et al*. (1994). The extirpations were thought to have resulted from urban and commercial development or agricultural land use changes. For example, one CNDDB occurrence in the area contained 11 colonies in 1984; by 1993, only two were extant (CNDDB 1998). A second occurrence had more than 20 vernal pools in 1985, but by 1994, only one colony of *L. burkei* was present (CNDDB 1998). This property once contained 50,000 plants, but after repeated disking only about 100 plants remain (Guggolz pers. comm. 1998). Only a few stable *L. burkei* sites still exist in the Windsor area, and these are threatened by development (Patterson *et al*. 1994). The City of Windsor has already developed, or designated development, on every *L. burkei* site within their general planning area (B. Guggolz, 1998 pers. comm.). Only a few stable *L. burkei* sites still exist in the Windsor area, and these are threatened by development (Patterson *et al*. 1994). Development in the Windsor area continues to impact the limited amount of remaining *L. burkei* habitat in this area (Chamberlin pers. comm. 2008).

The population of California is expected to increase to 58 million, almost double the 1990 State population, by 2040 (Field *et al*. 1999). Between 1994 and 2005, the Sacramento FWS office engaged in Section 7 consultations for projects with impacts to approximately 20,250 hectares (50,000 acres) of vernal pool habitat, including the loss of 10,125 hectares (25,000 acres) to residential, commercial, and industrial development (USFWS 2005c). The Cities of Santa Rosa, Cotati, and Rohnert Park assisted in the preparation of the *Santa Rosa Plain Conservation Strategy* (2005) and identified the areas expected to be proposed for development by the year 2015. The threat of urban development to these species in the Santa Rosa Plain is expected to continue in the foreseeable future (Conservation Strategy Team 2005).

Alteration of Hydrology: Vernal pool plants are sensitive to changes in the timing and length period of vernal pool inundations (Bauder 2000). Alteration of the hydrological regime as a

result of breaking the clay hard pan (e.g., disking or deep ripping) and draining the pools can change the composition of plant species by invasion of non-native upland species. Conversely, if water from urban or agricultural run-off continues to fill pools during spring and summer months, invasion by plant species adapted to permanent inundation can be expected. Disking appears to be a common activity for fire prevention. Some sites are disked in entirety and others only the perimeter (V. Griego, USFWS, personal observation, 2003 - 2007). Regular disking has resulted in "smearing" (flattening the landscape) and changes in the natural hydrology of the area. Some land owners purposefully changed the hydrology to 'get rid' of the listed plants (Chamberlin pers. comm. 2008b). In addition, the hydrology of the seasonal wetland habitat of these plants in many areas throughout the Santa Rosa Plain has been altered by human activity. This resulted in the loss of hydrologic connectivity to neighboring wetlands, to an extent that conditions may not be suitable for germination and flowering in many years. However, the plants can still persist in the seedbank and have been known to "reappear" once more appropriate hydrologic conditions are reestablished (Rosburg 2001; Kivilaan *et al*. 1981).

Changes to vernal pool habitat associated with residential development include facilitation of the introduction of non-native plants to vernal pool habitats (USFWS 2007). Non-native grasses occur commonly in vernal pool complexes and have become a threat to native vernal pool plants through their capacity to change pool hydrology and competition with native plants. Non-native grasses maintain dominance at pool edges, sequestering light and soil moisture, promoting thatch build-up, and shortening inundations periods. Although the mechanism responsible for the change in inundation is not documented, reduction in inundation period is thought to be due to increased evapo-transpiration at the vernal pools (Marty 2005).

Wastewater Irrigation: Wastewater irrigation is a recently established factor affecting vernal pools on the Santa Rosa Plain. This practice began in the 1970s and has continued which has resulted in changing seasonal wetland plant composition. While the native seasonal wetland species are adapted to a summer-dry Mediterranean climate, summer irrigation results in perennial wetland conditions that are intolerable by native seasonal wetland species (Patterson *et al*. 1994). A 1996 draft Environmental Impact Report (EIR) addressed a proposed long-term wastewater project that would dispose of wastewater from the Laguna Wastewater Treatment Plant by irrigating fields on the Santa Rosa Plain (City of Santa Rosa 1996). The draft EIR stated that wastewater irrigation would avoid impacts to sensitive biological resources. However, in February of 1998, the site supporting many-flowered navarretia had a sign stating wastewater was being used for irrigation on-site (USFWS 2007). Patterson *et al*. (1994) stated that the ongoing need to expand effluent irrigation acreage to keep pace with population growth will continue to jeopardize the existence of oak woodlands and vernal pools on the Santa Rosa Plain unless other, less sensitive lands are found for irrigation or other means of disposal are found. The City of Santa Rosa certified an EIR that evaluated the environmental impacts of additional wastewater storage and irrigation in the Santa Rosa Plain. The City of Santa Rosa is pursuing agreements with other wastewater facilities (Sonoma County Water Agency and Town of Windsor) to share irrigation and storage. The City of Santa Rosa is permitted to apply wastewater biosolids to lands within the Santa Rosa Plains. The California Regional Water Quality Control Board recently issued a renewed permit to Santa Rosa for wastewater

discharges. The permit requires the City of Santa Rosa to study wastewater land application rates to ensure that the City is not over-irrigating. The permit recognized specific pollutants (including toxic pollutants) in the treated wastewater. The permit sets time schedules for these pollutants to be addressed prior to discharge to surface waters. Technically, the California Regional Water Quality Control Board regulations (Water Quality Control Plan for the North Coast Region) prohibit wastewater discharge to surface waters during the summer. The regulations however do not contemplate that wastewater would be used to irrigate vernal pools and other types of seasonal wetlands (USFWS 2007). Unchecked wastewater irrigation may alter the normal hydrology of vernal pools in the Santa Rosa Plain and adversely affect *B. bakeri, L. burkei*, and *L. vinculans*.

Off Highway Vehicles: The use of off highway vehicles continues to degrade some vernal pool habitat in the Santa Rosa Plain. For example, at one location, motocross tracks were created for recreation. A vehicle entered private property, drove through a population of *Blennosperma bakeri*, and became stuck. At another location, someone broke into a locked gate at a California Department of Fish and Game Preserve that provides habitat for these species. It is reasonable to expect activities of this sort to increase as urban development and rural development continue to increase. The level of this threat is likely to be variable and is difficult to predict.

4.3.3 Sonoma Sunshine

Sonoma sunshine was federally listed as endangered on December 2, 1991 (USFWS 1991). No critical habitat has been designated for this species.

Sonoma sunshine is a small annual herb in the aster family. Plants are usually less than 11.8 inches tall with alternate, linear leaves (CNPS 1977; Ordnuff 1993). The stems are hollow and somewhat fleshy, varying from 0.08 to 0.24 inches in diameter. The lower leaves are entire, and the upper leaves have one to three lobes that are 0.4 to 1.2 inches deep (Ordnuff 1993). The yellow disk flowers have white pollen and stigmas, while the sterile ray flowers are yellow or sometimes white, with red stigmas. The lobe pattern of the leaves and the color of ray stigmas separate this species from others in the genus. Although the disk flowers in Sonoma sunshine have pistils, they do not produce achenes. However, each ray flower produces one tapered achenes 0.1 to 0.15 inches long with small rounded or conic protuberances (papillate) and 4 to 6 strongly angled edges (CNPS 1977, Ordnuff 1993). *Blennosperma bakeri* grows in vernal pools and wet grasslands below 100 meters (330 feet) (Hickman 1993). *Blennosperma bakeri* occurs in vernal pools on nearly level to slightly sloping loams, clay loams, and clays. The flowers of *B. bakeri* are self-incompatible, meaning that they can set seed only when fertilized by pollen from a different plant.

Sonoma sunshine grows in vernal pools and wet grasslands below 330 feet (Hickman 1993). In the Sonoma and Cotati valleys, Sonoma sunshine occurs in vernal pools on nearly level to slightly sloping loams, clay loams, and clays (USFWS 1991). The two concentrations of Sonoma sunshine on the Santa Rosa Plain occur on different soil types (Patterson *et al*. 1994). Sonoma sunshine likely grows on Huichica loam north of Highway 12 and on Wright loam and Clear Lake

clay south of Highway 12 (Patterson *et al*. 1994, CNDDB 1998). These soil series are briefly described in the discussion of Burke's goldfields habitat above.

Sonoma sunshine flowers from March to April. According to Thorp (1976) *Andrena blennospermatis* is the primary visitor to Sonoma sunshine and *Andrena layiae* is known to collect pollen from other species of *Blennosperma*. In addition, few generalist insects are associated with species of *Blennosperma* as compared to *Lasthenia* (Thorp 1976). The extent to which pollination of Sonoma sunshine depends on host-specific bees or more generalist pollinators is not currently known. Some generalist insects known to visit the flowers of *Blennosperma* include other bees (Halictidae and Megachilidae), flies (Syrphidae and Bombyliidae), and beetles (Dermestidae, Dasytidae, and Meloidae).

As noted above under Burke's goldfield, seed banks are believed to be of particular importance in annual species subject to uncertain or variable environmental conditions. As with Burke's goldfield, Sonoma sunshine fit these criteria, since they are annual species (Hickman 1993) living in an uncertain vernal pool environment (Holland and Jain 1977). In the absence of data to suggest otherwise, the presence of substantial seed banks for these species is a reasonable assumption.

For nearly 20 years, the only known occurrence (CNDDB occurrence 3) of Sonoma sunshine was the type locality first described in 1946 within the City of Sonoma, Sonoma County, California (Ornduff 1963). In 1963, a second occurrence (occurrence 2) was discovered a few miles south of the first (Ornduff 1963). Both of these first two occurrences were outside of the Santa Rosa Plain but within the Sonoma Valley. The first occurrence within the Santa Rosa Plan was discovered in 1974 (Patterson *et al.* 1994). On the Santa Rosa Plain, the species ranges from near the community of Fulton in the north to Scenic Avenue between the Cities of Santa Rosa and Cotati in the south. Additionally, the species extends or extended from near Glen Ellen to near the junction of State Routes 116 and 121 in the Sonoma Valley.

As with *L. burkei*, the number of historical occurrences (populations and sites in some reports) of Sonoma sunshine has varied depending on author. Waaland and Vilms (1989) reported 30 extant sites with Sonoma sunshine and three extirpated sites. Patterson *et al*. (1994) estimated there were 60 historical populations on separate properties, but that many were hydraulically connected and less than 12 were biologically separate populations. The USFWS (1991) reported Sonoma sunshine from no more than 42 sites, 35 in the Cotati Valley (locally referred to as the Santa Rosa Plain) and 7 in the Sonoma Valley. The CNDDB (2008) lists 26 occurrences of Sonoma sunshine with three known to be extirpated (occurrences 2, 3, and 18) and one listed as possibly extirpated (occurrence 13). However, Ayres and Sloop (*in litt.* 2008) observed at least 35 plants at the Horn Mitigation bank, which may have encompassed part of occurrence 18. According to Sloop (C. Sloop Laguna de Santa Rosa Foundation, personal communication 2008) there are 23 extant Sonoma sunshine sites, although she was only able to sample 10 (Ayres and Sloop *in litt.* 2008). The USFWS is aware of four occurrences not listed in the CNDDB, two of which are in close proximity to existing occurrences 30 and 25 and may not be separate. The other two occurrences are not located near any known record and may

represent previously undocumented occurrences. One is immediately northwest of the City of Windsor (Ayres and Sloop *in litt.* 2008) and the second is in the vicinity of the City of Shiloh. Of the 26 CNDDB occurrences, 22 are presumed to be extant with a majority occurring on the Santa Rosa Plain, one occurring near the City of Glen Ellen (occurrence 5), and two south of the City of Sonoma (occurrence 16 and 22). As of 2008, Sonoma sunshine had been introduced to at least five sites including Alton Lane Mitigation Site, Slippery Rock Conservation Bank, Woodbridge Mitigation Site, Hazel Mitigation Bank, and Carinalli-Todd Mitigation Bank (V Griego pers. comm. 2008).

1991 to 1998: Patterson *et al*. (1994) estimated less than 12 biologically separate populations remain. Of the sites they examined, 17 percent (nearly one-third) had been extirpated, and 17 percent (nearly one-sixth) had not been confirmed recently. An additional 17 percent (one-sixth) were believed to be extant but threatened by development as of 1994 (Patterson *et al*. 1994). A site, as defined by Patterson *et al*. (1994), may be all or part of a CNDDB occurrence. At one CNDDB occurrence, 12 Sonoma sunshine colonies were observed in 1989. By 1993, only six remained (CNDDB 1998). The USFWS is aware of at least five specific Sonoma sunshine sites that have been developed or isolated by surrounding development or vineyards on the Santa Rosa Plain since the time of listing, including the Cobblestone and TMD Brown developments. Other sites have been used as wastewater irrigated pastures, damaged by off road vehicle (ORV) use, heavily grazed, or been subject to land conversion activities (CNDDB 1998, Service files). In addition, Sonoma sunshine is known from at least one of the Burke's goldfield sites mentioned above that were disked without authorization and resulted in enforcement actions being taken by the Corp (USFWS files).

The USFWS used data from 1994 (Patterson *et al.* 1994) to examine how numbers of Sonoma sunshine changed at particular sites between the time of listing and the most recent surveys that had been conducted after listing. After listing, the number of sites with many individuals decreased, and the number with less than 10 individuals increased. The percentage of sites with fewer than 10 individuals increased by 15 percent between the time of listing and 1994.

Approximately 8 percent of the acreage of Sonoma sunshine sites known from the Santa Rosa Plain had some protection as of 1994 (calculated from data in Patterson *et al*. 1994). Of the 120 acres designated as preserve (excludes areas under conservation easement), the amount of habitat containing the species is estimated to be only 2 acres (Guggolz 1995 as cited in CH2M Hill 1995). Between 1994 and 1998, one preservation bank authorized to sell Sonoma sunshine credits had been established, but only 15 individual plants have been observed in recent surveys at the site (Waaland pers. comm. 1998).

1998 to present: The 1998 programmatic consultation was designed to allow up to 50 acres of low-quality seasonal wetlands to be filled and no more than 30 acres could be occupied (or presumed to be occupied) by the listed plant species. Of the 30 affected acres that are occupied or presumed occupied, no more than six acres would be on sites for which there are known records of the listed plants. Affects to no more than six additional acres on sites for which there are known records of listed plants may be authorized under the 1998

Programmatic Consultation at the USFWS's discretion, based upon the USFWS's evaluation of the significance of affects to the first six acres of known listed species habitat and/or upon substantial progress toward a comprehensive conservation program. Between the period of the 1998 Programmatic Consultation and the November 7, 2007 Programmatic Biological Opinion, less than 30 acres of low-quality seasonal wetlands were authorized to be filled under the 1998 programmatic. At this time, it is unknown how many of the 30 acres filled were occupied with one or more of the listed plants. The low-quality seasonal wetlands were to be mitigated for with preservation and creation of listed plant habitat as outlined in the 1998 Programmatic.

Sonoma sunshine is threatened with habitat loss, fragmentation, and degradation throughout all or part of its range by urbanization, waste water irrigation, agricultural land use changes, and alterations in hydrology (Patterson *et al*. 1994; CH2M Hill 1995; CNDDB 2008). These threats are more fully explained above for Burke's goldfields. The type locality (occurrence 3) was extirpated in the 1980s by residential development and conversation of part of the site to vineyards (CNDDB 2008). Occurrence 2, was extirpated in 1986 by activities associated with a vineyard (CNDDB 2008). Occurrence 18, was extirpated as a result of several factors including mowing, disking, alteration in hydrology, and development (CNDDB 2008). A fourth occurrence (13) listed in the CNDDB as possibly extirpated is described as having no remaining suitable habitat as a result of the construction of a residential subdivision (CNDDB 2008) and no individual plants have been observed at this site since 1990. Of the presumed extant Sonoma Valley occurrences (16 and 22) one occurrence was largely destroyed in 1989, but new vernal pools were created and some plants were observed in 1995 (CNDDB 2008). Occurrence 5, in the Sonoma Valley Regional Park, while protected is not managed specifically for conservation (CNDDB 2008); this site had an estimated 25,000 plants in 1991 (CNDDB 2008) and at least 35 plants were present in 2006 (Ayres and Sloop *in litt.* 2008). Occurrences 7 and 8 are both irrigated by waste water (CNDDB 2008) and maybe suffering from invasion by non-native vegetation. A second Sonoma Valley locale is currently used as a pasture. A portion of the occurrence may have been disked, and the landowners of a second portion want to convert the locale to vineyard (Wilcox pers. comm. 1998). The third Sonoma Valley occurrence is in Sonoma Valley Regional Park, which is not managed for conservation (CNDDB 2008). On the Santa Rosa Plain, one locale has probably been extirpated by completion of a subdivision and one locale by major land alterations on the locale (CNDDB 2008). Of the presumed extant locales, some support severely degraded habitat, are threatened by development, or have not supported confirmed populations of Sonoma sunshine in recent years (CH2M Hill 1995; CNDDB 2008).

The USFWS used data from 1994 (Patterson *et al*. 1994) to examine how numbers of *B. bakeri* plants at particular sites changed between the time of listing and the most current surveys that had been performed after listing. After listing, the number of sites with many individuals decreased, and the number with less than 10 individuals increased and the percentage of sites with fewer than 10 individuals increased by 15 percent between the time of listing and 1994.

4.3.4 Sebastopol Meadowfoam

Sebastopol meadowfoam was federally listed as endangered on December 2, 1991 (USFWS 1991). No critical habitat has been designated for this species.

Sebastopol meadowfoam is a small multi-stemmed herb in the false meadowfoam family (*Limnanthaceae*). Plants are usually less than 11.8 inches in height with weak, somewhat fleshy, decumbent stems. Although the first leaves are narrow and undivided, leaves on the mature plant have three to five narrow unlobed leaflets with rounded tips along each side of a long stalk (petiole). The shape of the leaves distinguishes *L. vinculans* from other members of the *Limnanthes* genus. Small, bell or dish-shaped, white flowers appear April through May. The fragrant white flowers are born singly at the end of stems. The seeds of *L. vinculans* germinate after the first significant rains in fall. Repeated drying and filling of pools in the spring favors development of large plants with many branches and long stems. This species grows in Northern Basalt Flow and Northern Hardpan vernal pools (Sawyer and Keeler-Wolf 1995), wet swales and meadows, on the banks of streams, and in artificial habitats such as ditches (Wainwright 1984; CNDDB 2008).

The seeds of Sebastopol meadowfoam germinate after the first significant rains in fall, although late initiation of rains may delay seed germination. Sebastopol meadowfoam plants grow slowly underwater during the winter, and growth rates increase as the pools dry. Repeated drying and filling of pools in the spring favors development of large plants with many branches and long stems. Sebastopol meadowfoam begins flowering as the pools dry, typically in March or April. The largest plants can produce 20 or more flowers. Flowering may continue as late as mid-June, although in most years the plants have set seed and died back by then (Patterson *et al*. 1994). Each plant can produce up to 100 nutlets (a small dry one-seeded fruit) (Patterson *et al*. 1994).

Nutlets of Sebastopol meadowfoam likely remain dormant in the soil, as they do for other species of *Limnanthes* (Patterson *et al*. 1994). One case presents strong circumstantial evidence for persistent, long-lived seed banks in this species. In the late 1980's and early 1990's, a site in Cotati remote from other Sebastopol meadowfoam colonies was surveyed for several years by independent qualified botanists. None of these botanists identified flowering populations of Sebastopol meadowfoam on the project site. Conditions of the pools on the site were highly degraded by wallowing hogs (*Sus scrofa*) and subsequent eutrophication of the pools. Following several years of negative surveys 12 plants of Sebastopol meadowfoam emerged simultaneously in one pool in the first year following removal of hogs. The population expanded rapidly to 60 plants the next year and was larger in subsequent years (USFWS 2007), all limited to one pool. Long-distance dispersal is an improbable explanation for the simultaneous emergence of multiple plants at one location, so seed banks are implicated in this case as well. This example also indicates that lack of Sebastopol meadowfoam during periods of adverse conditions (drought, heavy disturbance, etc.) does not necessarily mean the population is extirpated.

This species grows in Northern Basalt Flow and Northern Hardpan vernal pools (Sawyer and Keeler-Wolf 1995), wet swales and meadows, on the banks of streams, and in artificial habitats such as ditches (Wainwright 1984; CNDDB 2008). The surrounding plant communities range from oak savanna, grassland, and marsh in Sonoma County to riparian woodland in Napa County (CNDDB 2008). Sebastopol meadowfoam grows in both shallow and deep areas but is most frequent in pools 10 to 20 inches (25 to 51 centimeters) deep (Patterson *et al*. 1994). The species is most abundant in the margin habitat at the edge of vernal pools or swales (USFWS 2007). Most confirmed occurrences of Sebastopol meadowfoam on the Santa Rosa Plain grow on Wright loam or Clear Lake clay soils (Patterson *et al*. 1994, CNDDB 2008). A few occurrences are on other soil types, including Pajaro clay loam, Cotati fine sandy loam, Haire clay loam (Patterson *et al*. 1994) and Blucher fine sandy loam (Wainwright 1984).

As with *L. burkei* and *B. bakeri* the number of historical occurrences (populations and sites) of Sebastopol meadowfoam have varied depending on the author. Patterson *et al.* (1994) states that in 1980, populations of *L. vinculans* were known from 17 locations. By 1994, the species was known from 55 individually owned parcels, but the number of individual populations was estimated to be 10 (Patterson *et al.* 1994). According to the CNDDB (2008) there are a total of 39 historical occurrences. In the past, more occurrences were noted in the CNDDB, but many have since been combined into a single occurrence. Occurrence 5 includes 8, 32, and 41, occurrence 1 includes 4, 11, 19, 37, and 44, occurrence 12 includes 13, occurrence 21 includes 45, and occurrence 28 includes part of 18. Thirty-eight occurrences are known from Sonoma County and one occurrence (occurrence 39) in Napa County, at the Napa River Ecological Reserve. In Sonoma County, all but two occurrences were found in the central and southern portions of the Santa Rosa Plain. Occurrence 20 occurred at Atascadero Creek Marsh west of Sebastopol, and occurrence 40 in the vicinity of Knights Valley northeast of Windsor (CNDDB 2008).

The current condition of numerous Sebastopol meadowfoam occurrences is unclear, because many have not been visited in almost a decade. As indicated above, Patterson *et al*. (1994) estimated only 10 hydrologically separate populations of *L. vinculans*. A site, as defined by Patterson *et al*. (1994), may be all or part of a CNDDB occurrence. Of the 55 sites they examined, four sites (7 percent) were considered erroneous, 10 sites (18 percent) were extirpated, 10 sites (18 percent) were extant but threatened by development, and 20 sites (36 percent) were extant but may not have been large enough to qualify as good preserve lands (Patterson *et al*. 1994). Out of the 39 occurrences currently listed in the CNDDB four sites (10 percent) are identified as extirpated and two additional sites (5 percent) listed as possibly extirpated. In 2006, genetic samples were taken from 21 locations with *L. vinculans*, 20 on the Santa Rosa Plain and one (occurrence 39) from Napa County (Ayres and Sloop *in litt.* 2008). Of the 21 sites sampled, 13 correspond to extant CNDDB occurrences. One corresponded to occurrence 12, which was believed to be extirpated (CNDDB 2008) and one site was an entirely new occurrence.

1991 to 1998: Patterson *et al*. (1994) estimated only 10 hydrologically separate populations of Sebastopol meadowfoam exist. Of the sites they examined, nearly 10 percent were considered

erroneous, 18 percent were extirpated, 18 percent were extant but threatened by development, and 36 percent were extant but may not be large enough to qualify as high-quality preserve lands (Patterson *et al*. 1994). A site, as defined by Patterson *et al*. (1994), may be all or part of a CNDDB occurrence. According to USFWS records, significant Sebastopol meadowfoam sites are within southwest Santa Rosa. Other sites have been extensively fragmented by development, leaving parts of larger vernal pool complexes interspersed with homes. Repeated disking and land conversion activities have damaged some sites as well (USFWS files).

Excluding easements, eight Sebastopol meadowfoam sites comprising approximately 170 acres were preserved as of 1994 (Patterson *et al*. 1994). However, only a small portion of this acreage is considered actual Sebastopol meadowfoam habitat (CH2M Hill 1995). These eight sites comprised approximately 11 percent of the acreage of Sebastopol meadowfoam sites known from the Santa Rosa Plain in 1994 (calculated from data in Patterson *et al*. 1994). Between 1994 and 1998, two preservation banks with Sebastopol meadowfoam had been established and were authorized to sell credits for this species.

1998 to present: The 1998 Programmatic Consultation was designed to allow up to 50 acres of low-quality seasonal wetlands to be filled and no more than 30 acres could be occupied (or presumed to be occupied) by the listed plant species. Of the 30 acres affected that were occupied or presumed occupied, no more than six acres would be on sites with known records of the listed plants. Affects to no more than six additional acres on sites with known records of listed plants may be authorized under the 1998 Programmatic Consultation at the USFWS's discretion, based upon the USFWS's evaluation of the significance of affects to the first six acres of known listed species habitat and / or upon substantial progress toward a comprehensive conservation program. Between the period of the 1998 programmatic Consultation and the November 7, 2007 Programmatic Biological Opinion, less than 30 acres of low-quality seasonal wetlands were authorized to be filled under the 1998 programmatic. At this time, it is unknown how many of the 30 acres were occupied with one or more of the listed plants. The low-quality seasonal wetlands were to be mitigated for with preservation and creation of listed plant habitat as outlined in the 1998 Programmatic.

Sebastopol meadowfoam is threatened with habitat loss, fragmentation, and degradation throughout all or part of its range by urbanization, waste water irrigation, agricultural land use changes, small population size, and alterations in hydrology (Patterson *et al*. 1994; CH2M Hill 1995; CNDDB 2008). These threats are more fully explained above for Burke's goldfields. As with Burke's goldfields and Sonoma sunshine, causes of habitat loss include agricultural conversion, urbanization, and road maintenance. Habitat degradation is caused by excessive grazing by livestock, alterations in hydrology, and competition from non-native species (in some cases, exacerbated by removal of grazing), off-highway vehicle use, and dumping (USFWS 1991; Patterson *et al*. 1994; CH2M Hill 1995; CNDDB 2008).

4.4 Environmental Baseline

4.4.1 California Tiger Salamander

HBG has consulted the CDFW California Natural Diversity Data Base (CNDDB) to ascertain the potential for special status animal species occurring within a nine 7.5-minute quadrangle map area. Based on review of the CNDDB, there is the potential for only one special status animal species, California tiger salamander. Although the property is within an urban area, California tiger salamanders have been found in suitable habitats in the project vicinity, and the Santa Rosa Plain Conservation Strategy designates the site as one with a potential for presence of the species. The project site is also within the boundaries of the Santa Rosa Plains Unit of designated critical habitat for the CTS. Further details regarding the potential presence of CTS at the property can be found below.

The CNDDB lists numerous sightings of CTS in close proximity to the site. Nearly all documented occurrences of CTS in the CNDDB in the vicinity of the property are northwest, west, southwest or south of the subject parcels. The nearest record of breeding CTS from the CNDDB is a record of breeding CTS approximately 0.75 miles southeast of the project site at the Horn Mitigation Bank.

Out of the 4.11 acres forming the Project Site, 3.82 acres constitutes habitat suitable to support California tiger salamander. The remaining 0.29 acres of the site is within the paved area that once supported a night club with associated parking areas and access and would not be considered suitable habitat for CTS (see Figure 6). The wetlands at the site do not provide suitable breeding habitat for CTS as the wetlands are too shallow and lacking sufficient food and cover for CTS larvae, and are unlikely to remain inundated long enough to allow CTS metamorphosis.

Although no potential breeding habitats have occurred on the site, the property offers potentially suitable habitat as a movement corridor and or as summer aestivation habitat location within 1.3 miles of a known breeding site for the species, although no individuals have been known to occur within the Action Area. The Santa Rosa Plain Conservation Strategy places the site within more than 2200 feet but within 1.3 miles of an extant or extirpated breeding site. A project developed at this distance from a known breeding site would require a mitigation ratio of 1:1 for site development (1 acre of mitigation would be necessary for every acre of the site disturbed by development).

A final rule regarding designation of critical habitat for the Sonoma County Distinct Population Segment of the CTS in Sonoma County was issued on August 31, 2011 (USFWS 2011). The critical habitat designation included lands that were determined by USFWS to be occupied at the time of listing and contained sufficient physical and biological features to support life history processes essential for the conservation of the Sonoma CTS. A single unit was designated (the Santa Rosa Plains Unit) that contains approximately 47,383 acres, including 745 acre of State lands, 744 acre of city lands, 498 acres of county lands, 9 acres of individually owned tribal trust land, and 45,387 acres of private lands. No Federal lands were included. The

unit is bordered on the west by the Laguna de Santa Rosa floodplain, on the southwest by Hensley Road, on the south by Pepper Road northwest of Petaluma, on the east generally by Petaluma Hill Road and the urban centers of Santa Rosa and Rohnert Park, and on the north by the Town of Windsor. The unit is characterized by vernal pools, seasonal wetlands and associated grassland habitat. The critical habitat unit supports vernal pool complexes and manmade ponds that contain the primary constituent elements essential to conservation of CTS, and is therefore currently known to support breeding Sonoma CTS, upland habitat with underground refugia, and upland dispersal habitat allowing movement between occupied sites.

The project site is located within the designated critical habitat area.

4.4.2 Burke's Goldfields, Sonoma Sunshine and Sebastopol Meadowfoam

The Santa Rosa Plain Conservation Strategy defines areas potentially suitable to support any of the three federally-listed plant species covered by the Conservation Strategy document: Sonoma sunshine, Burke's goldfields, and Sebastopol meadowfoam. The Santa Rosa Plain Conservation Strategy designates the site as one with a potential for presence of any of the three listed species. The mostly non-native vegetation on the property generally does not represent optimal suitable habitat for special status plants. However, to the extent that the Action Area supports vernal pools or seasonal wetlands, the site would support habitat potentially suitable to support any of the three species (Burke's goldfields, Sonoma sunshine or Sebastopol meadowfoam).

No locations for any of the three listed species has been documented for the Action Area within the CNDDB (CDFW 2018). The nearest location for any of the three species reported in the CNDDB is for Sebastopol meadowfoam which occurs at the Horn Mitigation Bank about 0.75 miles southeast of the Action Area.

Ted Winfield conducted special status plant surveys during the spring flowering period of the listed plants in 2013 and 2014. The technical report prepared by Ted Winfield dated June 16, 2014 is included as Attachment 1. No plants of the three listed endangered species were found on the property during any of these surveys. Because several years have passed, an additional survey will be conducted during the spring of 2019.

4.5 Effects of the Proposed Action

4.5.1 California Tiger Salamander

4.5.1.1 California Tiger Salamander- Effects

The applicant proposes to construct an affordable residential apartment development on the property. Out of the 4.11 acres forming the Project Site, 3.82 acres constitutes habitat suitable to support California tiger salamander. The remaining 0.29 acres of the site is within the paved area that once supported a night club with associated parking areas and access and would not be considered suitable habitat for CTS. As there are no aquatic habitats providing suitable CTS

breeding habitat on the site, there would be no impacts to breeding habitat, but construction of the project could result in elimination of upland habitat for the species. HBG estimates that the entire 3.82 total acres of suitable upland habitat for CTS within the designated critical habitat for the species would be impacted by the conversion of the site to the residential use.

If California tiger salamander individuals were present at the time the site is prepared for construction, there is the possibility such individuals could be injured, killed, harmed, or harassed by grading or other equipment. Individuals present could be crushed by use of equipment that could also collapse underground burrows. Individual tiger salamanders disturbed by activities onsite could attempt overland movements in an attempt to find alternative upland habitat. These individuals could be harassed, injured and killed by workers or vehicles during overland movements at the Project Site, and could be subject to increased levels of predation, desiccation or competition for food and shelter. In areas where CTS are present, soil redistribution activities can cause disruption of surface movement, disruption or complete loss of reproduction, harassment from increased human activity, and/or permanent and temporary loss of shelter.

Mitigation of CTS effects will be provided consistent with requirements of the 2007 Programmatic Biological Opinion and the Santa Rosa Plain Conservation Strategy and will be developed as part of a federal Endangered Species Act Section 7 consultation with the USFWS and the process for obtained a CESA Incidental Take Permit (ITP) with the CDFW. Initiation of the Section 7 consultation between the Corps and USFWS will require the preparation of this Biological Assessment pursuant to the requirements of 16 USC § 1536(a)(2) and 50 CFR § 402.12 for the issuance of the § 404 permits. The purpose of this biological assessment is to determine whether any listed species or designated critical habitats are likely to be adversely affected by the action and whether formal consultation is necessary. Under Section 7 of the ESA, consultation by the action agency (the USACE) with the USFWS (or NOAA Fisheries) is required if the proposed action may affect listed species or designated critical habitat.

Construction within 3.82 acres of potenial CTS habitat is not likely to result in the destruction or adverse modification of designated critical habitat for the CTS. This conclusion is based on a comparison of the extent of project effects on potential CTS habitat within the 47,383 acres of designated critical habitat within the Santa Rosa Plain Unit. Alteration of approximately 3.82 acres of potential CTS habitat represents less than 0.001 percent of the critical habitat designated within the Unit. The implementation of the project would not result in a cumulative direct or indirect alteration to or destruction of critical habitat that appreciably diminishes the value of critical habitat for both the survival and recovery of the listed species, and the critical habitat would continue to serve its intended conservation role for CTS.

4.5.1.2 California Tiger Salamander- Proposed Mitigation

Mitigation of CTS effects will be provided consistent with requirements of the 2007 Programmatic Biological Opinion and the *Santa Rosa Plain Conservation Strategy* and are being developed as part of a federal Endangered Species Act Section 7 consultation with the USFWS

and the process for obtaining a CESA Incidental Take Permit (ITP) with the CDFW. Mitigation for approximately 3.82 acres of impacts to potential CTS habitat will be provided consistent with requirements of the Santa Rosa Plain Conservation Strategy and the 2007 Programmatic Biological Opinion. CTS conservation includes mitigation at a 1:1 mitigation ratio as the 3.82 acres of impact would occur within CTS upland habitat that is between 2200 feet and 1.3 miles from extant or extirpated breeding pools. The total CTS mitigation will be 3.82 acres (i.e. 3.82 acres of mitigation at a 1:1 mitigation ratio) and will be provided as discussed below.

CTS populations in the project area will benefit with implementation of the anticipated project mitigation and the conservation into perpetuity of a total of 3.82 acres of potential CTS habitat at a conservation bank or mitigation preserve including a USFWS-approved resources management plan, performance monitoring, maintenance monitoring and compliance reporting, an adaptive management plan, and a funding mechanism to assure long-term management and monitoring. The CTS mitigation described above must be implemented prior to initiation of site preparation for the project.

Biological monitors will be present during initial grading activities associated with the project to remove any CTS encountered from the work area within the project site. Based on CTS relocation guidelines, the most cautious approach to relocating CTS found within the Project site during construction monitoring will be to immediately relocate the CTS to the parcel abutting the southern boundary of the Project site (i.e. placed over the silt fence along the southern boundary). The parcel abutting the project site is ecologically similar to the project site, is undeveloped and supports wetlands and animal burrows, is accessible to adjacent open space, and is the likely natural path of a CTS migrating off the site. This will reduce the direct or indirect injury or mortality if any individual CTS are encountered during construction of the project. Silt fence placed around the perimeter of the development footprint will prevent CTS from entering onto the project work area. A ramp will be constructed along southern boundary and eastern boundary in-line with the silt fence to allow any CTS within the project work area to exit into adjacent habitat but not re-enter. Other protective measures are included in the conservation measures that will reduce adverse effects to CTS and habitat from ground disturbance and increased human activity during construction.

4.5.2 Federally-listed Plant Species

4.5.2.1 Federally-listed Plant Species- Effects

Project construction necessary for implementation of proposed development of the site requires fill in wetlands and waters of the U.S. that will require USACE Clean Water Act authorization under a Nationwide 29 permit. Development of the project proposed by the applicant may permanently impact the entirely of the 0.25 acres of seasonal wetlands that are present on the site.

The 0.25 acres of seasonal wetlands constitutes suitable habitat for the three federally-listed endangered plant species that are known to be extant in the vicinity of the project site (Sonoma sunshine, Burke's goldfields and Sebastopol meadowfoam). The proposed site plan results in fill

(permanent effects) to the 0.25 acres of the seasonal wetlands constituting suitable habitat for listed plants on the property. Protocol surveys conducted at the site during the spring and early summer of 2013 and 2014 failed to locate any individuals of the three listed plant species. Additional plant surveys are scheduled for the spring and summer of 2019.

If any of the plants have occurred in the suitable habitat at the site in the past, the seedbank for these species would continue to be present in the soil. Direct effects to suitable habitat for the three listed plant species resulting from the project would be limited to the 0.25 acres of seasonal wetland that occurs within the 4.11-acre project site. Direct effects resulting from implementation of the applicant's site plan total 0.25 acres of seasonal wetland providing habitat for listed plant species.

4.5.2.1 Federally-listed Plant Species- Proposed Mitigation

Effects on suitable habitat for listed plant species resulting from implementation of the applicant's site plan would consist of 0.25 acres of direct effects. The applicant will compensate for the impacts to suitable habitat for Sonoma sunshine, Burke's goldfields and Sebastopol meadowfoam with conservation of an additional 0.37 acres (0.25 acres of occupied or established habitat and conservation of an additional 0.12 acres of established habitat), pursuant to mitigation ratios of the Conservation Strategy and the Programmatic Consultation. Overall compensation to mitigate for direct effects to suitable habitat for the three federally-listed species resulting from implementation of the applicant's site plan will be accomplished through the purchase of mitigation conservation bank credits or purchase of land and establishment of a preserve with 0.37 acres of habitat for the listed species consistent with the requirements of the 2007 Programmatic Biological Opinion.

4.6 Conservation Measures

The following conservation measures are proposed and will be incorporated into the project description for the Proposed Project. These conservation measures will be USFWS-approved and accomplished prior to groundbreaking for the Project. The mitigation requirements to compensate for project effects to CTS and three federally-listed plant species are summarized in Table 2.

Table 2. Potential Mitigation Requirements for the Proposed Project

Species/Habitat Impacted	Total Suitable Habitat (acs)	Total Permanent Impacts (acs)	Total Temporary Impacts (acs)	Mitigation Ratio Required by Conservation Strategy and Programmatic BO (acs) 1	Total Mitigation Requirement per Conservation Strategy (acs) 2
California Tiger Salamander	3.82	3.82	0	1:1	3.82

Table 2. Potential Mitigation Requirements for the Proposed Project					
Species/Habitat Impacted	Total Suitable Habitat (acs)	Total Permanent Impacts (acs)	Total Temporary Impacts (acs)	Mitigation Ratio Required by Conservation Strategy and Programmatic BO (acs) 1	Total Mitigation Requirement per Conservation Strategy (acs) 2
Sebastopol Meadowfoam	0.25	0.25	0	1:1 Preservation	0.25
				0.5:1 Establishment	0.12
Sonoma Sunshine	0	0	0	1:1 Preservation	0
				0.5:1 Establishment	0
Burke's Goldfields 4	0	0	0	1:1 Preservation	0
				0.5:1 Establishment	0
Wetlands	0.25	0.25	0	1:1 Creation	0.25

1. Mitigation for approximately 3.82 acres of impacts to potential CTS habitat will be provided consistent with requirements of the Santa Rosa Plain Conservation Strategy and the 2007 Programmatic Biological Opinion. All CTS mitigation will be provided at an off-site location and will consist of purchase of CTS credits from an approved mitigation bank consistent with requirements of the 2007 Programmatic Biological Opinion and the Santa Rosa Plain Conservation Strategy. The CTS mitigation described above will be implemented prior to initiation of site preparation for the project.

2. The applicant will implement the following CTS avoidance and minimization measures:

    a) Prior to ground disturbance, silt fence will be installed with the stakes facing inward (e.g. toward the construction site) and the bottom of the silt fence buried approximately 4 inches below ground to exclude CTS from entering the project site. One ramp shall be constructed along and in-line with the silt fence at the approximate center of the southern boundary, and one shall be constructed along the eastern boundary. The ramp shall allow any CTS within the Project Site to exit into adjacent habitat but not re-enter. Silt fence will be inspected by the USFWS-approved biological monitor for the presence of CTS and to insure the integrity of the fence is being maintained. If the silt fence is found to be compromised, then it will be repaired immediately prior to the start of work activities.

    b) A USFWS-approved biological monitor will be on site during initial grading of the project site and provide all construction personnel training on federally and state listed species, their habitat and other species (e.g. migratory birds) that may be

within the project site, and avoidance and minimization measures implemented to protect such species. A list of employees who attend the training will be maintained by the permittee and available to the USFWS and CDFW upon request. s

c) During the initial grading, the biological monitor will check for animals under any equipment such as vehicles and stored pipes and along the silt fence. The biological monitor will check all excavated steep-walled holes or trenches greater than one-foot deep for any CTS.

d) Prior to or during the removal of any structures with a crawl space or water wells the USFWS-approved biologist shall visually survey the crawl space or water well for CTS. If any CTS are discovered, the USFWS-approved biologist will relocate the CTS to a safe location within close proximity to where the CTS was found.

e) Any CTS found within the Project site will be immediately relocated by the USFWS-approved biological monitor to the parcel abutting the southern boundary of the Project Site (i.e. placed over the silt fence along the southern boundary).

f) An erosion and sediment control plan will be implemented to prevent impacts of construction on habitat outside the work areas.

g) Access routes and number and size of staging and work areas will be limited to the minimum necessary to achieve the project goals. Routes and boundaries of the roadwork associated with construction will be clearly marked prior to initiating construction/grading.

h) All foods and food-related trash items will be enclosed in sealed trash containers at the end of each day and removed completely from the site once every three days.

i) No pets will be allowed anywhere on the project site during construction.

j) No more than a maximum speed limit of 15 mph will be permitted.

k) All equipment will be maintained such that there will be no leaks of automotive fluids such as gasoline, oils, or solvents.

l) Hazardous materials such as fuels, oils, solvents, etc., will be stored in sealable containers in a designated location that is at least 200 feet from aquatic habitats. All fueling and maintenance of vehicles will occur at least 200 feet from any aquatic habitat.

m) Grading and clearing will be conducted between April 15 and October 15, of any given year, depending on the level of rainfall and/or site conditions.

3. Effects on suitable habitat for listed plant species resulting from implementation of the applicant's site plan would consist of 0.25 acres of direct effects. The applicant will compensate for the impacts to suitable habitat for Sonoma sunshine, Burke's goldfields and Sebastopol meadowfoam with conservation of an additional 0.37 acres (0.25 acres of occupied or established habitat and conservation of an additional 0.12 acres of established habitat). Overall compensation to mitigate for direct effects to suitable

habitat for the three federally-listed species resulting from implementation of the applicant's site plan will be accomplished through the purchase of mitigation conservation bank credits, consistent with the requirements of the 2007 Programmatic Biological Opinion.

5.0 CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Several projects that will require separate federal action (Section 404 permit from USACE and Section 7 consultation with USFWS) are anticipated in the vicinity of the Project Site. Site specific mitigation impacts to CTS and listed plant species will be identified for each project. In nearby Rohnert Park, the Graton Rancheria Project is currently operational, and a Biological Opinion requiring full mitigation for impacts to CTS and listed plant species was issued as part of the federal action to approve that project.

Cumulative effects to the California tiger salamander include continuing and future conversion of suitable California tiger salamander breeding, foraging, sheltering, and dispersal habitat resulting from urban development as addressed in the *Santa Rosa Plain Conservation Strategy*. Additional urbanization can result in road widening and increased traffic on roads that bisect breeding and upland sites, thereby increasing road-kill while reducing in size and further fragmenting remaining habitats. In addition, California tiger salamanders probably are exposed to a variety of pesticides and other chemicals throughout their range. California tiger salamanders also could die from starvation by the loss of their prey base. Hydrocarbon and other contamination from oil production and road runoff; the application of numerous chemicals for roadside maintenance; urban/suburban landscape maintenance; and rodent and vector control programs may all have negative effects on California tiger salamander populations. In addition, California tiger salamanders may be harmed through collection by local residents.

A common method to control mosquitoes used in Sonoma County (Marin/Sonoma Mosquito and Vector Control District, internet website 2002) is the application of methoprene, which increases the level of juvenile hormone in insect larvae and disrupts the molting process. Lawrenz (1984) found that methoprene (Altosid SR 10) retarded the development of selected crustacea that had the same molting hormones (i.e., juvenile hormone) as insects, and anticipated that the same hormone may control metamorphosis in other arthropods. Because the success of many aquatic vertebrates relies on an abundance of invertebrates in temporary wetlands, any delay in insect growth could reduce the numbers and density of prey available (Lawrenz 1984).

Threats to Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam such as unauthorized fill of wetlands, urbanization, increases in non-native species, and expanded

irrigation of pastures with recycled wastewater discharge, are likely to continue with concomitant adverse effects on these species resulting in additional habitat loss and degradation; increasingly isolated populations (exacerbating the disruption of gene flow patterns); and further reductions in the reproduction, numbers, and distribution of these species which will decrease their ability to respond to stochastic events.

Some activities that do not require a 404 permit could occur that may negatively impact the listed plant species. Such activities include excessive grazing and wastewater irrigation. On-going grazing on the Santa Rosa Plain appears to occur on an infrequent basis such that it may benefit the species by controlling competitive, non-native plant species, but increased grazing nonetheless could cause detrimental effects in the future. The cessation of grazing might also have a negative effect on the species, since non-native competitors have invaded the species' habitat and grazing may currently play an essential role in controlling these competitors.

As described in the Conservation Strategy, urban and rural growth on the Santa Rosa Plain has occurred during the past one hundred years, and for the past twenty years, urban growth has encroached into areas inhabited by the California tiger salamander and the listed plants. The loss of seasonal wetlands caused by development on the Santa Rosa Plain has led to declines in the populations of California tiger salamander and the listed plants. Voters in the cities of Cotati, Rohnert Park, Santa Rosa, and Sebastopol, and the Town of Windsor have established urban growth boundaries for their communities. This is intended to accomplish the goal of city-centered growth, resulting in rural and agricultural land uses being maintained between the urbanized areas. Therefore, it can be reasonably expected that rural land uses will continue into the foreseeable future. While areas of publicly owned property and preserves located in the Santa Rosa Plain will further protect against development in perpetuity, some of the areas within these urban growth boundaries include lands inhabited by California tiger salamanders and the listed plant species. In addition to urban development, agricultural practices have also disturbed seasonal wetlands, California tiger salamanders and listed plant habitat on the Santa Rosa Plain. Nonetheless, some agricultural practices, such as irrigated or grazed pasture, have protected wetlands and potential CTS habitat from intensive development.

The Conservation Strategy took into consideration future cumulative effects from federal and non-federal actions to the California tiger salamander and listed plant habitat within the Santa Rosa Plain. The Conservation Strategy and the interim guidelines are intended to benefit he California tiger salamander and the listed plants by providing a consistent approach for mitigation vital to habitat preservation and the long-term conservation of the species. They are also intended to provide more certainty and efficiency in the project review process. The Conservation Strategy and the interim guidelines provide guidance to focus mitigation efforts on preventing further habitat fragmentation and to establish, to the maximum extent possible, a viable preserve system that will contribute to the long-term conservation and recovery of these listed species. Implementation of the interim mitigation guidelines by the local cities and Sonoma County is expected to reduce potential increases of these cumulative effects.

In terms of cumulative effects on global climate change, the global average temperature has

risen by approximately 0.6 degrees centigrade during the 20th Century (International Panel on Climate Change 2001, 2007; Adger *et al* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (International Panel on Climate Change 2001, 2007; Adger *et al.* 2007), and that it is "very likely" that it is largely due to increasing concentrations of greenhouse gases (carbon dioxide, methane, nitrous oxide, and others) in the global atmosphere from burning fossil fuels and other human activities (Cayan *et al.* 2005, EPA Global Warming webpage http://yosemite. epa.gov; Adger *et al*. 2007). Eleven of the twelve years between 1995 and 2006 rank among the twelve warmest years since global temperatures began in 1850 (Adger *et al*. 2007). The warming trend over the last fifty years is nearly twice that for the last 100 years (Adger *et al*. 2007). Looking forward, under a high emissions scenario, the International Panel on Climate Change estimates that global temperatures will rise another four degrees centigrade by the end of this Century; even under a low emissions growth scenario, the International Panel on Climate Change estimates that the global temperature will go up another 1.8 degrees centigrade (International Panel on Climate Change 2001). The increase in global average temperatures affects certain areas more than others. The western United States, in general, is experiencing more warming than the rest of the Nation, with the 11 western states averaging 1.7 degrees Fahrenheit warmer temperatures than this region's average over the 20th Century (Saunders *et al*. 2008). California, in particular, will suffer significant consequences as a result of global warming (California Climate Action Team 2006). In California, reduced snowpack will cause more winter flooding and summer drought, as well as higher temperatures in lakes and coastal areas. The incidence of wildfires in California will also increase and the amount of increase is highly dependent upon the extent of global warming.

No less certain than the fact of global warming itself is the fact that global warming, unchecked, will harm biodiversity generally and cause the extinction of large numbers of species. If the global mean temperatures exceed a warming of two to three degrees centigrade above pre-industrial levels, twenty to thirty percent of plant and animal species will face an increasingly high risk of extinction (International Panel on Climate Change 2001, 2007). The mechanisms by which global warming may push already imperiled species closer or over the edge of extinction are multiple. Global warming increases the frequency of extreme weather events, such as heat waves, droughts, and storms (International Panel on Climate Change 2001, 2007; California Climate Action Team 2006; Lenihan *et al.* 2003). Extreme events, in turn may cause mass mortality of individuals and significantly contribute to determining which species will remain or occur in natural habitats. As the global climate warms, terrestrial habitats are moving northward and upward, but in the future, range contractions are more likely than simple northward or upslope shifts. Ongoing global climate change (Anonymous 2007; Inkley *et al*. 2004; Adger *et al*. 2007; Kanter 2007) likely imperils the California red-legged frog and the resources necessary for its survival. Since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

6.0 CONCLUSIONS

After reviewing the current status of the California tiger salamander, Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine, the environmental baseline for the action area, the effects of the proposed residential apartment project and cumulative effects, the proposed project may affect but is not likely to adversely affect the California tiger salamander, Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine. The proposed project is not likely to jeopardize the continued existence of the California tiger salamander, Burke's goldfields, Sebastopol meadowfoam and Sonoma sunshine. This determination is based on the fact that the proposed action includes conservation measures to offset the adverse effects of the Project on these species consistent with the conservation measures in the 2007 Programmatic Consultation and *Santa Rosa Plain Conservation Strategy*.

The loss of CTS dispersal habitat and seasonal wetland habitat of endangered plants at the project site resulting from implementation of the applicant's site plan will be minimized by the conservation and management of 3.82 acres of California tiger salamander habitat and 0.37 acres of Sonoma sunshine, Sebastopol meadowfoam and Burke's goldfields habitat at a USFWS-approved conservation bank or other location which would follow the recommendations of the 2007 Programmatic and as described in conservation measures of the proposed action. The project is also not likely to result in the destruction or adverse modification of designated critical habitat for the California tiger salamander. This determination is based on a comparison of the extent of project effects on potentially suitable CTS habitat within the 47,383 acres of designated critical habitat within the Santa Rosa Plain Unit. The eventual alteration of a total of 3.82 acres of potentially suitable CTS habitat (both temporary and permanent impacts) represents less than 0.01 percent of the critical habitat designated within the Unit. The implementation of the project would not result in a direct or indirect alteration to or destruction of critical habitat that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species, and the critical habitat would continue to serve its intended conservation role for CTS.

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Figures

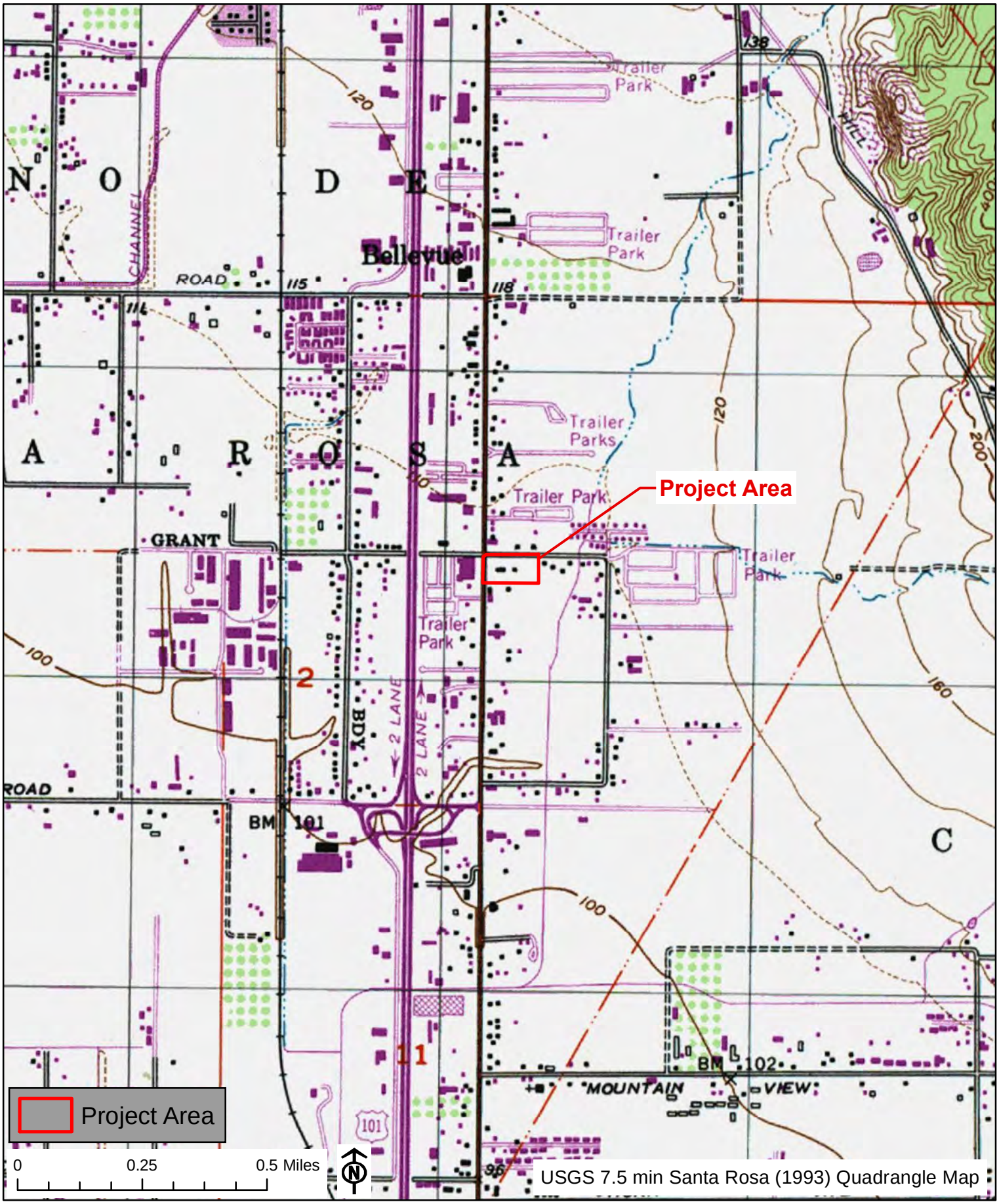


Figure 1. USGS Topographic Map – Location of the Action Area

The Redwood Apartments Project
Sonoma County, California, USACE File# 2003-28294N

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

11-15-2018

Figure 2. Recent Aerial Imagery of the Action Area

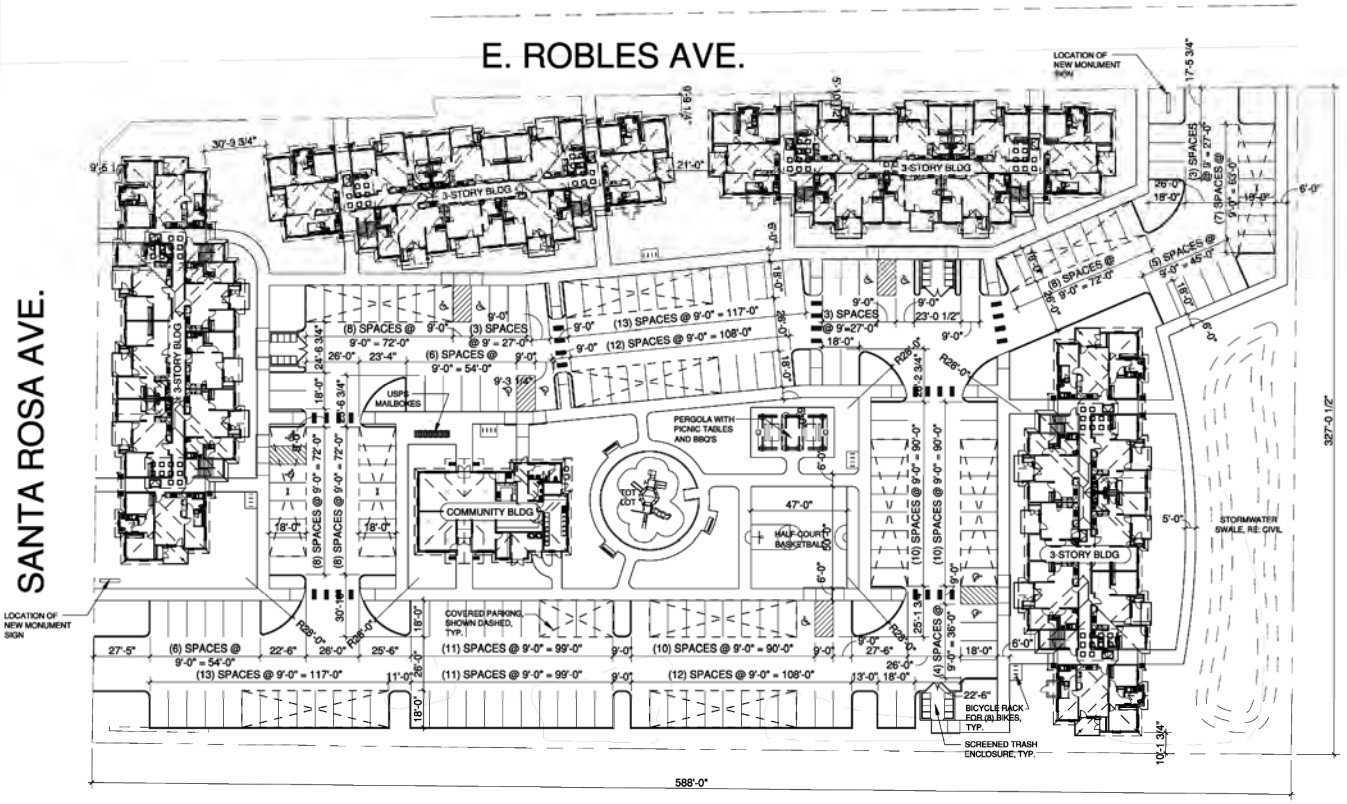
The Redwood Apartments Project

Sonoma County, California, USACE File# 2003-28294N

Huffman-Broadway Group, Inc.

ENVIRONMENTAL REGULATORY CONSULTANTS

11-15-2018



SITE PLAN

APPLICANT
PACIFIC COMPANIES
CALEB ROOPE
430 E. STATE STREET, SUITE 100
EAGLE, IDAHO 83616
(208) 461-0022

ARCHITECT
PACIFIC WEST ARCHITECTURE
DOUGLAS GIBSON, IDAHO ARCHITECT AR-2084
430 E. STATE STREET, SUITE 100
EAGLE, IDAHO 83616
(208) 461-0022 X3021

ACCESSIBILITY

	# OF UNITS	PERCENTAGE
ACCESSIBLE UNITS (10% TOTAL)	10	10.42%
SENSORY IMPAIRED UNITS (4% TOTAL)	4	4.17%
ADAPTABLE (ALL NON-ACCESSIBLE GRND FLR. UNITS REQ.)	22	22.92%

UNIT MIX SUMMARY

		CONDITIONED SQ. FOOTAGES
(12) 1-BEDROOM UNITS	(12) x 566 S.F. =	6,816 S.F.
(36) 2-BEDROOM TYPE A UNITS	(36) x 799 S.F. =	28,764 S.F.
(24) 2-BEDROOM TYPE B UNITS	(24) x 761 S.F. =	18,264 S.F.
(24) 3-BEDROOM UNITS	(24) x 1,077 S.F. =	25,848 S.F.
(96) UNITS TOTAL		79,692 S.F.
COMMUNITY AREA		1,854 S.F.
TOTAL		80,316 S.F.

FIRE SPRINKLER

AUTOMATIC FULLY SPRINKLERED SYSTEM WITH CENTRAL CALL STATION, OFF-SITE MONITORING AND FPC'S AT EXTERIOR ACCESSIBLE FIRE SPRINKLER CLOSETS.

PARKING SUMMARY

REQUIREMENTS PER SONOMA COUNTY 26-86-010

ONE BEDROOM UNIT CALCULATIONS:
SPACES REQUIRED: 12 X 1 = 12 TOTAL SPACES REQUIRED (12 COVERED)

TWO BEDROOM UNIT CALCULATIONS:
RESIDENT SPACES REQUIRED: 60 X 2 = 120 SPACES REQUIRED (60 COVERED)

THREE BEDROOM UNIT CALCULATIONS:
RESIDENT SPACES REQUIRED: 24 X 2 = 48 SPACES REQUIRED (24 COVERED)

TOTAL PARKING SPACES REQUIRED, PER 26-86-010 = 180 TOTAL SPACES W/96 COVERED

TOTAL PROVIDED: 181 STANDARD SPACES W/96 COVERED SPACES (INCLUDING 11 ACCESSIBLE SPACES)

BICYCLE PARKING CALCULATIONS:
180 VEHICLE PARKING SPACES REQ'D/5 = 36 BIKE SPACES REQUIRED

TOTAL PROVIDED: 40 SPACES ON (5) BIKE RACKS

SITE SIZE

186,522 S.F.± (4.28 ACRES* ±)

SITE COVERAGE

	SQ. FT.	PERCENTAGE
BUILDING FOOTPRINTS	39,880 S.F.	21.38%
ON-SITE ASPHALT CONCRETE PAVING	64,039 S.F.	34.33%
SITE AMENITIES (PERGOLA, TOT LOT, BASKETBALL COURT)	4,909 S.F.	2.63%
CONCRETE WALKS & PADS	23,391 S.F.	12.51%
LANDSCAPE, OPEN SPACE	54,363 S.F.	29.15%
TOTAL AREA	186,522 S.F.	100%

NOTE: * ALL NUMBERS PROVIDED ARE **ESTIMATED** FOR SITE COVERAGE AND ARE BASED ON PRELIMINARY BOUNDARY INFORMATION WITHOUT CURRENT TOPOGRAPHIC SURVEY

REVISIONS

11/20/18

BP

PWH18-35

PACIFIC WEST ARCHITECTURE

Pacific West Architecture
430 E. STATE STREET, SUITE 100
EAGLE, IDAHO 83616
(208) 461-0022
fax (208) 461-3267

ALASKA - ARIZONA - CALIFORNIA - COLORADO - HAWAII - IDAHO - LOUISIANA - MONTANA - NEVADA - NEW MEXICO - NORTH DAKOTA - OREGON - SOUTH DAKOTA - U.S.V.I. - UTAH - WASHINGTON - WYOMING

PROJECT
THE REDWOOD APARTMENTS
E. ROBLES AND SANTA ROSA AVE. SONOMA COUNTY, CA

A1.1

SCHEMATIC SET / NOT FOR CONSTRUCTION

Figure 3. Project Site Plan
The Redwood Apartments Project
Sonoma County, California, USACE File# 2003-28294N

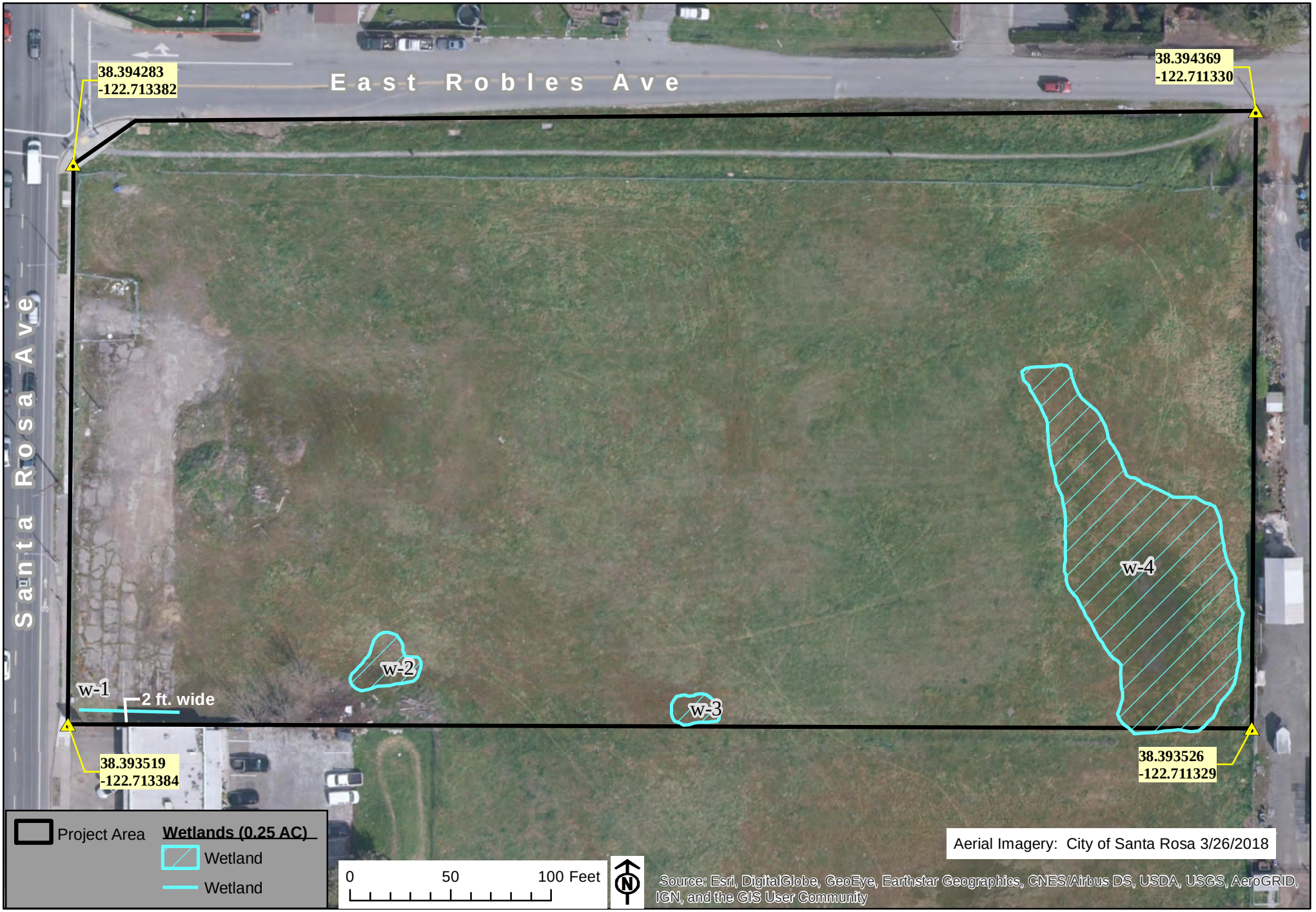


Figure 4. Updated Jurisdictional Delineation Map

The Redwood Apartments Project
Sonoma County, California, USACE File# 2003-28294N

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

11-15-2018

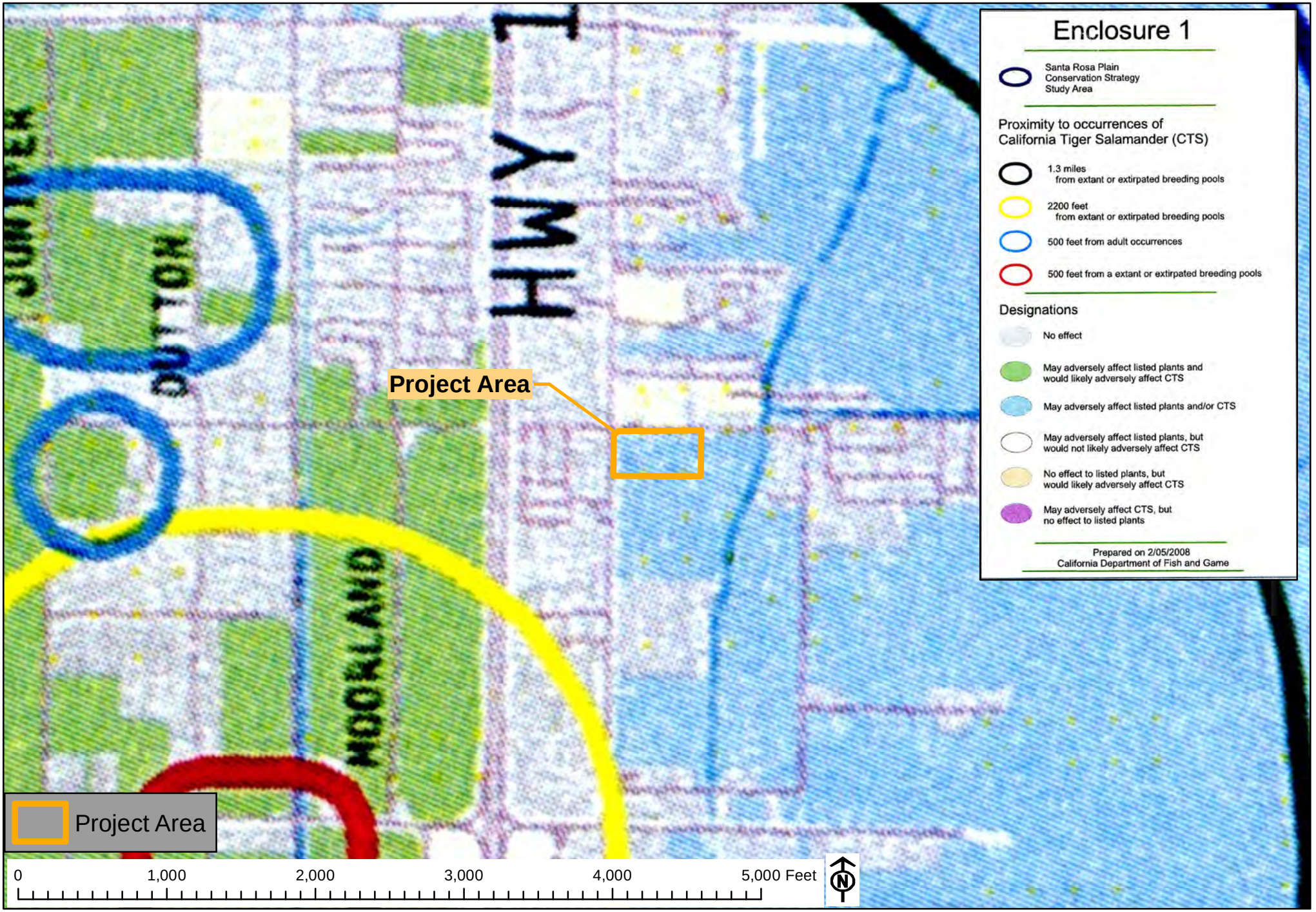


Figure 5. Santa Rosa Plain Conservation Strategy Designations in the Project Area

The Redwood Apartments Project
Sonoma County, California, USACE File# 2003-28294N

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

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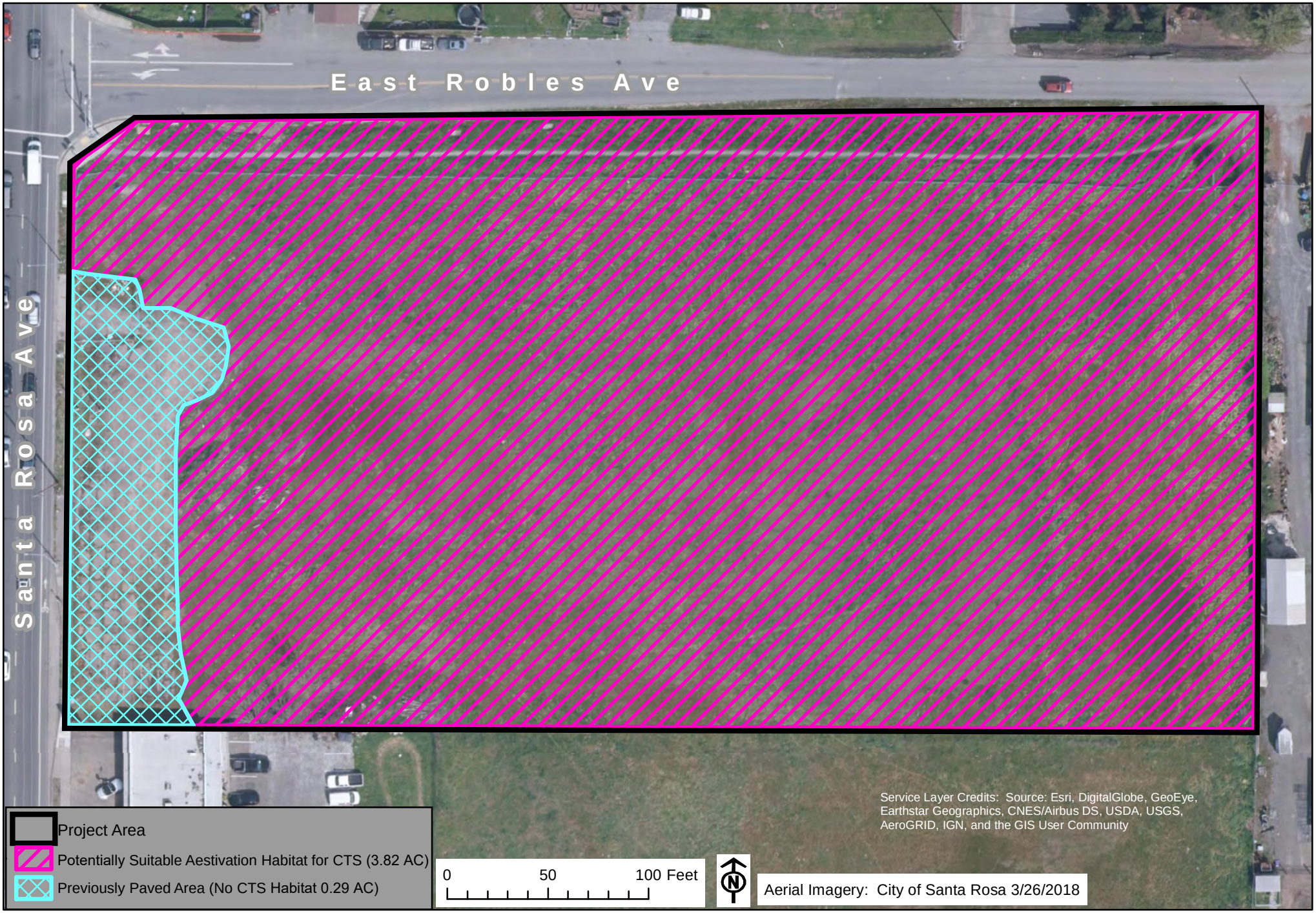

Figure 6. Location of Potentially **Suitable CTS Habitat in the Action Area**

The Redwood Apartments Project
Sonoma County, California, USACE File# 2003-28294N

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

11-15-2018

Attachments

Attachment 1

Winfield, Ted P. 2014. Special Status Plant Survey Report 3422 Santa Rosa Avenue (APN 134-132-070). Prepared for Ken Koss. June 16, 2014.

SPECIAL-STATUS PLANT SURVEY REPORT

3422 SANTA ROSA AVENUE

(APN: 134-132-070)

SANTA ROSA, CA

Prepared for:

Mr. Ken Koss
TK Development, LLC
6420 Via Del Cerrito
Rancho Murieta, CA 95683

Prepared by

Ted P. Winfield, Ph.D.
Ted Winfield & Associates
1455 Wagoner Drive
Livermore, CA 94550

June 16, 2014

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LIST OF TABLES

1.0 INTRODUCTION

The purpose of this report is to provide the result of special-status plant surveys conducted in 2013 and 2014 at an approximately 4.11-acre parcel located at 3422 Santa Rosa Avenue (APN 134-132-070) (Site) in Santa Rosa, CA.

1.1 SITE LOCATION

The Site comprises approximately 4.11 acres at the southeast corner of Santa Rosa Avenue and East Robles Avenue in Santa Rosa, CA (Figure 1). Residential development occurs to the north and east of the Site, and undeveloped fallow land occurs to the south (Figure 2). Retail businesses occur on the west side of Santa Rosa Avenue, across from the Site and a small lot supporting retail businesses occurs adjacent to the southwest corner of the Site (Figure 2).

1.2 RECENT AND CURRENT LAND USE

The land use designation for the Site is Urban Residential. Much of the area surrounding the Site appears to have been in place since at least 1993 based on the earliest aerial photographs from Google Earth.

1.3 PHYSICAL AND HYDROLOGIC CONDITIONS

1.3.1 Topography and Drainage

The property is relatively flat, with less than two feet elevational change across the Site from west to east (less than 1%). No natural drainage features are present several depressional area occur along the eastern and southern side of the Site that pond water for sufficient duration to support wetlands.

1.3.2 Soils

The soils on the site are mapped by the Soil Conservation Service[1] as belonging to the ponded phase of the Wright loam series, 0-2 percent slopes. Generally, Wright loam series consists of somewhat poorly drained and moderately well drained loamy soils with a clay subsoil.

[1] U.S. Department of Agriculture, Natural Resources Conservation Service. Web Soil Survey, accessed June 16, 2014.

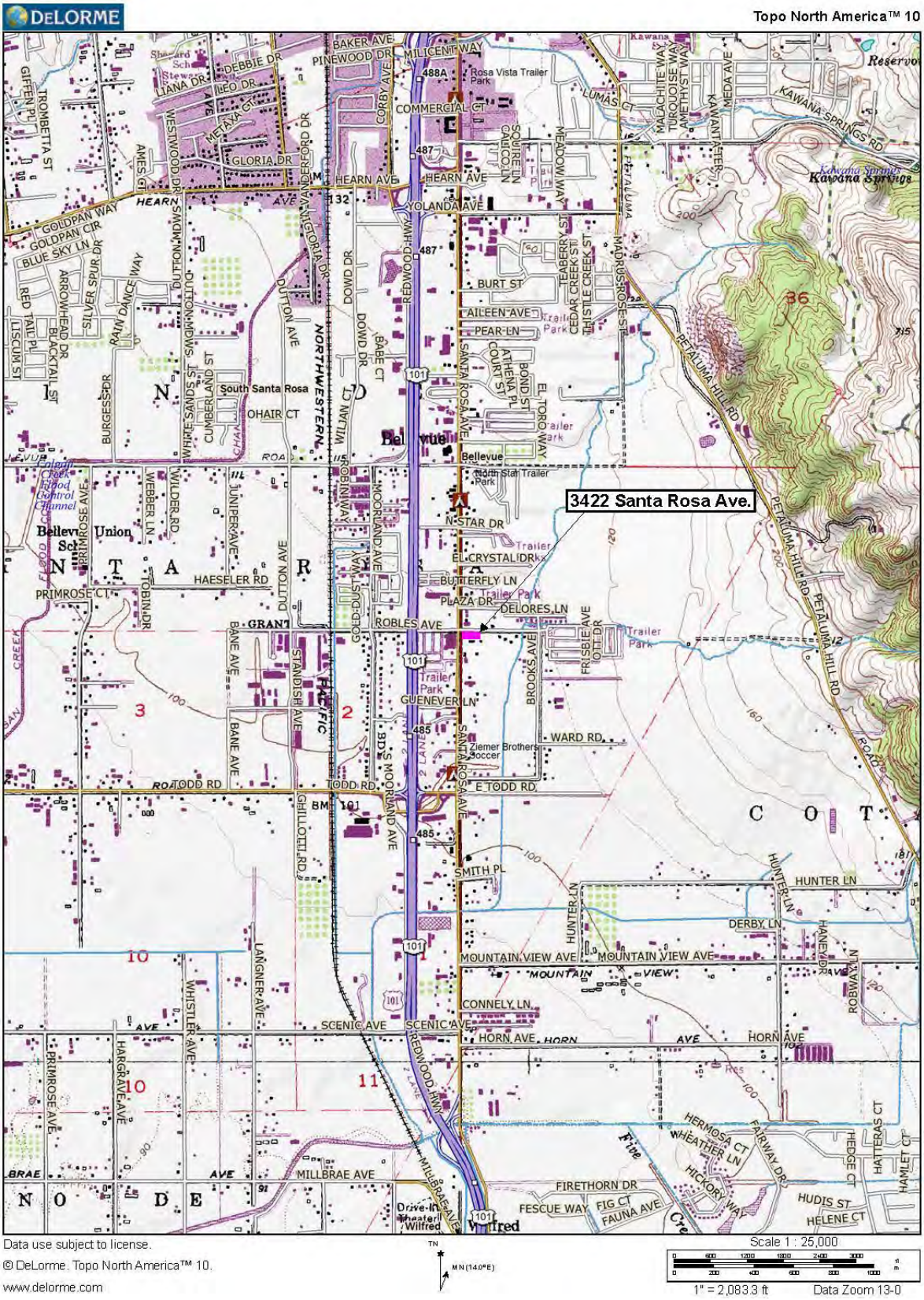

Figure 1. Site location map.

Figure 2. Site vicinity map.

2.0 SURVEY PROTOCOLS

The vegetation at the Site was surveyed on the following dates in 2013 and 2014 by Dr. Ted P. Winfield: April 2, April 12 and May 3, 2013, and April 7, April 16, and May 1, 2014. Table 1 presents the sample dates, the reference sites visited and the species in flower at the reference sites at the time of the visit.

Table 1. Survey dates, reference sites and plants in flower at time of reference site visits.

DATE	REFERENCE SITE	SPECIES
April 2, 2013	Carinalli-Todd Road Mitigation Bank	LIVI, BLBA
April 12, 2013	Carinalli-Todd Road Mitigation Bank Alton North Conservation Bank	LIVI, BLBA BLBA, LABU
May 3, 2013	Alton North Conservation Bank	BLBA, LABU
April 7, 2014	Skate Park-City Site on Piner Avenue Alton North Conservation Bank	BLBA BLBA
April 16, 2014	Swift Conservation Bank Alton North Conservation Bank Skate Park-City Site on Piner Avenue	LIVI BLBA, LABU BLBA
May 1, 2014	Marlow Gobbi Mitigation Site (natural pools) Alton North Conservation Bank	LABU BLBA, LIVI LABU

Species: LIVI – *Limnanthes vinculins* (Sebastopol meadowfoam)
BLBA – *Blennosperma bakeri* (Sonoma sunshine)
LABU – *Lasthenia burkei* (Burke's goldfields)

The surveys were conducted following the U.S. Fish and Wildlife Service protocols[2] and the California Department of Fish and Wildlife protocols[3]. The entire Site was walked and plant species observed and identifiable during each survey noted in a field notebook. The seasonal wetlands were thoroughly searched for possible presence of the Federal- and State-listed endangered Burke's goldfields (*Lasthenia burkei*), Sonoma sunshine (*Blennosperma bakeri*) and Sebastopol meadowfoam (*Limnanthes vinculans*).

Reference sites were visited during same day that the surveys were conducted, as indicated in Table 1. During 2014, other botanists were also consulted about flowering of the endangered plants at other sites to confirm that the target endangered plant species were also flowering at other sites throughout the Santa Rosa Plain.

[2] Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed Plants on the Santa Rosa Plain. Modified from the September 23, 1996 Service Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants.

[3] California Department of Fish and Game (CDFG). Protocols for surveying and evaluating impacts to special status native plant populations and natural communities. November 24, 2009.

3.0 FINDINGS

3.1 INTRODUCTION

The Site consists primarily of upland habitat dominated by non-native annual grasses and forbs. Four small areas of seasonal wetland habitat totaling approximately 0.35 acre occurs around the eastern and southern margins according to the preliminary jurisdictional determination verified by the U.S. Army Corps of Engineers (Figure 3).

A list of species observed at the Site during the special-status plant surveys is presented in Appendix A.

3.1.1 Annual Grasslands

The non-native annual grassland habitat is dominated by non-native annual grass species and forbs. Common non-native grass species include slender oats[4] (*Avena barbata*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), ryegrass (*Festuca perennis*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), foxtail fescue (*Festuca myuros*) and Harding grass (*Phalaris aquatica*). The more common forb species include chicory (*Cichorium intybus*), rough cat's-ear (*Hypochaeris radicata*), prickly lettuce (*Lactuca serriola*), bristly ox-tongue (*Helminthotheca echioides*) purple salsify (*Tragopogon porrifolius*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativa*), filaree (*Erodium botrys, E. cicutarium*), vetch (*Vicia sativa*), bur clover (*Medicago polymorpha*), and Himalayan blackberry (*Rubus armeniacus*).

3.1.2. Seasonal Wetlands

Approximately 0.35 acre of seasonal wetland habitat is present at the Site (Figure 3). Common wetland species present in these wetlands include Mediterranean barley, California semaphore grass (*Pleuropogon californicus*), meadow barley (*Hordeum brachyantherum*), rabbit's-foot grass (*Polypogon monspeliensis*), dense sedge (*Carex densa*), spike rush (*Eleochris macrostachya*), brown-headed rush (*Juncus phaeocephalus*), and curly dock (*Rumex crispus*). Other plants present in the wetlands included the invasive pennyroyal (*Mentha pulegium*), prickle-seeded buttercup (*Ranunculus muricatus*), and hyssop loosestrife (*Lythrum hyssopifolium*).

[4] Plant nomenclature follows The Jepson Manual (2012). Vascular Plants of California. Second Edition. University of California Press, Berkeley, CA.

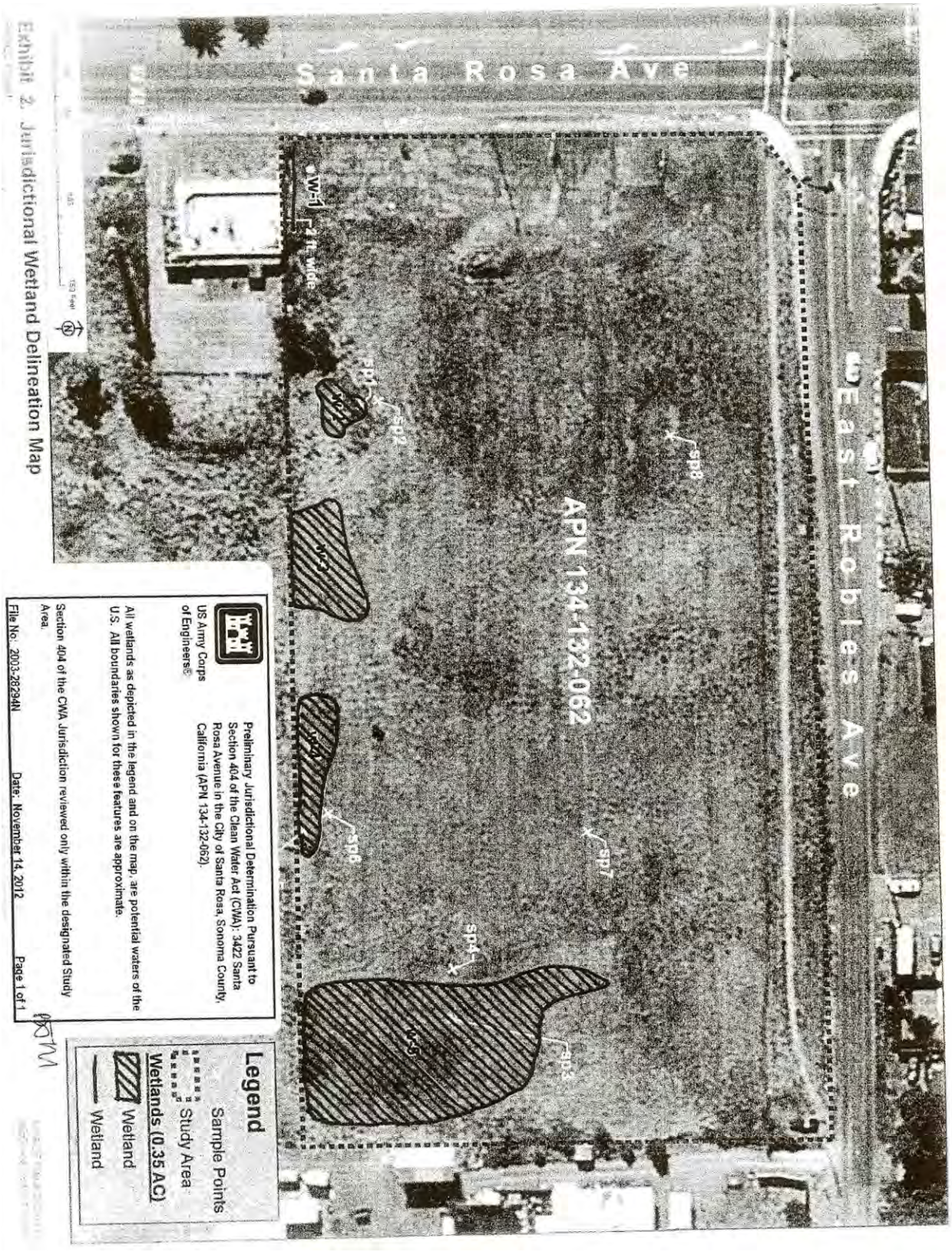

Figure 3. Verified preliminary wetland jurisdictional map verified by the U.S. Army Corps of Engineers November 14, 2012. The correct APN is 134-132-070.

3.2 SPECIAL-STATUS PLANTS

The California Natural Diversity Database (CNDDB), and California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants were searched for information on special-status plants for Santa Rosa, Sebastopol, Healdsburg, Two Rocks, and Cotati USGS Quadrangle maps, which defines the low land areas in the region. Special-status plant species are defined in *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*[5] to include all plant species that meet one or more of the following criteria:

- Listed or proposed for listing as threatened or endangered under FESA or candidates for possible future listing as threatened or endangered under FESA (50 CFR §17.12).
- Listed or candidates for listing by the State of California as threatened or endangered under CESA (Fish and Game Code §2050 *et seq.*).
- Listed as rare under the California Native Plant Protection Act (Fish and Game Code §1900 *et seq*.). A plant is **rare** when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens (Fish and Game Code §1901).
- Meet the definition of rare or endangered under CEQA §15380(b) and (d). Species that may meet the definition of rare or endangered include the following:
    - Species considered by the California Native Plant Society (CNPS) to be "rare, threatened or endangered in California" (Lists 1A, 1B and 2);
    - Species that may warrant consideration on the basis of local significance or recent biological information;
    - Some species included on the California Natural Diversity Database's (CNDDB) *Special Plants, Bryophytes, and Lichens List* (California Department of Fish and Game 2008).
- Considered a **locally significant species,** that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G). Examples include a species at the outer limits of its known range or a species occurring on an uncommon soil type.

A total of fifty-two special-status plants were identified as occurring in the region (Table 2). The list of these special-status plant species, their flowering period, habitat preference, and potential to occur at the Site is presented in Table 3.

[5] California Department of Fish and Game (CDFG). Protocols for surveying and evaluating impacts to special status native plant populations and natural communities. November 24, 2009.

Table 2. List of special-status plant species reported to occur in the region and their regulatory status.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS*	STATE STATUS*	CNPS LIST
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	E		1B.1
Amorpha californica var. napensis	Napa false indigo			1B.2
Amsinckia lunaris	bent-flowered fiddleneck			1B.2
Arctostaphylos canescens ssp. sonomensis	Sonoma canescent manzanita			1B.2
Arctostaphylos densiflora	Vine Hill manzanita		E	1B.1
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita			1B.1
Astragalus claranus	Clara Hunt's milk-vetch	E	T	1B.1
Balsamorhiza macrolepis var. macrolepis	big-scale balsamroot			1B.2
Blennosperma bakeri	Sonoma sunshine	E	E	1B.1
Brodiaea californica var. leptandra	narrow-anthered California brodiaea			1B.2
Calamagrostis crassiglumis	Thurber's reed grass			2.1
Campanula californica	swamp harebell			1B.2
Carex albida	white sedge	E	E	1B.1
Castilleja uliginosa	Pitkin Marsh paintbrush		E	1A
Ceanothus confusus	Rincon Ridge ceanothus			1B.1
Ceanothus divergens	Calistoga ceanothus			1B.2
Ceanothus foliosus var. vineatus	Vine Hill ceanothus			1B.1
Ceanothus sonomensis	Sonoma ceanothus			1B.2
Centromadia parryi ssp. parryi	pappose tarplant			1B.2
Chorizanthe valida	Sonoma spineflower	E	E	1B.1
Clarkia imbricata	Vine Hill clarkia	E	E	1B.1
Cordylanthus tenuis ssp. capillaris	Pennell's bird's-beak	E	R	1B.2
Cuscuta obtusiflora var. glandulosa	Peruvian dodder			2.2
Delphinium luteum	golden larkspur	E	R	1B.1
Downingia pusilla	dwarf downingia			2.2
Erigeron serpentinus	serpentine daisy			1B.3
Fritillaria liliacea	fragrant fritillary			1B.2
Gilia capitata ssp. tomentosa	wooly-headed gilia			1B.1
Hemizonia congesta ssp. congesta	seaside tarplant			1B.2
Horkelia tenuiloba	thin-lobed horkelia			1B.2
Lasthenia burkei	Burke's goldfields	E	E	1B.1
Lasthenia californica ssp. bakeri	Baker's goldfields			1B.2
Legenere limosa	legenere			1B.1
Leptosiphon jepsonii	Jepson's leptosiphon			1B.2
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	E	E	1B.1
Limnanthes vinculans	Sebastopol meadowfoam	E	E	1B.1

Mertensia bella	Oregon lungwort			2.2
Microseris paludosa	marsh microseris			1B.2
Monardella villosa ssp. globosa	robust monardella			1B.2
Navarretia leucocephala ssp. bakeri	Baker's navarretia			1B.1
Navarretia leucocephala ssp. plieantha	many-flowered navarretia	E	E	1B.2
Pleuropogon hooverianus	North Coast semaphore grass		T	1B.1
Potentilla uliginosa	Cunningham Marsh cinquefoil			1A
Rhynchospora alba	white beaked-rush			1B.1
Rhynchospora californica	California beaked-rush			2.2
Rhynchospora capitellata	brownish beaked-rush			2.1
Rhynchospora globularis	round-headed beaked-rush			1B.1
Trifolium amoenum	showy rancheria clover	E		1B.1
Trifolium buckwestiorum	Santa Cruz clover			1B.2
Trifolium hydrophilum	saline clover			1B.2
Triquetrella californica	coastal triquetrella			2.3
Viburnum ellipticum	oval-leaved viburnum			2.3

* Federal Status: E = Endangered; State Status: E = Endangered, R = Rare, T = Threatened
CNPS Designations: List 1A = Species presumed extinct in California. List 1B = Species rare and endangered in California and elsewhere. List 2 = Species rare and endangered in California but more common elsewhere. List 3 = Species for which additional data are needed.

Table 3. Special-status plant species reported to occur in the region, their flowering period, habitat preference and likelihood of occurring at the Site.

Scientific Name	Common Name	Flowering Period	Habitat	Potential Occurrence at Site
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	May-July	Marshes and swamps (freshwater); riparian scrub	**Unlikely.** Habitats for species not present at site
Amorpha californica var. napensis	Napa false indigo	Apr-July	Broadleafed upland forest (openings); chaparral; cismontane woodland	**Unlikely.** Habitats for species not present at site
Amsinckia lunaris	bent-flowered fiddleneck	Mar-June	Coastal bluff scrub; cismontane woodland; valley and foothill grassland	**Low.** Marginally suitable grassland habitat present, but not observed during surveys
Arctostaphylos canescens ssp. sonomensis	Sonoma canescent manzanita	Jan-June	Chaparral; cismontane woodland; lower montane coniferous forest/ sometimes serpentinite	**Unlikely.** Habitats for species not present at site
Arctostaphylos densiflora	Vine Hill manzanita	Feb-April	Chaparral	**Unlikely.** Habitats for species not present at site
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	Feb-Apr (May)	Chaparral; cismontane woodland	**Unlikely.** Habitats for species not present at site
Astragalus claranus	Clara Hunt's milk-vetch	Mar-May	Chaparral (openings); cismontane woodland; valley and foothill grassland/serpentinite or volcanic, rocky, clay	**Unlikely.** Habitats for species not present at site
Balsamorhiza macrolepis var. macrolepis	big-scale balsamroot	Mar-June	Chaparral; cismontane woodland; valley and foothill grassland/ sometimes serpentinite	**Unlikely.** Habitats for species not present at site
Blennosperma bakeri	Sonoma sunshine	Mar-May	Valley and foothill grasslands (mesic); vernal pools	**Low.** Marginally suitable grassland habitat present, but not observed during surveys
Brodiaea californica var. leptandra	narrow-anthered California brodiaes	May-July	Broadleafed upland forest; chaparral; cismontane woodland; lower montane coniferous forest; valley and foothill grassland (volcanic)	**Unlikely.** Habitats for species not present at site

Calamagrostis crassiglumis	Thurber's reed grass	May-July	Coastal scrub (mesic); marshes and swamps (freshwater)	**Unlikely.** Habitats for species not present at site
Campanula californica	swamp harebell	Jun-Oct	Bogs and fens; closed-cone coniferous forest; coastal prairie; meadows and seeps; marxhes and swamps (freshwater); north coast coniferous forest	**Unlikely.** Habitats for species not present at site
Carex albida	white sedge	May-July	Bogs and fens; marshes and swamps (freshwater)	**Unlikely.** Habitats for species not present at site
Castilleja uliginosa	Pitkin Marsh paintbrush	Jun-July	Marshes and swamps (freshwater)	**Unlikely.** Habitats for species not present at site
Ceanothus confusus	Rincon Ridge ceanothus	Feb-June	Closed-cone coniferous forest; chaparral; cistonatne woodland/ volcanic or serpentinite	**Unlikely.** Habitats for species not present at site
Ceanothus divergens	Calistoga ceanothus	Feb-May	Chaparral (serpentinite or volcanic, rocky)	**Unlikely.** Habitats for species not present at site
Ceanothus foliosus var. vineatus	Vine Hill ceanothus	Mar-May	Chaparral	**Unlikely.** Habitats for species not present at site
Ceanothus sonomensis	Sonoma ceanothus	Feb-April	Chaparral (sandy, serpentinite or volcanic)	**Unlikely.** Habitats for species not present at site
Centromadia parryi ssp. parryi	pappose tarplant	May-Nov	Chaparral; coastal prairie; meadows and seeps; marshes and swamps (coastal salt marshes); valley and foothill grassland (vernally mesic/often alkaline)	**Unlikely.** Habitats for species not present at site
Chorizanthe valida	Sonoma spineflower	Jun-Aug	Coastal prairie (sandy)	**Unlikely.** Habitats for species not present at site
Clarkia imbricata	Vine Hill clarkia	Jun-Aug	Chaparral; valley and foothill grassland/acidic sandy loam)	**Unlikely.** Habitats for species not present at site
Cordylanthus tenuis ssp. capillaris	Pennell's birds-beak	Jun-Sept	Closed-cone coniferous forest; chaparral	**Unlikely.** Habitats for species not present at site
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	Jul-Oct	Marshes and swamps (freshwater)	**Unlikely.** Habitats for species not present at site
Delphinium luteum	golden larkspur	Mar-May	Chaparral; coastal prairie; coastal scrub/rocky	**Unlikely.** Habitats for species not present at site

Downingia pusilla	dwarf downingia	Mar-May	Valley and foothill grasslands (mesic); vernal pools	**Unlikely.** Habitats for species not present at site
Erigeron serpentinus	serpentine daisy	May-Aug	Chaparral (serpentinite, seeps)	**Unlikely.** Habitats for species not present at site
Fritillaria liliacea	fragrant fritillary	Feb-Apr	Cismontane woodland; coastal prairie; coastal scrub; valley and foothill grassland/often serpentinite	**Unlikely.** Habitats for species not present at site
Gilia capitata ssp. tomentosa	wooly-headed gilia	May-Jul	Coastal bluff scrub, valley and foothill grasslands/serpentinite; rocky outcrops	**Unlikely.** Habitats for species not present at site
Hemizonia congesta ssp. congesta	seaside tarplant	Apr-Nov	Valley and foothill grassland/ sometimes roadsides	**Low.** Marginally suitable grassland habitat present, but not observed during surveys
Horkelia tenuiloba	thin-lobed horkelia	May-July	Broadleafed upland forest; chaparral; valley and foothill grassland/mesic openings, sandy	**Unlikely.** Habitats for species not present at site
Lasthenia burkei	Burke's goldfields	Apr-June	meadows and seeps; vernal pools	**Low.** Marginally suitable grassland habitat present, but not observed during surveys
Lasthenia californica ssp. bakeri	Baker's goldfields	Apr-Oct	Closed-cone coniferous forest (openings); coastal scrub; meadows and seeps; marshes and swamps	**Unlikely.** Habitats for species not present at site
Legenere limosa	legenere	Apr-June	Vernal pools	**Low.** Marginally suitable grassland habitat present, but not observed during surveys
Leptosiphon jepsonii	Jepson's leptosiphon	Mar-May	Chaparral; cismontane woodland	**Unlikely.** Habitats for species not present at site
Lilium pardalinum ssp. pitkinense	Pitkin Marsh lily	Jun-July	Cismontane woodland; meadows and seeps, marshes and swamps (freshwater)/mesic, sandy	**Unlikely.** Habitats for species not present at site
Limnanthes vinculans	Sebastopol meadowfoam	Apr-May	Meadows and seeps, valley and foothill grassland; vernal pools/vernally mesic	**Low.** Marginally suitable grassland habitat present, but not observed during surveys

Mertensia bella	Oregon lungwort	May-July	Meadows and seeps; upper montane coniferous forest/mesic	**Unlikely.** Habitats for species not present at site
Microseris paludosa	marsh microseris	Jun-July (Aug)	Closed-cone coniferous forest; cismontane woodland; coastal scrub; valley and foothill grassland	**Unlikely.** Habitats for species not present at site
Monardella villosa ssp. globosa	robust monardella	Jun-July (Aug)	Broadleafed upland forest (openings); chaparral (openings); cismontane woodland; coastal scrub; valley and foothill grassland	**Low.** Marginally suitable habitat present in seasonal wetlands but not observed during present or previous surveys.
Navarretia leucocephala ssp. bakeri	Baker's navarretia	April-July	Cismontane woodland; lower montane coniferous forest; meadows and seeps; valley and foothill grassland; vernal pools/mesic	**Unlikely.** Habitats for species not present at site
Navarretia leucocephala ssp. plieantha	many-flowered navarretia	May-June	Vernal pools (volcanic ash flow)	**Low.** Marginally suitable grassland habitat present, but not observed during surveys
Pleuropogon hooverianus	North Coast semaphore grass	Apr-June	Broadleafed upland forest; meadows and seeps; north coastal coniferous forest/open areas, mesic	**Unlikely.** Habitats for species not present at site
Potentilla uliginosa	Cunningham Marsh cinquefoil	May-Aug	Marshes and swamps/freshwater, permanent oligotrophic wetlands	**Unlikely.** Habitats for species not present at site
Rhynchospora alba	white beaked-rush	Jul-Aut	Bogs and fens; meadows and seeps; marshes and swamps (freshwater)	**Unlikely.** Habitats for species not present at site
Rhynchospora californica	California beaked-rush	May-July	Bogs and fens; lower montain coniferous forest; meadows and seeps; marshes and swanps	**Unlikely.** Habitats for species not present at site
Rhynchospora capitellata	brownish beaked-rush	Jul-Aug	Lower montane coniferous forest; meadows and seeps; marshes and swamps; upper montane coniferous forest/mesic	**Unlikely.** Habitats for species not present at site
Rhynchospora globularis	round-headed beaked-rush	Jul-Aug	Marshes and swamps (freshwater)	**Unlikely.** Habitats for species not present at site

Trifolium amoenum	showy rancheria clover	Apr-June	Coastal bluff scrub; valley and foothill grassland (sometimes serpentinite)	**Low.** Marginally suitable grassland habitat present, but not observed during surveys
Trifolium buckwestiorum	Santa Cruz clover	Apr-Oct	broadleafed upland forest, cismontane woodland, coastal prairie/gravely margins	**Unlikely.** Habitats for species not present at site
Trifolium hydrophilum	saline clover	Apr-June	Marshes and swamps; valley and foothill grasslands (mesic, alkaline)	**Unlikely.** Habitats for species not present at site
Triquetrella californica	coastal triquetrella	N/A	Coastal bluff scrub; coastal scrub/soil	**Unlikely.** Habitats for species not present at site
Viburnum ellipticum	oval-leaved viburnum	May-June	Chaparral; cismontaine woodland; lower montane coniferous forest	**Unlikely.** Habitats for species not present at site

Marginally suitable habitat was present at the Site for several of the species that occur in grassland habitat and seasonal wetland/vernal pool habitat, including Burke's goldfields, Sonoma sunshine and Sebastopol meadowfoam. All three of the endangered wetland species were observed to be flowering at reference sited during each of the survey days in 2013 and 2014 but none of these species were observed at the Site during the special-status plant surveys conducted in 2013 and 2014.

None of the other special-status species reported to occur in upland grassland habitat or in marshes, swamps or other wetland habitat were observed during the special-status plant surveys.

APPENDIX A. LIST OF SPECIES OBSERVED DURING 2013-2014 SPECIAL-STATUS PLANT SURVEYS.

FAMILY	*SCIENTIFIC NAME*[6]	COMMON NAME
	DICOTYLEDONS	
APIACEAE - Carrot Family		
	Foeniculum vulgare *	fennel
ASTERACEAE - Sunflower Family		
	Chamomilla suaveolens *	pineapple weed
	Cichorium intybus *	chicory
	Helminthotheca echioides *	bristly ox-tongue
	Hypochaeris radicata *	hairy cat's-ear
	Lactuca serriola *	prickly lettuce
	Senecio vulgaris *	common groundsel
	*Tragopogon porrifolius**	purple salsify
	Xanthium strumarium	cocklebur
BRASSICACEAE - Mustard Family		
	*Brassica nigra**	black mustard
	*Brassica rapa**	field mustard
	*Raphanus sativus**	wild radish
	Rorippa curvisiliqua	Western yellowcress
CONVOLVULACEAE - Morning Glory Family		
	*Convolvulus arvensis**	bindweed
FABACEAE - Legume Family		
	Lupinus bicolor	miniature lupine
	Medicago polymorpha *	common burclover
	Vicia sativa *	spring vetch
GERANIACEAE - Geranium Family		
	*Erodium botrys**	broad leaf filaree
	*Erodium cicutarium**	redstem filaree
	Geranium dissectum *	cut-leaved geranium
LAMIACEAE - Mint Family		
	Mentha pulegium *	pennyroyal
LYTHRACEAE - Loosestrife Family		
	Lythrum hyssopifolium *	hyssop loosestrife
PAPAVERACEAE - Poppy Family		
	Eschscholzia californica	California poppy
PLANTAGINACEAE - Plantain Family		
	Plantago lanceolata *	English plantain
POLYGONACEAE - Buckwheat Family		
	*Polygonum aviculare**	prostrate knotweed
	*Rumex acetosella**	sheep sorrel
	Rumex crispus *	curly dock
	*Rumex pulcher**	fiddle dock
PRIMULACEAE - Primrose Family		
	*Anagallis arvensis**	scarlet pimpernel

[6] Plant nomenclature follows The Jepson Manual: Higher Plants of California. Second Edition. B.G. Baldwin (convening editor). University of California Press, Berkeley, CA.

FAMILY	*SCIENTIFIC NAME*[6]	COMMON NAME
RANUNCULACEAE - Buttercup Family		
	*Ranunculus muricatus**	prickle-seeded buttercup
ROSACEAE - Rose Family		
	*Rubus armeniacus**	Himalayan blackberry
	MONOCOTYLEDONS	
CYPERACEAE – Sedge Family		
	Carex densa	dense sedge
	Eleocharis macrostachya	spike rush
JUNCACEAE – Rush Family		
	Juncus phaeochephalus	brown headed rush
POACEAE - Grass Family		
	*Avena barbata**	slender wild oat
	*Avena fatua**	wild oat
	*Briza minor**	little quaking grass
	Bromus carinatus	California brome
	*Bromus diandrus**	ripgut brome
	*Bromus hordeaceus**	soft chess
	*Cynodon dactylon**	Bermuda grass
	*Crypsis schoenoides**	swamp grass
	*Festuca bromoides**	six-weeks fescue
	*Festuca myuros**	foxtail fescue
	*Festuca perennis**	perennial ryegrass
	Hordeum branchyantherum	meadow barley
	Hordeum marinum ssp. *gussoneanum**	Mediterranean barley
	Hordeum murinum ssp. *leporinum**	hare barley, foxtail
	*Phalaris aquatica**	Harding grass
	Pleuopogon californicus	semaphore grass
	*Polypogon monspeliensis**	rabbit's-foot grass

Note: * indicates non-native species

Reference Sites and Observation Dates

DATE	REFERENCE SITE	SPECIES
April 2, 2013	Carinalli-Todd Road Mitigation Bank	LIVI, BLBA
April 12, 2013	Carinalli-Todd Road Mitigation Bank Alton North Conservation Bank	LIVI, BLBA BLBA, LABU
May 3, 2013	Alton North Conservation Bank	BLBA, LABU
April 7, 2014	Skate Park-City Site on Piner Avenue Alton North Conservation Bank	BLBA BLBA
April 16, 2014	Swift Conservation Bank Alton North Conservation Bank Skate Park-City Site on Piner Avenue	LIVI BLBA, LABU BLBA
May 1, 2014	Marlow Gobbi Mitigation Site (natural pools) Alton North Conservation Bank	LABU BLBA, LIVI LABU

Species: LIVI – *Limnanthes vinculins* (Sebastopol meadowfoam)
BLBA – *Blennosperma bakeri* (Sonoma sunshine)
LABU – *Lasthenia burkei* (Burke's goldfields)

Attachment 2

Golden Bear Biostudies. 2004. Wetland Delineation Pre-jurisdictional Wetland Determination Vista Bella Project, Santa Rosa, CA (APN 134-132-062). Prepared For Lino Vieira. August 5, 2004.

GOLDEN BEAR BIOSTUDIES

WETLAND DELINEATION

PRE-JURISDICTIONAL WETLAND DETERMINATION
VISTA BELLA PROJECT, SANTA ROSA, CA
(APN134-132-062)

Prepared For:

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By Marco Waaland, Principal Ecologist
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August 5, 2004

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1 BACKGROUND

The project site is located at 3422 Santa Rosa Avenue, and lies east of Highway 101, immediately southeast of the intersection of East Robles Avenue and Santa Rosa Avenue near the southern limits of the City of Santa Rosa (Figures 1&2). The site is on the fringe of southeast Santa Rosa, and is surrounded by older commercial and rural residential type land uses. In general, historical land uses at the site have resulted in compacted gravel in the western half of the site and the vegetation in the remaining portion dominated by non-native weedy species typical of California's upland annual grassland. The project proponent proposes to develop the 4.2-acre parcel (APN 134-132-062) into 20 residential parcels and a 2.16-acre commercial site, which is consistent with current land use designations (Southwest Area Plan, 2002).

The western half of the project site was occupied by a nightclub for the last several decades, which burned down several years ago. This commercial land use and its associated parking areas has resulted in very compacted soil and compacted gravel on the western half of the project site. Although some areas of shallow ponding were observed in the northwest corner of the site, they were not considered jurisdictional due to the compacted and gravelly nature of the underlying substrata and the absence of vegetation. The eastern half of the property is less disturbed is dominated by upland non-native annual grassland. In the southeastern corner of the site there is a moderately large depression with seasonal ponding and a predominance of facultative vegetation. A total of 0.35-acres of seasonal wetlands were delineated in the southeast corner of the site, and along the south property boundary (Figure 4).

Wetlands are subject to federal and state jurisdiction, and are regulated under Sections 401 and 404 of the Clean Water Act (33 U.S.C. Sec. 1344). This report presents the delineation of wetlands occurring at the Vista Bella site. This study has been undertaken because the project proponent ultimately proposes to fill this wetland in order to accomplish their development plans.

2 METHODS

Standard COE wetland delineation procedures as described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987) were used to determine the extent of jurisdictional wetlands. A routine on-site investigation was conducted using the plant community assessment method. Each sample included detailed application of the three-parameter approach (vegetation, hydrology and soils).

The delineation was conducted on April 22, 2004. Additional hydrologic and flora observations were made on March 16 and April 9, 2004. Completed wetland data forms are included in Appendix A. The sample code on each wetland data form corresponds with the transect codes or point samples shown on the jurisdictional wetland map (Figure 4).

Soil pits were dug at 13 locations and examined for evidence of reducing conditions (eg. gleying, mottling, low chroma, etc) (Figure 4). Soil color was determined using a Munsell color chart (Munsell, 1975). The pits were dug to 20 inches depth and visual observations of reducing conditions were recorded. Visual observations of ponding and/or standing water or saturation within 12 inches of the soil surface were recorded on March 16 and April 9, 2004 and were used as indicators of wetland hydrology. The entire wetland areas were completely dry by the time the wetland delineation was conducted on April 22, 2004. Plant species quantities were visually estimated using a releve approach (Mueller-Dombois and Ellenberg, 1974). The National List of Plant Species That Occur in Wetlands: California (Region 0) (Reed, 1988) was used to assign wetland indicator status of species.

3 RESULTS

3.1 ENVIRONMENTAL CHARACTERISTICS

The following discussion examines the three parameters used in making wetland determinations as they relate to environmental characteristics at the site. (Vegetation, Soils, Hydrology).

3.1.1 VEGETATION

Where possible, the vegetation has been classified according to the California Natural Diversity DataBase's Descriptions of the Terrestrial Natural Communities of California (Holland, R. F, 1986).

3.1.1.1 Seasonal Wetland / (Northern Hardpan Vernal Pool; 44110)

DESCRIPTION: At the site three seasonal wetlands occur in a swale complex towards the southeastern portion of the project site (Figure 4). The swale complex appears to flow offsite through an adjacent property to the north (Figure 4). The habitat consists of a low, amphibious, herbaceous community dominated by annual herbs and grasses. Germination and growth begin with winter rains, often continuing even when inundated. Rising spring temperatures evaporate the pools, leaving concentric bands of vegetation that colorfully encircle the drying pool.

The seasonal wetlands at the site are represented by approximately 0.35-acres of adjacent seasonal wetlands that occur in 4 natural depressions and swales of varying size and a ditch in the south west corner of the project site (Figure 4; Table 1). Although a few areas of the wetlands have some characteristics of vernal pool flora, the only dominant native wetland species was semaphore grass *(Pleuropogon californicus*). In general, the wetlands were degraded seasonal wetlands of low-quality habitat. The other wetland plant species consisted of varying amounts of non-native species such as spiny buttercup (*Ranunculus muricatus*), perennial ryegrass *(Lolium perenne)*, meadow barley *(Hordeum brachyantherum*), and curly dock *(Rumex crispus)*.

SITE FACTORS: Based upon data obtained during the spring surveys the site contains adequate hydrology (e.g. long term ponding or saturation) and hydric soils (Wright loams; Figure 3) that support the development of seasonal wetlands. The micro-relief on these soils typically is hummocky, with mounds intervening between localized depressions. Winter rainfall perches on the hardpan, forming pools in the depressions. Evaporation (not runoff) empties the pools in spring.

DISTRIBUTION: "Hogwallow Lands" primarily on old alluvial terraces on the east side of the Great Valley from Tulare or Fresno County north to Shasta County, as well as examples in the Santa Rosa Plains (Cotati Valley) and Sonoma Valley of Sonoma County.

3.1.1.2 Non-Native Grassland (42200)

DESCRIPTION: This plant community is the most extensive at the site (Figure 4; Table 1). It forms a dense to sparse cover of annual grasses with flowering culms 0.2-0.5 (1.0) m high. It is often associated with numerous species of showy-flowered, native annual forbs ("wildflowers"), especially in years of favorable rainfall. Germination occurs with the onset of the late fall rains; growth, flowering, and seed-set occur from winter through spring. With a few exceptions, the plants are dead through the summer-fall dry season, persisting as seeds.

Upland flora dominated by exotic weedy species flourished in the heavily disturbed areas. Although annual grassland is outside wetland boundaries (i.e. upland), the vegetation is dominated by species with “facultative” wetland indicator status (Reed, 1988), such as perennial ryegrass (*Lolium perenne)* and meadow barley *(Hordeum brachyantherum).* As previously mentioned, the most dominant indicators in the wetlands were rabbit’s foot grass and semaphore grass. Upland areas with this predominance were considered as annual grassland areas.

SITE FACTORS: On fine-textured, usually clay soils, moist or even waterlogged during the winter rainy season and very dry during the summer and fall. Statewide, Oak Woodland (71100) is often adjacent on moister, better-drained soils, however, none was present at the site.

DISTRIBUTION: Valleys and foothills of most of California, except for the north coastal and desert regions. It usually occurs below 3,000 feet, but reaching 4,000 feet in the Tehachapi Mountains and interior San Diego County. It intergrades with Coastal Prairie (41000) along the central coast and occurs extensively on uncultivated lands of the Santa Rosa Plains.

3.1.2 HYDROLOGY

The study area is in the Laguna de Santa Rosa drainage basin. The lands of the project site appear to drain via the storm drain system along Santa Rosa Avenue and East Robles Avenue. The site drains to the east into East Fork Todd Creek, which flows into the Bellevue-Wilfred channel to the Laguna de Santa Rosa, and ultimately the Russian River. Wetland hydrology for the site was manifested in two ways: 1) observance of ponding or saturation during spring floral surveys and or 2) observance of indirect evidence of algal mats, sediments and oxidized rhizospheres, matted vegetation, etc. (Environmental Laboratory, 1987). Some algal mats were noted in the seasonal wetlands on April 22, 2004.

3.1.3 SOILS

Following is a description of the soil series identified at the project area. The distribution of soil phases is depicted in Figure 3 (Miller, 1972). The ponded Wright loam phase is mapped as occurring in swale complex towards the southeastern portion of the project site (Figure 4).

3.1.3.1 Geological Context

The project site occurs in a geological feature known as the Cotati Valley on USGS maps, but is commonly known as the Santa Rosa Plains. The valley is a broad, structural trough brought about by the uplift and tilting of large, regional-scale structures (Higgins, 1952). The low hills of the Merced formation on the west side of the valley and the volcanic Sonoma Mountains to the east have uplifted as the valley floor has sunk. The down-faulting of the Santa Rosa Valley, which began approximately one million years ago during the Pleistocene epoch, has helped cause the low gradient of the Laguna de Santa Rosa and its tributaries.

The predominant geologic units in the Cotati Valley are the early and later Pleistocene alluviums. These older deposits occur as remnants of dissected alluvial terraces laid down by streams eroding the volcanic Sonoma Mountains to the east of the Santa Rosa Valley. These deposits underlie the mildly undulating expanse of the Santa Rosa Plains, which supported vast expanses of oak savanna and vernal pools prior to colonization by European Americans. The swales draining these deposits drain into the Laguna de Santa Rosa. North of Santa Rosa Creek, the alluvium is early Pleistocene alluvium (70,000-1.8 million years old) and corresponds with the Huichica loam soil series. South of the creek the alluvium is late Pleistocene (10,000-70,000 years old) in origin and corresponds with the Wright loams.

3.1.3.2 Wright Loam, wet, 0-2% slope (WhA)

Wright loams are very extensive in the Santa Rosa Plains. They are derived from weathered alluvium deposited during the late Pleistocene epoch (10,000 to 70,000 years ago). These soils have undergone formative processes longer than other soils in the Laguna and have a clay subsoil. The soil is 5 or more feet deep with 2 feet of loam or sandy clay loam underlain by clay or a clay hardpan. The wet phase of the Wright loam is the typic phase. These soils are somewhat poorly drained, permeability is very slow in the subsoil and drainage is somewhat poor.

The native vegetation of these soils is valley oak savanna with bunchgrasses and vernal pools interspersed amongst the trees (Waaland 1989a; Waaland et al, 1990). In the past, many of these soils were used for pastures or cultivated as apple and prune orchards. At present, these soils are mainly used for dry and irrigated pasture and hay crops, as well as sites for urban development.

Wright loams per se are not listed as hydric soils, however, unnamed inclusions that occur in depressional landforms are hydric (NRCS, 1992). These depressional landforms are the locations of the high quality vernal pools and swales. The depressions are typically small, closed basins linked by swales which pond water because of the impermeable clay subsoil. These inclusions are considered hydric because they are frequently ponded for long duration or very long duration during the growing season. Vernal pools are almost exclusively found on Wright and Huichica soils in the Santa Rosa Plains (Waaland, 1989a; Waaland et al, 1990). Although seemingly flat from a distance, the Wright loams of the Santa Rosa Plains possess a micro-topography that is quite uneven. This topography is referred to as "hummocky" which means the surface is a gently undulating mosaic of mounds and depressions. The elevation difference between the mound and depressions rarely exceeds 4 feet

3.2 JURISDICTIONAL STATUS OF WETLANDS

A total of 0.35-acres of “adjacent” seasonal wetlands were delineated at the project site (Figure 4). The wetland areas had all three wetland parameters present. Runoff from the site appears to flow offsite towards the east into East Fork Todd Creek, which ultimately flows into the Laguna de Santa Rosa and the Russian River. Therefore, the wetlands may be considered “adjacent” seasonal wetlands and may be subject to Section 404 of the Clean Water Act.

Table 1. Acreage of plant communities and jurisdictional wetlands at the Vista Bella site.

Plant Community	Acreage
Isolated Wetlands	
Seasonal Wetlands	0.35
Uplands	
Annual Grasslands and compacted gravel	3.85
Total Site	4.2

3.3 SPECIAL STATUS SPECIES

3.3.1 SPECIAL STATUS PLANT SPECIES

Vernal pools and seasonal wetlands of the Santa Rosa Plains are habitat for several endemic endangered plants (Waaland, 1989; Patterson et al, 1994; CH2M Hill, 1995). To date, no special status species have been observed at the project site in one year of spring surveys. Additional floral surveys will be conducted in the Spring of 2004.

3.3.2 SPECIAL STATUS ANIMAL SPECIES

Fish and Game approved Ph. D. Ecologist Mike Fawcett to conduct CTS aquatic surveys on the Vista Bella project site to determine if the seasonal wetlands provide CTS breeding habitat. Aquatic surveys were conducted in March and April of 2004 resulting in negative findings. According to Dr. Fawcett, the seasonal wetlands on site do not pond water for a sufficient period to provide adequate breeding habitat. It has been US Fish and Wildlife Service (USFWS) policy to presume presence of CTS aestivation habitat on sites within relative proximity (2 km) to known CTS breeding areas. There are no documented recent records of CTS east of Highway 101 within three miles of the project site.

4 ENDNOTES

EXPLANATION OF HYDRIC SOIL AND HYDROLOGICAL TERMS

The Soil Conservation Service (SCS) has developed a list of soils classified as "hydric" (NTCHS, 1985; SCS, 1992). The National Technical Committee for Hydric Soils has developed the following definition of hydric soils:

"A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation."

Along with hydrophytic vegetation and wetland hydrology, classification of a soil as hydric is one of three attributes needed to qualify an area as a wetland subject to regulation by Section 404 of the Clean Water Act (Federal Register, 1980). The following soils at the site are considered hydric:

The growing season is defined as that time of year when the soil temperatures are above biological zero. Biological zero is defined as 5^{o} C (41^{o} F) (NRCS, 1975). The Huichica loam has a year-round growing season because it is in a "mesic" soil temperature class (i.e. year round soil temperatures are between 8^{o} C (47^{o} F) and 22^{o} C (59^{o} F). Therefore, ponding or saturation within 12 inches of the soil surface for more than seven days at any time of year would be sufficient to meet the wetland hydrology criteria. “Frequently ponded” (or saturated) is defined as a frequency class in which ponding or saturation is likely to occur often under usual weather conditions (i. e. more than 50% chance in any year). “Long duration” means a range from seven days to one month; “very long duration” means greater than one month (NRCS, 1992).

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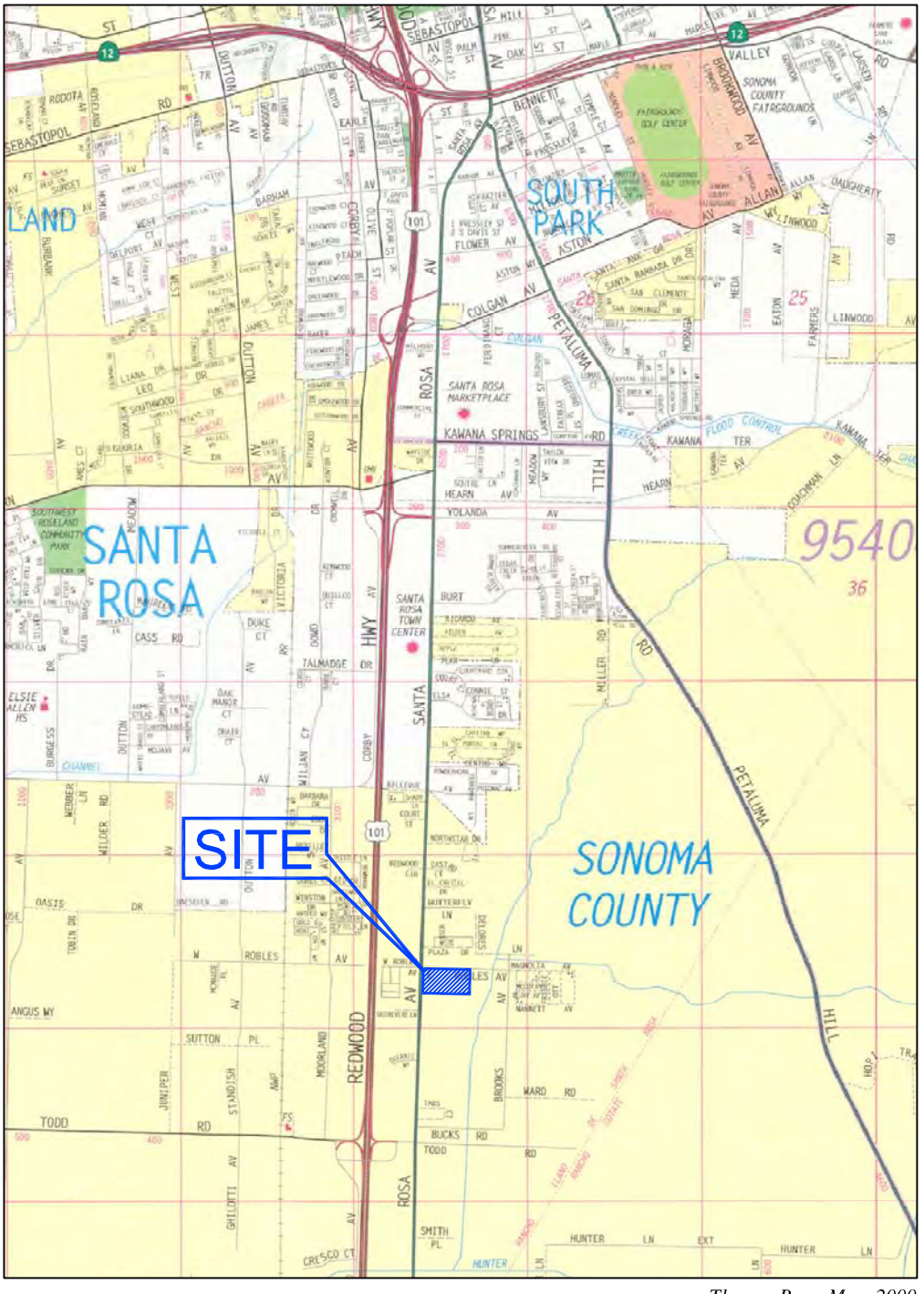
APPENDIX A

Wetland Data Forms

3422 Santa Rosa Ave site



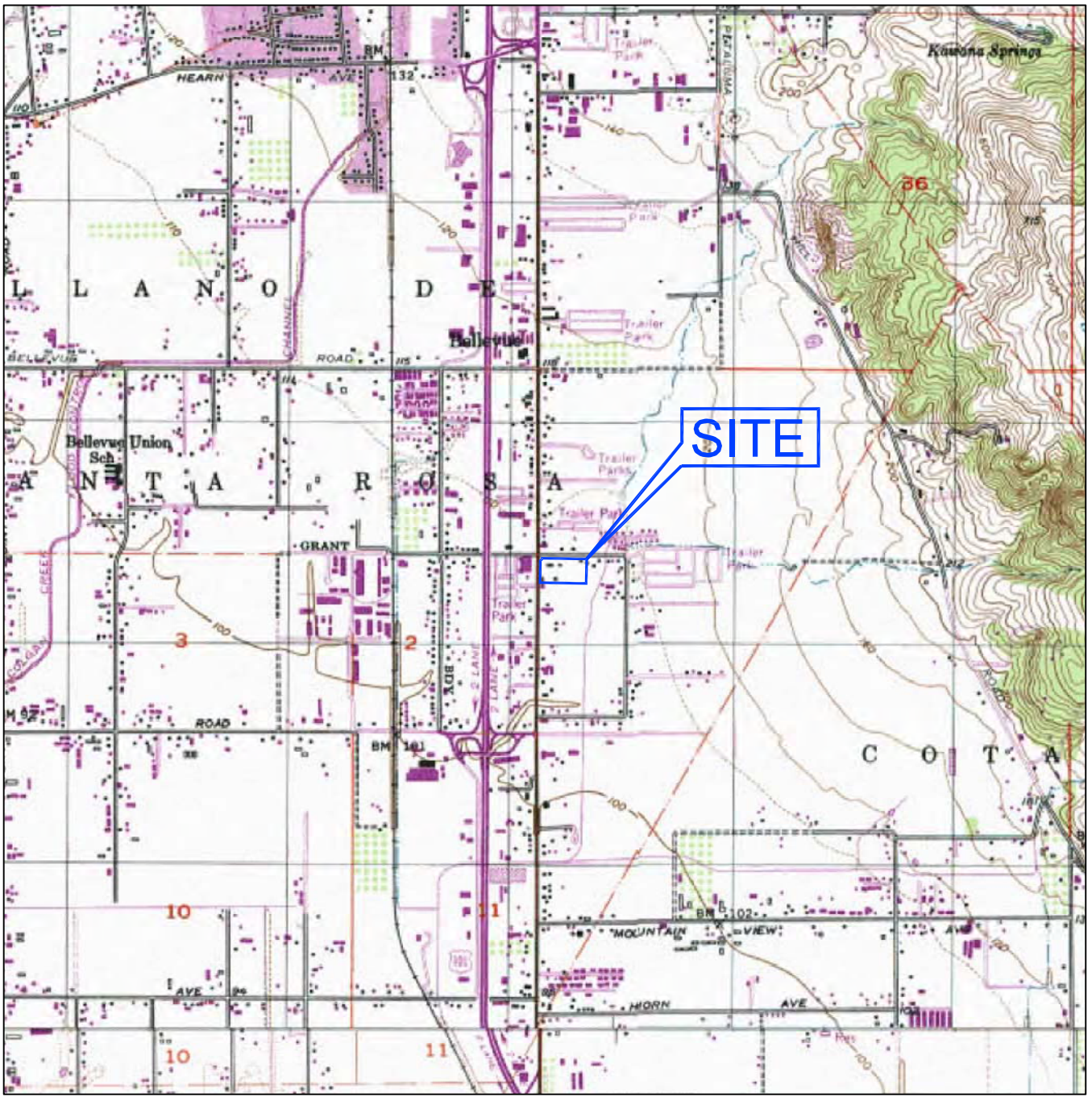
Thomas Bros. Map, 2000

north

FIG. 1 REGIONAL KEY MAP

LINO VIERA PROPERTY
3422 SANTA ROSA AVE.
Santa Rosa, CA

GOLDEN BEAR
BIOSTUDIES
Marco Waaland Ecologist
536 B Street, Santa Rosa, CA
(707) 573-1770 gbb@sonic.net



north

FIG. 2 USGS TOPOGRAPHIC MAP
Santa Rosa Quad

LINO VIERA PROPERTY
3422 SANTA ROSA AVE.
Santa Rosa, CA

GOLDEN BEAR
BIOSTUDIES
Marco Waaland Ecologist
536 B Street, Santa Rosa, CA
(707) 573-1770 gbb@sonic.net

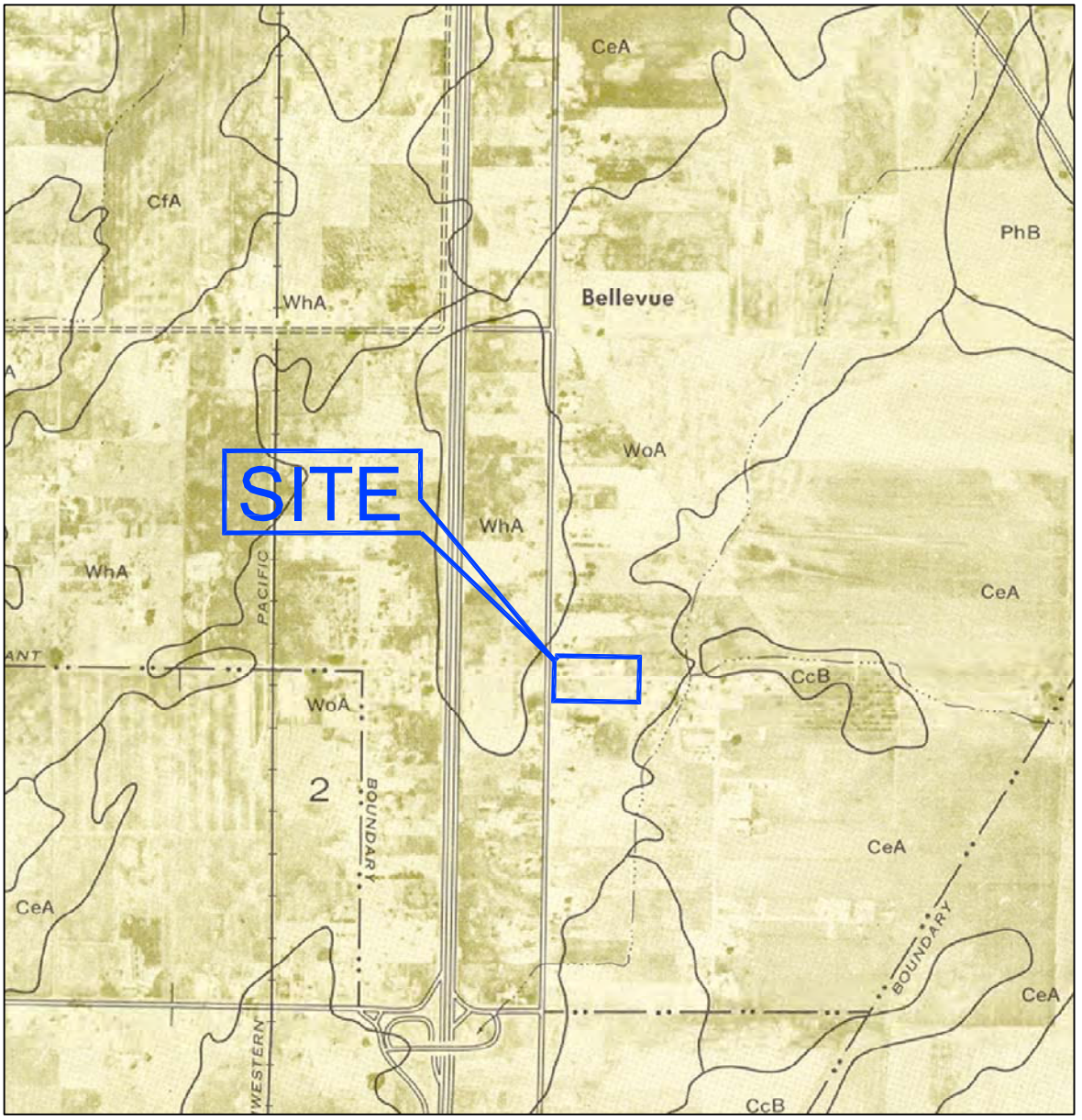
SOILS LEGEND

CeA Clear Lake clay, 0–2% slopes

CcB Clear Lake clay loam, 2–5% slopes

WhA Wright loam, wet, 0–2% slopes

WoA Wright loam, shallow, wet, 0–2% slopes



Source: Sonoma County Soil Survey, Miller, 1972

north

FIG. 3 SOILS MAP

LINO VIERA PROPERTY
3422 SANTA ROSA AVE.
Santa Rosa, CA

GOLDEN BEAR BIOSTUDIES
Marco Waaland Ecologist
536 B Street, Santa Rosa, CA
(707) 573-1770 gbb@sonic.net

LEGEND

JURISDICTIONAL SEASONAL WETLANDS = 0.35 ac

• 5a SAMPLE POINTS

AG ANNUAL GRASSLANDS

FIG. 4
JURISDICTIONAL WETLANDS MAP

LINO VIERA PROPERTY
3422 SANTA ROSA AVE.
Santa Rosa, CA

May 5, 2004

north

0 50'

SCALE: 1"=50'

GOLDEN BEAR BIOSTUDIES
Marco Waaland Ecologist
536 B Street, Santa Rosa, CA
(707) 573-1770 gbb@sonic.net

Attachment 3

Northen, Philip T. 2003. Site Assessment for the Sonoma county California tiger salamander (Ambystoma californiense) on the site of the proposed Vista Bella/Everybody's Talking Project at 3422 Santa Rosa Avene, Santa Rosa, CA (APN 134-132-062). September 8, 2003.

original to Yolanda 9/9/03

September 8, 2003

To: Yolanda Solano
Sonoma County Permit and
Resource Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403
(707)565-2138

From: Philip T. Northen
1480 Cougar Lane
Santa Rosa, CA 95409
(707)539-5333

Subject: Site assessment for the Sonoma County California tiger salamander (*Ambystoma californiense*) on the site of the proposed Vista Bella/Everybody's Talking Project at 3422 Santa Rosa Ave., Santa Rosa, CA (APN 134-132-062)

Dear Ms. Solano:

I was hired by Mr. Leno Viera to do the above-described site assessment for the tiger salamander (abbreviated CTS), which entailed visiting to property to observe whether or not it has the features required to support CTS as well as studying the surrounding areas to determine how they relate to the site in terms of its ability to support CTS. The parcel of land in question is approximately 4.2 acres in size and lies east of Highway 101, immediately southeast of the intersection of East Robles Avenue and Santa Rosa Avenue near the southern limits of the City of Santa Rosa (Figs. 1 and 2). Elevation is 110 feet.

CTS is a mid-sized salamander that spends nearly all of its life underground in the burrows of small mammals like the pocket gopher or in other areas that provide damp subterranean cavities. After growing and maturing in and around these underground retreats for several years, adults emerge at night in late fall during heavy rains to move to vernal pools and other temporary bodies of water to breed. After breeding, adults return to their underground haunts, and, after several months of growth as aquatic larvae, young metamorphose into terrestrial salamanders and also move to underground areas. A site assessment therefore must consider whether or not suitable breeding areas exist, and whether or not there are upland areas with sufficient underground habitat to support the terrestrial phase of the life cycle.

Presence of CTS in the region. There are no documented recent records of CTS east of Highway 101 within three miles of the project site, but there is an anecdotal record of observations within the last five years along Mountain View Avenue about one mile south of it (Dave Cook, personal communication). West of Highway 101, there are a number of sites where CTS have been found recently. The closest of these occurs 1.0 miles southeast of the project site: CTS larvae were found by Trish Tatarian along Ghilotti Avenue south of Todd Road (Northen and Tatarian 2003). A well-known breeding population occurs 1.5 miles southeast of the site on the Haroutunian property south of Scenic Avenue near Highway 101, which is owned by the Sonoma County Agricultural Preservation and Open Space District. Between 1.4 and 3.0 miles from the project site, and west of Highway 101, Northen and Tatarian (2003) reported 25 other sites where CTS breeding has occurred. Most of these are in roadside ditches, and survival of larvae to metamorphosis is unlikely to have occurred in many of these areas because of early drying of the ponded water they contained. However, a few sites, such as a pool in the Southwest Community Park of Santa Rosa near Hearn Avenue, have sustained breeding for a number of years.

Before human activities made portions of the habitat unsuitable, it is clear that CTS occupied the level area of the Santa Rosa Plain both east and west of Highway 101, including the vicinity of the project site. If CTS were to be found now on the project site, therefore, the presence would best be interpreted as continued survival on selected portions of a currently-fragmented habitat.

Features of the site. I examined the site on August 19, 2003. For a good portion of the last several decades, the western half of the property was occupied by a night club ("Everybody's Talking"), which I am informed burned down a decade or more ago. On the property, one finds very compacted soil and compacted gravel where this night club and its associated parking areas used to be. This portion of the site is not suitable for CTS because it has no breeding ponds and is also nearly devoid of the kinds of small mammal burrows that are used by CTS as subterranean habitat during the non-breeding portion of the species' life cycle.

By contrast, the eastern half of the property (approximately) has an abundance of pocket gopher burrows and therefore could support the terrestrial existence of CTS. Plant species that were abundant in this area were mostly non-natives such as Prickly ox-tongue (*Picris echioides*), Blue sailors (*Chicorium intybus*), Italian ryegrass (*Lolium multiflorum*), curly dock (*Rumex crispus*), Harding grass (*Phalaris aquatica*), sweet fennel (*Foeniculum vulgare*), and wild oats (*Avena sp.*). Some of these species are typical of areas with some water-saturation of the soil in winter (*Picris, Lolium, Rumex, Phalaris*), while the others characterize drier uplands. According to the Sonoma County Soil Survey (Miller 1972), the entire site is underlain by the soil series "Wright Loam, wet, 0 to 2 percent slopes," a soil series known to support vernal pool wetlands.

In the far southeastern corner of the property there is a moderately large vernal pool that I paced off to be about 225 feet long by 90 feet wide. This appears to be a natural

pool that is a remnant of a larger vernal pool ecosystem that probably existed over a wide area prior to human occupation. I could not estimate the depth of this pool, but it is possible that it could retain moisture into late spring as required by CTS for metamorphosis of larvae. The only other area where water is likely to pond in winter is a shallow ditch along East Robles Avenue immediately north of the site, but this ditch is too shallow to support breeding.

Plant species evident in this pool during my visit were all wetland types: curly dock, coyote thistle (*Eryngium aristulatum*), pennyroyal mint (*Mentha pulegeum*), and lamb's quarters (*Chenopodium album*). Of these, only coyote thistle is native. A full floral survey in the spring would be likely to detect other native and non-native plants.

Characteristics of the surrounding area. The aerial photograph at the end of this letter (Fig. 2) shows the site as it existed in 1980. I have found this photo series from the County of Sonoma to be especially good at highlighting recent wetland features.

All of the areas between the site and Highway 101 to the west are fully urbanized, primarily with retail stores and other commercial sites. These areas could not support CTS. To the east and north of the site one finds residential/rural residential areas, including a trailer park along Brooks Avenue east of the site. The ability of these housing areas to support the terrestrial existence of CTS ranges from none in the trailer park to slight in the residential areas. Immediately south of the site lie three open parcels that seem to have similar characteristics to the project site as judged by viewing them from their perimeters. There thus appears to be some potential to provide additional habitat for the species south of the site. If the vernal pool on the project site were suitable for breeding, salamanders that use it for such could find refuge on land in these other areas. I estimate the total upland habitat that is potentially suitable for CTS on these parcels to be 10-15 acres. I did not have access to the adjoining properties, hence cannot say whether they do or do not have potential breeding habitat.

Directly south of the southernmost of these just-described parcels is another about five acres in size that is fully occupied by a recently-constructed self storage facility. This facility extends from Santa Rosa Avenue on the west to a small trail adjacent to a flood control channel (described below) on the east.

Between Santa Rosa Avenue and Brooks Avenue, just east of the project site, there is an unnamed creek that runs in a flood control channel. This channel runs south from East Robles Avenue to East Todd Road, then further south 0.4 miles, then west under Highway 101. The channel is about six feet deep and has steep sides. The bottom along the creek has very dense vegetation consisting of stands of cattails, mounds of Himalayan blackberry, thick woods of willow and black walnut, and areas with tall grasses and weeds. In a period of light rain, when channel flows are moderate, the steepness of the sides and thickness of vegetation would make it difficult for CTS to cross this channel. In heavy rains, such as occur during most CTS breeding migrations, the channel could have a strong enough current to sweep downstream any salamander attempting to cross it.

Southeast of the parcels that lie adjacent to the project site, but across the channel, there are several open lands of 20 acres or more that could provide habitat for CTS. However, because of the features of the channel just described, I believe that the channel is a significant barrier to movement of CTS to and from the project site to these eastern areas.

The combined effect of the land uses surrounding the project site and the channel mean that the potential habitat on and just south of the site is an isolate of 10-15 acres. The salamander would have to depend entirely, or nearly so, on features of this small area to sustain it over the years.

Conclusion and Recommendation. I believe it to be very unlikely that the project site has CTS on it. There is a very small possibility, however that a small breeding population of CTS could occur on and adjacent to the site, so it may be necessary to do surveys during the upcoming wet season. The ultimate decision as to whether or not surveys should be performed lies with the U.S. Fish and Wildlife Service. The contact person in this agency is Dan Buford (916)414-6600. In my opinion, if surveys are required, one season of work should be sufficient, provided 2003/04 is a normal rainfall year. To assess whether or not breeding occurs in the vernal pool, a single dip-net survey during March or April of 2004, when CTS larvae would be expected to occur in the pond, should be sufficient. To determine whether CTS move onto the site for breeding, or off of the site to breed in a yet-undetected area, a drift fence along the eastern half of the southern boundary of the site should provide the requisite information. This fence, if required, should be installed according to U.S.F.W.S. specifications before significant rains occur, and should be checked during each rain event until the time window for breeding has past.

Feel free to contact me if you have any questions regarding this assessment.

Sincerely yours,

Philip T. Northen, Ph.D.
Biologist

Literature Cited:

Miller, V. 1972. Soil Survey of Sonoma County. U.S.D.A. 188 pp.

Northen, P. and T. Tatarian. 2003. Unpublished Biological and Site Assessment for the Sonoma County tiger salamander (*Ambystoma californiense)* on the site of the proposed Todd Road Reconstruction and Widening Project. Prepared for the Sonoma County PRM Department.

✓ Copy to Lino Viera

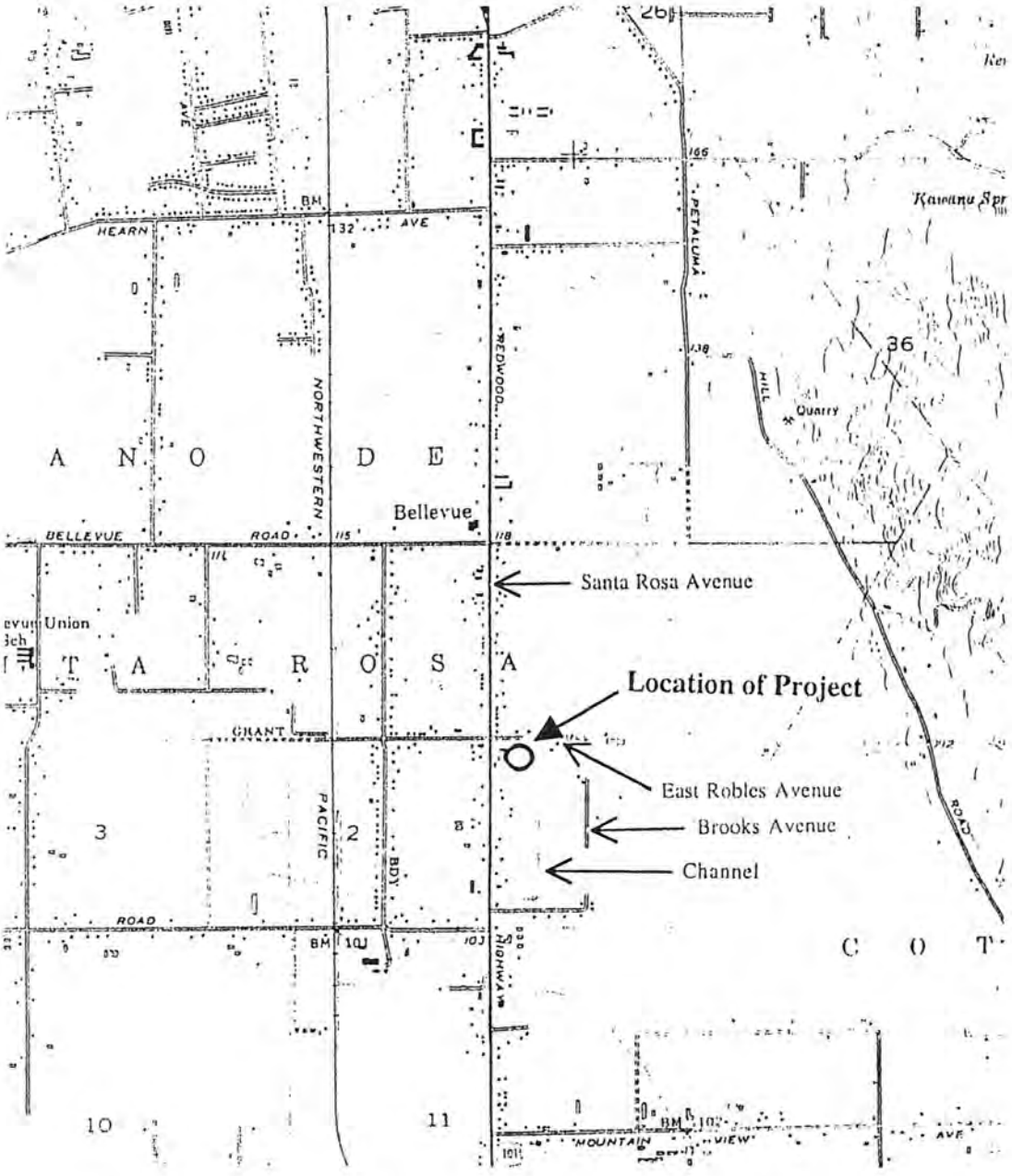


FIGURE 1. Portion of the U.S.G.S. topographic map of the Santa Rosa Quadrangle (1954, 7.5 minute series) showing the location of the site.