BIOLOGICAL RESOURCE ASSESSMENT

POTABLE WATER TANK

AND

ACCESS ROAD

Prepared for:

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1.0 PROJECT DESCRIPTION

1.1 Project Description

The potable water tank will be located on the side of a small hill east of Petaluma Hill Road (Figure 1). The access road will extend from Petaluma Hill Road to the water tank, approximately 2,515 feet to the east. There is a small drainage near the base of the hill on which the potable water tank will be located and this drainage will be spanned by a small bridge.

The project site is located within the Sonoma County directly east of Petaluma Hill Road approximately 1,000 feet south of Rohnert Park Expressway. The site is currently within the Diverse Agriculture District and is primarily used for cattle grazing. The main channel of Copeland Creek flows east-west through the property.

The potable water tank will consist of an 833,000 gallon gravity water tank with a roadway surrounding the tank, and the access road to the tank will consist of a 15-foot maximum width asphalt-paved road. The water main required to both fill the tank as well as supply water to the Vast Oak project site will be located underneath this access road.

The water tank will be located in an area to be excavated on the hillside and the excess of soil material hauled to a suitable disposal site. No trees will be removed or destroyed during construction of the access road or the water tank.

1.2 Project Implementation

The project will occur in two phases; the first, creating both the access road and water tank pad and the second, installing the potable water main and constructing the water tank.

During the first phase, excavation will occur on the tank site and spoils will be hauled to an acceptable disposal site. A small retaining wall will be constructed in order to reduce the required grading and minimize the project footprint. During this phase the access road will be rough graded to allow for materials and personnel to access the construction site.

Best Management Practices (BMPs) will be implemented during the grading operation, including construction entrances to prevent dirt from entering Petaluma Hill Road and to minimize dust. The BAAQMDs feasible PM10 control measures for construction activities will, according to the County's practice, be included as a note on all construction plans, including the grading permit. This project will cover all trucks run on public roadways and water down disturbed areas on the project to prevent any unnecessary dust. Sweepers will also be utilized to prevent accumulation of soil on public roadways. Water from water sweepers shall be contained on-site and not discharged directly to the creek.

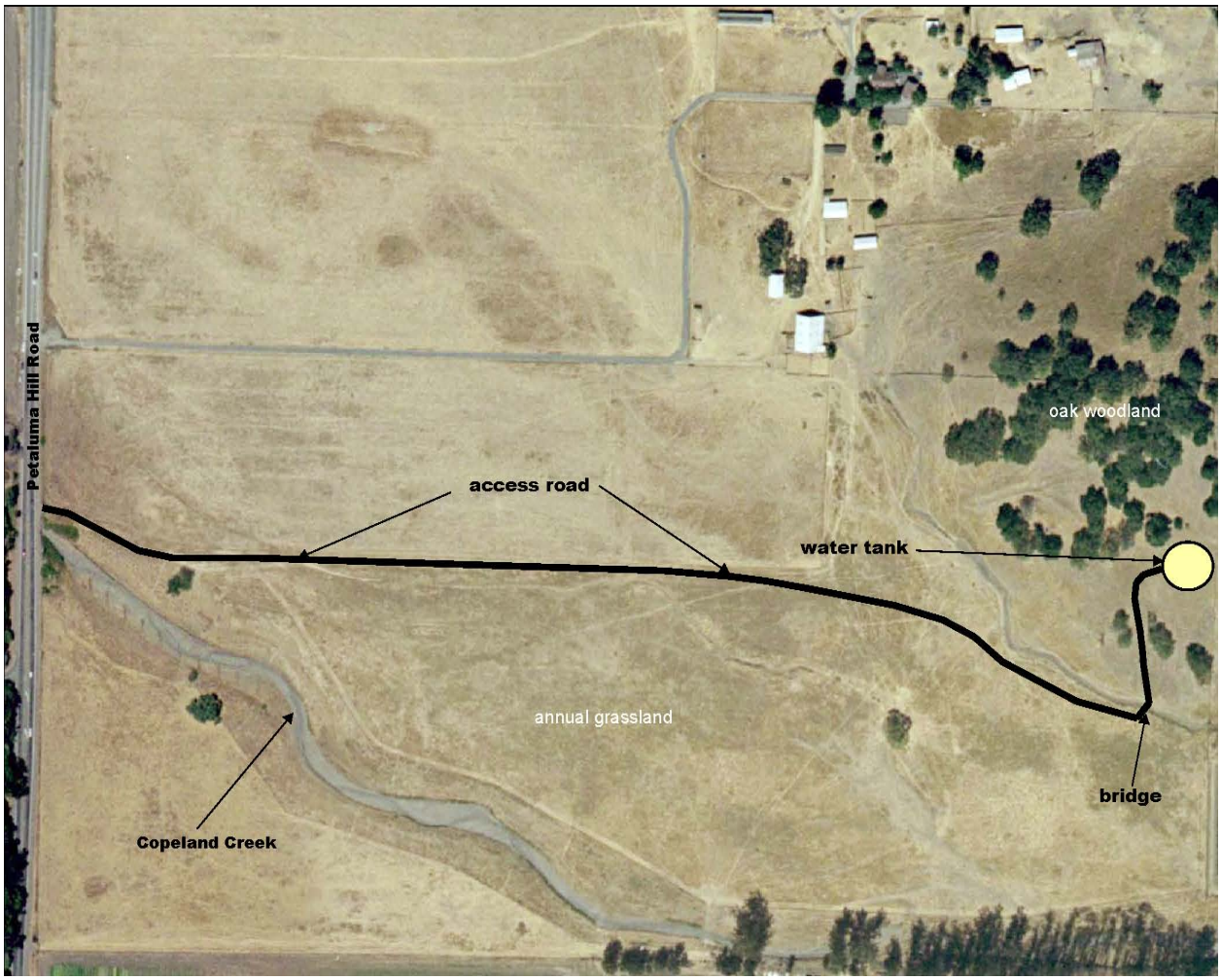


Figure 1. Potable water tank and access road project area.

Trucks will enter and exit the project site from Petaluma Hill Road through an existing gate. Hauling will only occur during those times specified by the County Traffic Engineer to prevent disruptions in the City's traffic flow patterns. The trucks will travel over paved surfaces, dislodging gravel from the truck wheels prior to entering public roadways. The project proponent will repair any substantial damage occurring on public roadways as a result of this truck traffic.

Although some work will occur adjacent to Copeland Creek and its surrounding watershed, the project will not increase the potential for erosion downstream and will not negatively impact the capacity of the creek through implementation of the required BMPs as outlined in the agency-approved storm water pollution prevention plan developed for the project. Erosion control measures will be installed along both the access road and water tank site. All erosion control facilities and BMPs will remain in place until the completion of the site grading and improvements, and until the exposed soil surfaces have re-vegetated sufficiently to prevent erosion.

Construction of the access road and potable water tank will require a grading permit from Sonoma County.

1.3 General Project Area

The site is a mosaic of annual grassland, oak woodland, and seasonal wetland. Hinebaugh Creek crosses to the north of the site and Copeland Creek runs south of the site Figure 1). The site is currently used to graze cattle and sheep and is surrounded by other undeveloped lands used also for grazing, agricultural crop production, or passive recreation (Crane Canyon Regional Park). Sonoma State University occupies a site on the west side of Petaluma Hill Road, directly across the road from the entrance to the access road to the potable water tank.

The soils in the western part of the site are mapped by the Soil Conservation Service as Clear Lake clays and clay loams. The Clear Lake clay and clay loam soils developed in mixed alluvial material on plains and flat basin areas under poorly drained conditions. These soils are characterized by heavy clay content throughout the profile. The clay in both soils is as much as five feet thick, underlain by clay loam. The clay acts as a water-restricting horizon, causing water to accumulate in the surface soils and above ground in depressional terrain such as the headwater swales and vernal pools. Regardless of the designated status, Clear Lake soils are commonly found to be hydric in the absence of local management practices that modify surface and near-surface hydrologic conditions.

The soils on the hilly terrain in the eastern part of the site are Toombs rocky loam. Goulding cobbly clay occurs on the lower slopes and in the valley on the north side of the hills. Both the Toombs and Goulding soils are upland soils.

2.0 BIOLOGICAL RESOURCES

The following discussion of biological resources in the project area is taken from the following two sources, which have been appended to this SUMMARY report:

RESULTS OF 1998 SURVEY FOR SPECIAL-STATUS PLANT SPECIES, VAST OAK EAST, SONOMA COUNTY, CALIFORNIA, Submitted to Mr. Craig Harrington, Quaker Hill Development Corporation, Healdsburg, CA, Prepared by Laurence P. Stromberg, Ph.D. dated June 30, 1998.

HABITAT ASSESSMENT AND FIELD STUDIES FOR SPECIAL-STATUS WILDLIFE, VAST OAK PROJECT SITE, SONOMA COUNTY, CALIFORNIA, Submitted to Mr. Craig Harrington, Quaker Hill Development Corporation, Healdsburg, CA, Prepared by Biosearch Wildlife Surveys dated November 29, 2000.

In addition to these documents, which are appended to this report, two biological assessments were prepared to address impacts related to construction of the Vast Oak project, just west of Petaluma Hill Road and north of Rohnert Park Expressway. One of the biological assessments addressed possible impacts to the threatened California tiger salamander and the other biological assessment addressed possible impacts to listed plant species and invertebrate, fish and other wildlife species. The study area for the studies that supported the findings of the biological assessment included the property area where the potable water tank and access road will be constructed. The biological assessments f included the following:

BIOLOGICAL ASSESSMENT CALIFORNIA TIGER SALAMANDER (*Ambystoma californiense***)** *VAST OAK PROPERTIES ROHNERT PARK, CA*, Submitted to U.S. Fish and Wildlife Service c/o U.S. Army Corps of Engineers by Vast Oak Properties, dated July 2003

PRELIMINARY BIOLOGICAL ASSESSMENT FOR VAST OAK PROPERTIES, UNIVERSITY SPECIFIC PLAN AREA, ROHNERT PARK, CA, Submitted to: U.S. Fish and Wildlife Service and National Marine Fisheries Service c/o U.S. Army Corps of Engineers by Vast Oak Properties. Dated September, 2003

2.1 Habitat

Seasonal Wetlands. Compositionally, the seasonal wetlands are quite varied. The species found most commonly are popcorn flower (*Plagiobothrys stipitatus*), ryegrass (*Lolium perenne*), tidytips (*Layia chrysanthemoides*), curly dock (*Rumex crispus*), and Mediterranean barley (*Hordeum marinum* var. *gussoneanum*). In the wetter areas (ie., in the seasonal wetlands in the creeks located outside the project area), pennyroyal (*Mentha pulegium*), California semaphore grass (*Pleuropogon californicus*), brown-headed rush (*Juncus phaeocephalus*), water starwort (*Callitriche marginata*), Douglas meadowfoam (*Limnanthes douglasii*), and monkey flower (*Mimulus guttatus*) are also present.

Defined Drainages. The drainage at the base of the hill just below the location of the potable water tank has a total area of 7,154 s.f. (0.164 acres) and varies in width from five to 19 feet. The bottom is 16 inches to three feet below the banks where the drainage is defined. The deeper

areas are depressional, hold water longer, and are ponded throughout the winter rainy season. Where hydrophytic vegetation is present, the wetland is dominated by tall flatsedge. Rabbitsfoot grass, pennyroyal, curly dock, and spikerush (*Eleocharis macrostachya*) are locally dominant. Subdominant species include ryegrass, bermuda grass (*Cynodon dactylon*), fiddle dock, purple loosestrife (*Lythrum hyssopifolium*), and cocklebur.

The second partially defined drainage forms in the southeast quarter of the field, across which the access road will be constructed, crosses through the center of the field, parallels the northern property line, and then is "captured" by an abandoned access road into the area from a gate along Petaluma Hill Road (where the access road to the potable water tank will originate). The drainage has a total area of 18,819 s.f. (0.431 acres), is defined except for the western 615 feet, and varies in width from three to 12 feet. The average width increasing downgradient from east to west, and becoming widest within the limits of the access road. The vegetation is dominated by ryegrass and California semaphore grass. Subdominant species include rabbitsfoot grass, little rattlesnake grass, fiddle dock, curly dock, bur clover (*Medicago polymorpha*), toad rush (*Juncus bufonius*), and subterranean clover.

Annual Grassland. The annual grassland which make up most of the field that will be crossed by the access road is dominated by the typical array of annual introduced grasses, including ryegrass, soft chess (*Bromus hordeaceus*), hare barley (*Hordeum murinum* ssp. *leporinum*), ryegrass, oats (*Avena fatua* and *A. barbata*), and ripgut brome (*Bromus rigidus*). Cutleaf geranium (*Geranium dissectum*), filarees (*Erodium* spp.), butter and eggs (*Triphysaria eriantha*), parentucellia (*Parentucellia viscosum*), blue dicks (*Dichelostemma capitatum* ssp. *capitatum*), Ithuriel's spear (*Triteleia laxa*), dog fennel (*Anthemis cotula*), mustards (including *Sisymbrium irio* and *Brassica campestris)*, and wild radish (*Raphanus sativus*) are among the more common forbs in the grassland.

On the shallower soils on the hillsides, several species not found in the finer-textured lowland soils were present. These include larkspur (*Delphinium decorum*), California poppy (*Eschscholzia californica*), catchfly (*Silene gallica*), purple owl's clover (*Orthocarpus purpurascens*), bracken fern (*Pteridium aquilinum*) and poison oak (*Toxicodendron diversiloba*) (both found around rock outcrops), gilia (*Navarretia intertexta*), fiddleneck (*Amsinckia intermedia*), dogtail grass (*Cynosurus echinata*), and soap plant (*Chlorogalum pomeridianum*).

Oak Woodland. The oak woodland occurs on the upper slopes of the hill in the eastern part of the Vast Oak site. The tree species include coast live oak (*Quercus agrifolia*), buckeye (*Aesculus californica*), and Garry oak (*Quercus garryana*). Poison oak and snowberry (*Symphoricarpos* sp.) occur in the understory. The woodland is a relatively open community although it is characterized by an almost closed canopy near the ridge line.

Jurisdictional Wetlands. The location and extent of wetlands potentially subject to the jurisdiction of the U.S. Army Corps of Engineers (Corps) pursuant to section 404 of the Clean Water Act are shown in Figure 2. The delineation report isfinalized and will be submitted on May 27, 2005 to the Corps for its verification but the extent and location of wetlands indicated on Figure are a fair representation of wetland occurrence in the project area.

Special-status Plant Species. The potable water tank site and access road are located east of Petaluma Hill Road on the north side of Copeland Creek. The only species observed in the areas studied east of Petaluma Hill Road (the Anderson 128) was Lobb's aquatic buttercup, which was observed in a vernal pool in the southeast corner of the Anderson 48 site, which is outside the project boundary for the potable water tank and access road. The findings of rare plant surveys conducted By Dr. Laurence Stromberg in 1995, 1997, and 1998 surveys are a sufficient basis for determining that, except for Lobb's aquatic buttercup, no special-status plant species are present on the project site.

2.2 Wildlife

Several special-status vertebrate species occur or historically occurred in the region and were determined to have the potential to inhabit the project site. The California Department of Fish and Game (CDFG) reported observations of steelhead in Copeland Creek and this was confirmed by studies conducted by ENTRIX for the University Specific Plan Area. The project site is outside the range of the federally threatened California red-legged frog as delineated by the U. S. Fish and Wildlife Service and none have been detected during four years of focused surveys. The small drainage at the bottom of the hill below the location of the potable water tank was surveyed on multiple occasions for California tiger salamander (CTS) larvae and none have been found. The U.S. Fish and Wildlife Service found that development of the Vast Oak project would not likely to result in a take of the CTS.

The primary wildlife habitat in the project area is non-native annual grassland that is currently used for grazing cattle and sheep. The far northern part of the site is used to grow row crops. A hill rises steeply in the southern portion and supports oak woodland and oak savannah. Copeland Creek, where it forms a portion of the southern edge of the site, is degraded and contains no riparian vegetation. A line of eucalyptus trees is present along this portion of Copeland Creek. A seasonal swale that contains several small pools flows around the south side of the hill below the location of the potable water tank and drains into Hinebaugh Creek some distance to the north of the project site. Residences and associated structures are located on the northwestern side of the hill. Several non-native trees are present in this area. The parcel abuts Crane Creek Regional Park on the east. and open space is currently present to the north and south as well.

Five other special-status species were observed in the project area, as described in the report prepared by Biosearch Wildlife Surveys. The white-tailed kite. a CDFG fully protected species. was observed foraging and roosting both east and west of Petaluma Hill Road. Potential nesting habitat for this species is present along Copeland Creek and in the oaks in the project area, although it did not nest in these oaks in 1994 or 2000. The grasshopper sparrow, listed as a U.S. Fish and Wildlife Service (USFWS) Migratory Non-game Bird of Management Concern, was observed during the nesting season in 2000 in the grasslands east of Petaluma Hill Road and in fallow fields west of Petaluma Hill Road. The foothill yellow-legged and western pond turtle, CDFG protected species and species of special concern, and the yellow warbler, a CDFG species of special concern and USFWS Migratory Non-game Bird of Management Concern, were observed along Copeland Creek.

Suitable habitat is present, and recent records exist in the region, for other special-status wildlife, including Cooper's hawk, loggerhead shrike, California horned lark. pallid bat and Townsend's big-eared bat. The rest of the species under consideration have a low likelihood of inhabiting the study site due to the lack of breeding, nesting or wintering habitat, the lack of recent records from the region, and/or the lack of observations during focused surveys.

The foothill yellow-legged frog and western pond turtle, CDFG protected species and species of special concern, and the yellow warbler, a CDFG species of special concern and USFWS Migratory Non-game Bird of Management Concern, were detected along Copeland Creek primarily west of Petaluma Hill Road and the project area but there was a sighting of foothill yellow-legged frog in Copeland Creek just east of the Petaluma Hill Road culvert. Foothill yellow-legged frogs must escape high waters during the winter and have been recorded up to 150 feet from aquatic habitats. Western pond turtles also must escape high water and will travel up to 2,500 feet to construct nests in grasslands, agricultural fields and other open habitats.

While suitable nesting habitat for the yellow warbler is present along Copeland Creek west of Petaluma Hill Road. Copeland Creek in the eastern portion of the site lacks riparian cover, and does not provide habitat for yellow warblers. The Cooper's hawk, California horned lark, loggerhead shrike, pallid bat, Townsend's big-eared bat and Yuma myotis are considered to have a moderate potential to inhabit the project area during the breeding season. The ferruginous hawk has a moderate potential to occur on the site during the winter. The rest of the specials-status species under consideration are considered to have a low potential to inhabit the project area due to the lack of breeding, nesting or wintering habitat, the lack of recent records from the region, and/or the lack of observations during focused surveys.

3.0 PROJECT IMPACTS AND MITIGATION

3.1 Project Impacts

Construction of the access road will directly impact approximately 0.064 acres of seasonal wetlands (see Figure 2 for location of seasonal wetlands) and 0.611 acres of annual grassland habitat and construction of the potable water tank will impact approximately 0.268 acres of annual grassland habitat associated with the oak woodlands on the hill site. The seasonal wetlands and annual grassland habitat has been subject to grazing for many years and as a result are degraded and offer poor habitat quality. The impacts of construction and operation of the access road and potable water tank will be limited to the immediate area of direct impacts and little indirect impacts are expected. The access road will not be subject to frequent travel.

The access road may prevent some over land flow that contributes to the hydrology of the seasonal wetlands on the remainder of the flat land areas south of the access road direct rainfall and overland flow from the surrounding area should be sufficient to maintain the hydrology of the remainder of the seasonal wetlands in the vicinity of the project.

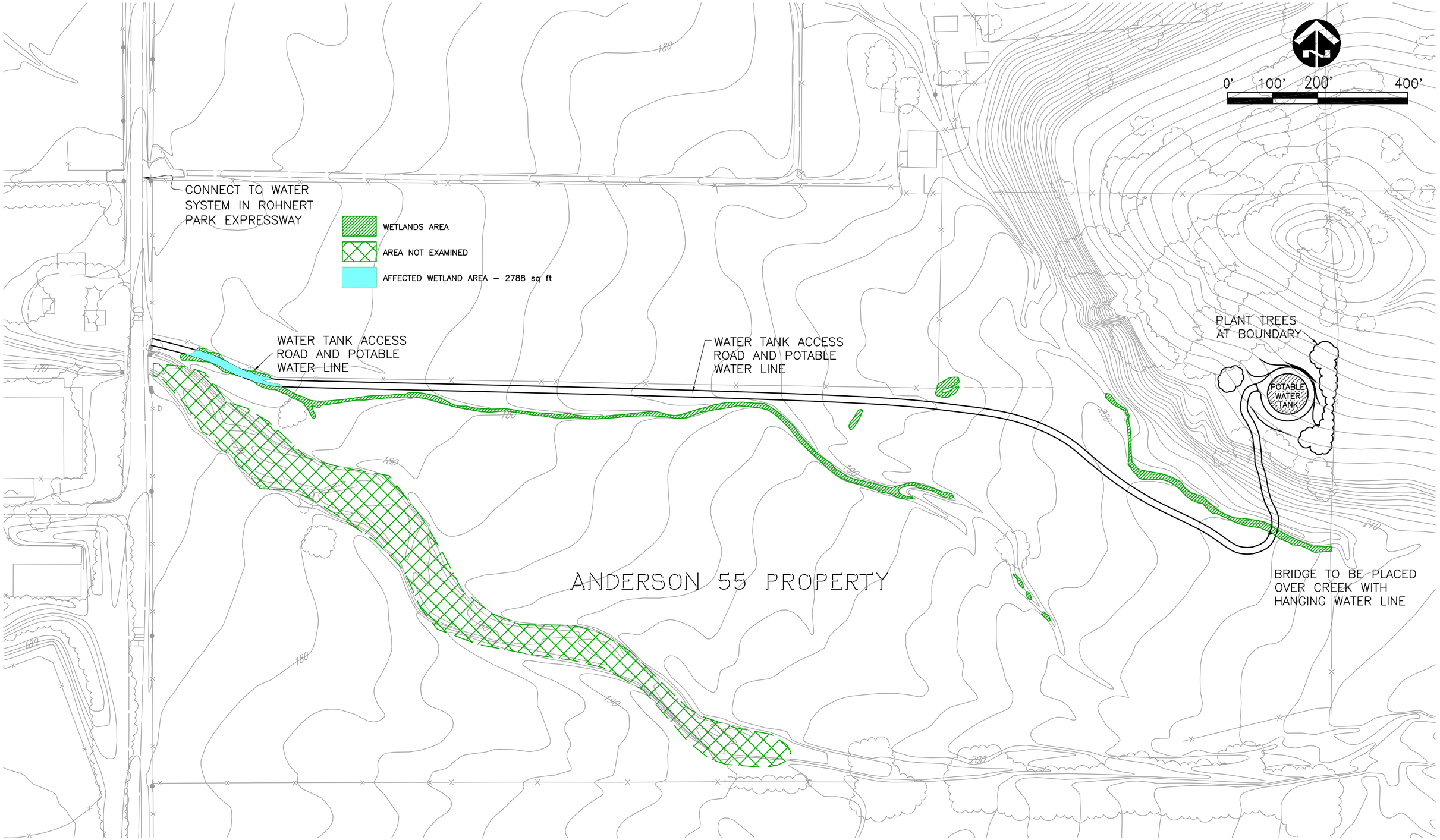
3.2 Mitigation

Impacts to the approximately 0.064 acres of degraded seasonal wetlands will feasibly be mitigated by one of the following means:

- the applicant has existing credits purchased from the agency approved Hale Wetlands Mitigation Bank, which are more than sufficient to offset fill of 0.064 acres; or

- the applicant is under contract to purchase the credits from the proposed Hazel Mitigation Bank once the bank is approved by the agencies; or

- the applicant is proposing construction of wetlands on nearby property controlled by the applicant to offset fill of wetlands for the Vast Oak project and it should be feasible to construct an additional 0.064 acres at one of these sites.



ANDERSON 55 - POTABLE WATER TANK

ROHNERT PARK CALIFORNIA

Figure 2. Project impacts to wetland habitat.

ATTACHMENTS

RESULTS OF 1998 SURVEY FOR SPECIAL-STATUS PLANT SPECIES, VAST OAK EAST, SONOMA COUNTY, CALIFORNIA, **SUBMITTED TO MR. CRAIG HARRINGTON, QUAKER HILL DEVELOPMENT CORPORATION, HEALDSBURG, CA, PREPARED BY LAURENCE P. STROMBERG, PH.D. DATED JUNE 30, 1998.**

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Wetlands Consultant

59 Jewell Street, San Rafael, CA 94901 **Tel. & Fax: (415) 721-0700**

RESULTS OF 1998 SURVEY FOR SPECIAL-STATUS PLANT SPECIES, VAST OAK EAST, SONOMA COUNTY, CALIFORNIA

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July 30, 1998

Analysis Endangered Species Surveys

RESULTS OF 1997 SURVEY FOR SPECIAL-STATUS PLANT SPECIES VAST OAK EAST, SONOMA COUNTY, CALIFORNIA

1.0. SUMMARY

This report presents the results of a survey conducted in the late spring of 1998 at the request of Mr. Craig Harrington of Quaker Hill Development Corporation for special-status plant species on the Vast Oak East site east of the Petaluma Hill Road near Rohnert Park. The Vast Oak East site is 213.6 acres and comprises A. P. Nos. 047-132-12, 047-132-29, and 047-132-02, the latter referred to in previous reports as the "Anderson 48."

The Vast Oak East site is a mosaic of annual grasslands, vernal pools (Anderson 48 only), seasonal wetlands, defined drainages, and oak woodland surrounded by lands which, with the exception of California State University at Sonoma to the southwest across Petaluma Hill Road, are essentially undeveloped. Although they have not been delineated as part of this report, the seasonal wetlands and defined drainages are jurisdictional habitats subject to the regulatory authority of the U. S. Army Corps of Engineers.

Previous surveys of the site or parts thereof have been conducted by Waaland (1992, 1993) and Stromberg (1995a, 1995b, 1997). The sole special-status plant species observed in these surveys has been Lobb's aquatic buttercup (*Ranunculus lobbii*), a list-4 species, in a vernal pool in the southeast corner of the Anderson 48 site. The species has been observed in the same vernal pool in 1995, 1996 (a year for which no survey was conducted but during which observations were made), and 1997.

2.0. INTRODUCTION

2.1. SITE LOCATION AND PHYSICAL DESCRIPTION

.The Vast Oak East site is located northeast of the City of Rohnert Park. It is situated in the watersheds of Hinebaugh and Copeland Creeks, east of the intersection of Petaluma Hills Road and Rohnert Park Expressway (Figure 1). The Vast Oak East site is outside the limits of study for the Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan in preparation by CH2M Hill (CH2M Hill 1995) for the Santa Rosa Plain Vernal Pool Task Force and the area over which the Corps of Engineers has conditioned its Nationwide Permit 26.

The site is a mosaic of annual grassland, oak woodland, and seasonal wetland. Hinebaugh Creek crosses the northeastern part of the site, exiting the Vast Oak site and reentering it downstream in the Anderson 48. Copeland Creek runs along the southern boundary in the southwest part of the site. The site is currently used to graze cattle and sheep and is surrounded by other undeveloped lands used also for grazing, agricultural crop production, or passive recreation (Crane Canyon Regional Park). Sonoma State University occupies a site on the west side of Petaluma Hill Road, directly across the road from the southernmost field in the Vast Oak East site.

The western half of the Vast Oak East site is relatively level to slightly rolling ground. The eastern half of the site, which abuts Crane Canyon Regional Park and forms the head watershed of Hinebaugh Creek, is steep, hilly land with shallow parent rock and many outcrops.

The soils in the western part of the site are mapped by the Soil Conservation Service as Clear Lake clays and clay loams (U. S. Department of Agriculture 1972). The Clear Lake clay and clay loam soils developed in mixed alluvial material on plains and flat basin areas under poorly drained conditions. These soils are characterized by heavy clay content throughout the profile. The clay in both soils is as much as five feet thick, underlain by clay loam. The clay acts as a water-restricting horizon, causing water to accumulate in the surface soils and above ground in depressional terrain such as the headwater swales and vernal pools. Regardless of the designated status, Clear Lake soils are commonly found to be hydric in the absence of local management practices that modify surface and near-surface hydrologic conditions. Investigations conducted during the winter and spring of 1997-98 revealed that the soils in the field at the southern end of the Vast Oak East site include thick cobble lenses which carry infiltrated water toward Copeland Creek and elsewhere, leaving the surface soils drier than would be expected.

The soils on the hilly terrain in the eastern part of the site are Toombs rocky loam. Goulding cobbly clay occurs on the lower slopes and in the valley on the north side of the hills. Both the Toombs and Goulding soils are upland soils.

3.0. METHODS

The target species for which the survey was conducted are the special-status species listed in the draft Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan prepared for the Santa Rosa Plain Vernal Pool Task Force (CH2M Hill 1996) and identified in California Natural Diversity Data Base records. Target species include those species whose range includes the region and which, by virtue of their known occurrence in the vicinity, were considered to have the potential to occur on the site given their habitat requirements and the types of habitat present. These species are listed in the table in Appendix A.

The field survey was conducted by thoroughly searching each wetland and conducting a transect survey of the riparian and annual grassland habitats on April 8, April 30, and May 24,1998. Because of the heavy winter and spring rainfall, the site visits were conducted later than usual, but well within the "window" during which virtually all target species were either in flower or would be readily identifiable to species. These habitat types are briefly described in the following section.

Although no project is yet proposed for the site, the survey methods used were consistent with the guidelines established by the California Department of Fish and Game for assessing the effects of proposed developments on rare and endangered plants and plant communities. Distributional information for the three species listed as endangered by the federal government -- Sonoma sunshine (*Blennosperma bakeri*), Sebastopol meadowfoam (*Limnanthes vinculans*), and Burke's goldfields (*Lasthenia burkei)* -- was obtained from Appendix B to the Vernal Pool Ecosystem Preservation Plan (CH2M Hill 1996). The previous 1995 and 1997 surveys also provided bases for determining how to allocate the survey effort for the survey reported herein.

Information on distributional and habitat requirements of the target species was obtained from flora (Mason 1975, Munz and Keck 1968, Hickman et al 1993) and the Vernal Pool Ecosystem Preservation Plan.

4.0. SURVEY RESULTS

4.1. VEGETATION TYPE DESCRIPTIONS

The objective of this report is to present the results of a special-status plant species survey. Full habitat descriptions and assessments were, therefore, not made. However, brief descriptions of the habitats are provided in the following sections.

4.1.1. Vernal Pools

Vernal pools are a subclass of seasonal wetlands distinguished from other wetlands in the class on the basis of their configuration (which often implies something about whether their origin is natural or artificial); their microtopography (their depth or the height of the outlet barrier, which determines how deep water can pond); their apparent water relations (whether or not they typically contain standing water and how long water was present, or whether or not the only the soils were saturated during the wet portion of the growing season); and the species richness of the vegetation. The draft Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan (CH2M Hill 1996) prepared for the Vernal Pool Task Force defines vernal pools to be:

> "seasonal wetlands that form in depressions as a result of a shallow, relatively impermeable soil layer that restricts downward movement of water, along with an outlet barrier, causing seasonal ponding. Although the vegetation composition of vernal pools varies as a result of land use practices and annual rainfall and temperature, the vegetation in relatively undisturbed vernal pools is typically characterized by native annual species such as those listed in Table 3-1, many of which are usually found in vernal pool/swale complexes."

Although some of the vernal pools on the Santa Rosa Plain are isolated (many due to the fragmentation to the regional drainage system), many also occur on drainage swales. In either situation, they are characterized by an outlet barrier. In swales, they retain water after runoff from rainfall events and surface runoff has "passed through."

On the Vast Oak East site, vernal pools occur only on the Anderson 48 site. Although the pools were not topographically surveyed, based on hydrologic (algal crusts, deep cattle prints, water-matted mulch, etc.) and vegetative evidence (abundant obligate wetland species typically found in moderately deep pools), they appear capable of ponding water to depths of at least six to eight inches during the winter rainy season. The dominant species in the pools include California semaphore grass (*Pleuropogon californicus*), smooth goldfields (*Lasthenia glaberrima*), popcorn flower (*Plagiobothrys stipitatus* var. *micranthus*), and perennial ryegrass (*Lolium perenne*). Several

of the vernal pool species listed in the Vernal Pool Ecosystem Preservation Plan occur in both the vernal pools and the connecting swales. These species include fringed downingia (*Downingia concolor*), water starwort (*Callitriche marginata*), Lobb's buttercup (*Ranunculus lobbii*), spikerush (*Eleocharis macrostachya*), flowering quillwort (*Lilaea scilloides*), toad rush (*Juncus bufonius*), speedwell (*Veronica peregrina*), American pillwort (*Pilularia americana*), and coyote thistle (*Eryngium aristulatum*).

4.1.2. Seasonal Wetlands

Seasonal wetlands occur at the margin of Hinebaugh Creek, on the lower slopes of the hills in the eastern part of the site, and in the southwestern part of the site. Small seasonal wetlands also occur in and along Hinebaugh and Copeland Creeks. The wetlands along Hinebaugh Creek are subject to flooding when flow exceeds the limited channel capacity. They are generally shallow or lack an outlet barrier and do not pond water for long periods in the manner of vernal pools. Those wetlands in the channel typically occur in sediments where the banks have slumped and remain ponded when other parts of the channel contain only trace amounts of water. The seasonal wetlands on the slope are seep-related wetlands that are not ponded although water that flows toward Hinebaugh Creek is detained in the hoof-prints made by cattle.

Compositionally, the seasonal wetlands are quite varied. The species found most commonly are popcorn flower (*Plagiobothrys stipitatus*), ryegrass (*Lolium perenne*), tidytips (*Layia chrysanthemoides*), curly dock (*Rumex crispus*), and Mediterranean barley (*Hordeum marinum* var. *gussoneanum*). In the wetter areas (ie., in the seasonal wetlands in the creeks), pennyroyal (*Mentha pulegium*), California semaphore grass (*Pleuropogon californicus*), brown-headed rush (*Juncus phaeocephalus*), water starwort (*Callitriche marginata*), Douglas meadowfoam (*Limnanthes douglasii*), and monkey flower (*Mimulus guttatus*) are also present.

4.1.3. Defined Drainages

Hinebaugh Creek is a shallow channel, flowing along a steep gradient between the hills in the eastern part of the site. It increases in depth and width downstream. The creek varies in width from three to five feet and the active channel is typically a foot to 18 inches deep. Where pools occur, the depth may be as much as eight inches greater. No water was present except as traces in the pools at the time of the field survey.

Copeland Creek is a much larger drainage with a much greater contributing watershed. It is approximately 10 to 20 feet wide and the active channel is five to six feet below the top of banks. Much of the channel bottom of Copeland Creek is a cobbly unvegetated substrate.

4.1.4. Annual Grassland

The annual grassland habitat is representative of the type as it occurs in the region. Some fields, i.e., the southwesternmost pasture, had been heavily grazed by the time of the survey and the live vegetation had been reduced to a low stubble of a couple of inches. Others had yet to be grazed.

The annual grassland is dominated by the typical array of annual introduced grasses, including ryegrass, soft chess (*Bromus hordeaceus*), hare barley (*Hordeum murinum* ssp. *leporinum*), ryegrass, oats (*Avena fatua* and *A. barbata*), and ripgut brome (*Bromus rigidus*). Cutleaf geranium (*Geranium dissectum*), filarees (*Erodium* spp.), butter and eggs (*Triphysaria eriantha*), parentucellia (*Parentucellia viscosum*), blue dicks (*Dichelostemma capitatum* ssp. *capitatum*), Ithuriel's spear (*Triteleia laxa*), dog fennel (*Anthemis cotula*), mustards (including *Sisymbrium irio* and *Brassica campestris)*, and wild radish (*Raphanus sativus*) are among the more common forbs in the grassland.

On the shallower soils on the hillsides, several species not found in the finer-textured lowland soils were present. These include larkspur (*Delphinium decorum*), California poppy (*Eschscholzia californica*), catchfly (*Silene gallica*), purple owl's clover (*Orthocarpus purpurascens*), bracken fern (*Pteridium aquilinum*) and poison oak (*Toxicodendron diversiloba*) (both found around rock outcrops), gilia (*Navarretia intertexta*), fiddleneck (*Amsinckia intermedia*), dogtail grass (*Cynosurus echinata*), and soap plant (*Chlorogalum pomeridianum*).

4.1.5. Oak Woodland

The oak woodland occurs on the upper slopes of the hill in the eastern part of the Vast Oak site. The tree species include coast live oak (*Quercus agrifolia*), buckeye (*Aesculus californica*), and Garry oak (*Quercus garryana*). Poison oak and snowberry (*Symphoricarpos* sp.) occur in the understory. The woodland is a relatively open community although it is characterized by an almost closed canopy near the ridge line.

4.2. SPECIAL-STATUS PLANT SPECIES

Although suitable habitat for many of the species is present, none of the species listed in Appendix A were observed on the Vast Oak East site except for Lobb's aquatic buttercup, which was observed in a vernal pool in the southeast corner of the Anderson 48 site by Stromberg in 1995. The findings of the 1995, 1997, and 1998 surveys should satisfy agency requirements and be accepted as a sufficient basis for determining that, except for Lobb's aquatic buttercup (Figure 2), no special-status plant species are present on the Vast Oak East site.

Appendix B lists the species observed in the above habitats during the field survey.

5.0. REFERENCES CITED

CH2M Hill. 1996. Draft Santa Rosa vernal pool ecosystem preservation plan. Submitted to the Santa Rosa Vernal Pool Task Force.

Hickman, J. C. 1993. The Jepson manual, higher plants of California. University of California Press, Berkeley, California. 1400p.

Mason, H. L. 1975. A flora of the marshes of California. University of California Press. Los Angeles.

Munz, P. A. And D. D. Keck. 1968. A California flora. University of California Press. Berkeley.

Skinner, M. W. And B. M. Pavlik. 1994. Inventory of rare and endangered vascular plants of California. California Native Plant Society Special Publication No. 1. Fifth edition.

Stromberg, L. P., Wetlands Consultant. 1995. Results of survey for special-status plant species, Vast Oak West, Sonoma County, California.

Stromberg, L. P., Wetlands Consultant. 1996. Results of survey for special-status plant species, Vast Oak West, Sonoma County, California.

U. S. D. A. Forest Service and Soil Conservation Service and the University of California Agricultural Experiment Station. 1972. Soil survey of Sonoma County. 188p. + maps.

APPENDIX B.
Plant Species Observed During the Spring, 1997 Survey for Special-status Plant Species on the Vast Oak East Site, Sonoma County, California

CLASS **Family** **Scientific Name**	**Common Name**
DICOTYLEDONAE	
Anacardiaceae - Sumac Family	
Toxicodendron diversiloba	Poison oak
Apiaceae - Parsley Family	
Daucus carota	Queen Anne's lace
Sanicula arctopoides	Footsteps of spring
Sanicula bipinnatifida	Purple sanicle
Asteraceae - Sunflower Family	
Achillea millefolium	Yarrow
Achyrachaena mollis	Blow-wives
Agoseris sp.	Cat's ear
Carduus pycnocephala	Italian thistle
Centaurea solstitialis	Yellow starthistle
Chamomilla suaveolens	Pineapple weed
Filago sp.	Herba impia
Hyperevax caulescens	Evax
Hypocheris glabra	Cat's ear
Lasthenia californica	Goldfields
Lactuca serriola	Wild lettuce
Picris echioides	Bristly ox-tongue
Psilocarphus brevissimus	Wooly marbles
Boraginaceae - Borage Family	
Amsinckia intermedia	Fiddleneck
Plagiobothrys nothofulvus	Popcorn flower
Plagiobothrys stipitatus spp. *micranthus*	Popcorn flower
Brassicaceae - Mustard Family	
Brassica campestris	Field mustard
Brassica geniculata	Short-pod mustard
Capsella bursa-pastoris	Shepard's purse
Lepidium nitidum var. *nitidum*	Peppergrass

APPENDIX B (Cont'd.)

**Plant Species Observed During the 1997 Survey for
Special-status Plant Species on the
Vast Oak East Site, Sonoma County, California**

CLASS **Family** **Scientific Name**	**Common Name**
Raphanus sativus	Wild radish
Sisymbrium irio	London rocket
Callitricaceae - Water starwort Family	
Callitriche marginata	Winged water starwort
Campanulaceae - Bellflower Family	
Downingia concolor	Fringed downingia
Caryophyllaceae - Pink Family	
Cerastium viscosum	Mouse-ear chickweed
Silene gallica	Catchhfly (windmill pink)
Spergularia sp.	Sand spurrey
Stellaria media	Common chickweed
Convolvulaceae - Morning-glory Family	
Convolvulus arvensis	Field bindweed
Crassulaceae - Stonecrop Family	
Crassula erecta	Sand pygmy weed
Fabaceae - Pea Family	
Acacia melanoxylon	Blackwood acacia
Lotus humistratus	Bird's-foot trefoil
Lupinus bicolor	Miniature lupine
Lupinus nanus	Lupine
Medicago polymorpha	Bur-clover
Trifolium barbigerum var. *andrewsii*	Gray's clover
Trifolium depauperatum var. *depauperatum*	Dwarf sack clover
Trifolium hybridum	Alsike clover
Trifolium pratense	Red clover
Trifolium repens	Clover
Trifolium subterraneum	Subterranean clover
Trifolium variegatum	Clover
Trifolium wormskoldii	Dwarf sack clover

Special-status Plant Species on the
Vast Oak East Site, Sonoma County, California

CLASS **Family** **Scientific Name**	**Common Name**
Vicia sativa	Vetch
Fagaceae - Oak Family	
Quercus agriofolia	Coast live oak
Quercus garryana	Garry oak
Geraniaceae - Geranium Family	
Erodium botrys	Filaree
Erodium cicutarium	Red-stemmed Filaree
Erodium moschatum	White-stem Filaree
Geranium dissectum	Cutleaf geranium
Hippocastanaceae - Buckeye Family	
Aesculus californica	Buckeye
Labiatae - Mint Family	
Mentha pulegium	Pennyroyal
Limnanthaceae - Meadowfoam Family	
Limnanthes douglasii	Douglas' meadowfoam
Lythraceae - Loosestrife Family	
Lythrum hyssopifolium	Purple loosestrife
Papaveraceae - Poppy Family	
Eschscholzia californica	California poppy
Plantaginaceae - Plantain Family	
Plantago lanceolata	English plantain
Plantago major	Common plantain
Polygonaceae - Buckwheat Family	
Polygonum arenastrum	Knotweed
Rumex acetosella	Sheep sorrel
Rumex crispus	Curly dock
Rumex pulcher	Dock
Portulaceae - Purslane Family	
Calandrinia ciliata	Red maids
Montia perfoliata	Miner's lettuce

APPENDIX B (Cont'd.)
Plant Species Observed During the 1997 Survey for
Special-status Plant Species on the

Vast Oak East Site, Sonoma County, California

CLASS **Family** **Scientific Name**	**Common Name**
Primulaceae - Primrose Family	
Anagallis arvensis	Scarlet pimpernel
Ranunculaceae - Buttercup Family	
Delphinium decorum	Larkspur
Ranunculus californicus	California buttercup
Ranunculus lobbii	Lobb's aquatic buttercup
Ranunculus orthorynchus	Straight-beaked buttercup
Schrophulariaceae - Figwort Family	
Mimulus guttatus	Monkeyflower
Orthocarpus purpuascens	Purple owl's clover
Parentucellia viscosum	Parentucellia
Triphysaria eriantha	Butter and eggs
MONOCOTYLEDONAE	
Cyperaceae - Sedge Family	
Cyperus eragrostis	Umbrella sedge
Eleocharis acicularis	Miniature spikerush
Eleocharis macrostachya	Spikerush
Iridaceae - Iris Family	
Sisyrinchium bellum	Blue-eyed grass
Juncaceae - Rush Family	
Juncus balticus	Twisted rush
Juncus bufonius	Toad rush
Juncus capitatus	Capitate rush
Juncus effusus	Ruch
Juncus phaeocephalus	Brown-headed rush
Liliaceae - Lily Family	
Brodiaea terrestris	Dwarf brodiaea
Chlorogalum pomeridianum	Soap plant

APPENDIX B (Cont'd.)
Plant Species Observed During the 1997 Survey for
Special-status Plant Species on the
Vast Oak East Site, Sonoma County, California

CLASS **Family** **Scientific Name**	**Common Name**
Dichelostemma capitatum ssp. *capitatum*	Blue dicks
Triteleia laxa	Ithuriel's spear
Poaceae - Grass Family	
Aira caryophyllea	Silver hairgrass
Avena barbata	Slender wild oat
Avena fatua	Wild oat
Briza minor	Little rattlesnake grass
Bromus diandrus	Ripgut brome
Bromus hordeaceus	Soft chess
Bromus madritensis ssp. *rubens*	Red brome
Cynosurus echinatus	Dogtail grass
Danthonia californica	Oatgrass
Glyceria occidentalis	Manna grass
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley
Hordeum murinum ssp. *leporinum*	Hare barley
Lolium perenne	Perennial ryegrass
Poa annua	Annual bluegrass
Polypogon monspeliensis	Rabbitfoot grass
Nassella pulchra	Needlegrass
Vulpia bromoides	Six-weeks fescue
Vulpia myuros	Rat-tail fescue
Vulpia octoflora	Fescue

Source: Vast Oak 1026 Determination Request, Quaker Hill Development Corporation.

Base: 1:6000-scale aerial photograph taken March 6, 1995, by Aero Cartographics, Santa Rosa.

Anderson 48 Site

Petaluma Hills Road

HABITAT ASSESSMENT AND FIELD STUDIES FOR SPECIAL-STATUS WILDLIFE, VAST OAK PROJECT SITE, SONOMA COUNTY, CALIFORNIA, **SUBMITTED TO MR. CRAIG HARRINGTON, QUAKER HILL DEVELOPMENT CORPORATION, HEALDSBURG, CA, PREPARED BY BIOSEARCH WILDLIFE SURVEYS DATED NOVEMBER 29, 2000.**

HABITAT ASSESSMENT AND FIELD STUDIES FOR SPECIAL-STATUS WILDLIFE, VAST OAK PROJECT SITE, SONOMA COUNTY, CALIFORNIA

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November 29, 2000

HABITAT ASSESSMENT AND FIELD STUDIES FOR SPECIAL-STATUS WILDLIFE, VAST OAK PROJECT SITE, SONOMA COUNTY, CALIFORNIA

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HABITAT ASSESSMENT AND FIELD STUDIES FOR SPECIAL-STATUS WILDLIFE, VAST OAK PROJECT SITE, SONOMA COUNTY, CALIFORNIA

SUMMARY

An assessment of wildlife habitats for special-status vertebrates was conducted at the Vast Oak project site located near Rohnert Park in Sonoma County, California. In addition, focused surveys were performed for special-status amphibians, reptiles and nesting birds. The results of previous field studies for special-status wildlife performed onsite from 1994-1996 are also summarized. The study area covers approximately 540 acres of mostly flat to moderately-steep terrain located at the eastern edge of Rohnert Park.

The site consists of two parcels, one east and one west of Petaluma Hill Road. West of Petaluma Hill Road, the bulk of the property is currently in agricultural production. Copeland Creek borders the parcel on the south and supports riparian habitat. Hinebaugh Creek crosses the northern part of the parcel and supports a band of willows. The portion of the property east of Petaluma Hill Road is largely annual grassland that is currently used to graze sheep and cattle. A portion of this parcel is used to grow row crops. A prominent ridge in the eastern part of the site supports oak woodland and savannah.

Several special-status vertebrate species occur or historically occurred in the region and were determined to have the potential to inhabit the project site. The California Department of Fish and Game (CDFG) reported observations of steelhead in Copeland Creek (ESA 2000), and this species is currently the only vertebrate listed as threatened or endangered by state or federal governments that is known to inhabit the project site. The project site is outside the range of the federally threatened California red-legged frog as delineated by the U. S. Fish and Wildlife Service (Miller, *et al.* 1996), and none have been detected during four years of focused surveys.

Five other special-status species were observed onsite. The white-tailed kite, a CDFG fully protected species, was observed foraging and roosting both east and west of Petaluma Hill Road. Potential nesting habitat for this species is present along Copeland Creek and in the oaks onsite, although it did not nest onsite in 1994 or 2000. The grasshopper sparrow, listed as a U.S. Fish and Wildlife Service (USFWS) Migratory Nongame Bird of Management Concern, was observed during the nesting season in 2000 in the grasslands east of Petaluma Hill Road and in fallow fields west of Petaluma Hill Road. The foothill yellow-legged and western pond turtle, CDFG protected species and species of special concern, and the yellow warbler, a CDFG species of special concern and USFWS Migratory Nongame Bird of Management Concern, were observed along Copeland Creek.

Suitable habitat is present, and recent records exist in the region, for other special-status wildlife, including Cooper's hawk, loggerhead shrike, California horned lark, pallid bat and Townsend's big-eared bat. The rest of the species under consideration have a low likelihood of inhabiting the study site due to the lack of breeding, nesting or wintering habitat, the lack of recent records from the region, and/or the lack of observations during focused surveys.

1.0 INTRODUCTION

The Vast Oak site consists of two separate parcels east of Rohnert Park in Sonoma County, California. At the request of Quaker Hill Development Corporation, Biosearch Wildlife Surveys conducted focused surveys for special-status amphibians and reptiles in 1994, 1995 and 1996 and focused surveys for nesting special-status birds in 1994 (Biosearch Wildlife Surveys 1996; 1997). Focused surveys for special-status amphibians and reptiles, and nesting special-status birds were repeated on the site in 2000. This document summarizes the results of all surveys between 1994 and 2000, and provides an assessment of habitat suitability for all special-status wildlife known from the region. The site has been surveyed previously for special-status plants (Stromberg 1995, 1996, 1997, 1998, 1999) and special-status insects (Arnold 1994). A wetland delineation has also been prepared (Stromberg 2000).

2.0 METHODS

2000 Surveys. All field work in 2000 was performed by wildlife biologists Mark Allaback, David Laabs, Caleb Murphy and Paul Heady III. The project area was surveyed on foot and wildlife habitats were identified. Unique habitat features and potentially suitable habitat for special-status wildlife species were noted and mapped. All wildlife species observed or detected by sign were recorded (Appendix 1).

A record search of the California Natural Diversity Data Base (CNDDB) for the Cotati USGS 7.5' series quadrangle was conducted. Range maps, locality records and habitat associations were reviewed for all special-status wildlife species to assess their likelihood to inhabit the study site. The potential for special-status species to inhabit the study area was assessed based on the presence of necessary habitat characteristics and confirmed records from the region.

Focused surveys for riparian-nesting birds including yellow-billed cuckoo, yellow warbler, and yellow-breasted chat were performed along Copeland and Hinebaugh Creeks on 26 April, 24 May and 14 June 2000. A single transect was walked between the hours of 0530 and 0900 along the entire length of each drainage where they pass through the study area. All birds heard or seen were identified and counted. Surveys for tree-nesting raptors including Cooper's hawk, golden eagle and white-tailed kite were conducted on 30 June 2000. Point counts were made from prominent vantages to search for raptors. Trees were systematically searched for stick nests. Surveys for ground- and shrub-nesting birds including northern harrier, California horned lark, loggerhead shrike, grasshopper sparrow and burrowing owl were conducted on 30 June 2000. Transects were walked through the grasslands and oak woodland east of Petaluma Hill Road to search for nesting birds.

Two daytime surveys for special-status amphibians and aquatic reptiles including northern red-legged frog, foothill yellow-legged frog and western pond turtle were performed along Copeland and Hinebaugh Creeks on 24 May and 26 June 2000. Surveys were conducted by slowly walking in or along each stream, pausing to scan open water areas, the stream channel and adjacent upland areas with binoculars. All frogs and turtles were identified to species, if possible. Nocturnal surveys were conducted on 24 May and 26 June 2000 using headlamps (6-volt, rechargeable) and binoculars. Visibility was greatly restricted along Hinebaugh Creek due to dense willow vegetation. Aquatic sampling for special-status amphibians was performed with long-handled, D-shaped dip-nets along Copeland and Hinebaugh Creeks, and in a swale to the south of the hill east of Petaluma Hill Road on 26 April and 30 June 2000. All amphibians were identified to species and released.

A habitat assessment and limited survey were performed for special-status bats in the day and evening of 16 June 2000. The buildings and oak woodland east of Petaluma Hill Road were inspected during the day using bright lights to search for bats and evidence of bat use. A mist net was set over the unnamed drainage at the base of the hill in the southeast portion of the site and monitored from 2015-2345. During the same time, acoustic monitoring was conducted at the edge of the oak woodland on the hill in the southeast portion of the site using a bat detector, zero crossing analyzer and laptop computer (Anabat system).

1994-1996 Surveys. Field surveys from 1994-1996 were performed by wildlife biologists Mark Allaback and David Laabs. On 21 March and 3 May 1994, daytime searches and aquatic sampling was performed throughout all water bodies onsite following methods described above. The survey effort concentrated on Copeland and Hinebaugh Creeks and at an irrigation pond south of Hinebaugh Creek.

Riparian bird surveys were performed along Copeland and Hinebaugh creeks on 3 May and 9 June 1994. A series of points were established along the length of each creek within the project site. At each point, an observer spent ten minutes and recorded all bird species seen or heard. Surveys for nesting raptors were also performed throughout the site on 3 May and 9 June 1994.

Diurnal surveys and aquatic sampling were performed each visit along the Copeland and Hinebaugh drainage basins and in all standing water onsite following methods described above on 6 April, 8 June and 9 June 1995. A nocturnal survey was conducted on 8 June 1995 along Copeland and Hinebaugh Creeks following methods described above.

Daytime and nighttime surveys were conducted for amphibians and reptiles on 18 June and 30 July 1996 along Hinebaugh and Copeland Creeks and at an irrigation pond south of Hinebaugh Creek following the methods described above. Aquatic sampling was performed along both drainage courses using long-handled, D-shaped dip-nets or a seine (4' x 10' with 1/8" mesh). A summary of survey dates is provided below (Table 1).

	Survey Methods		
Date	**Diurnal**	**Nocturnal**	**Aquatic**
3/21/94	X		X
5/3/94	X		X
4/6/95	X		X
6/8/95	X	X	X
6/18/96	X	X	X
7/30/96	X	X	
4/26/00	X		X
5/24/00	X	X	
6/26/00	X	X	
6/30/00	X		X

Table 1. Summary of survey techniques for amphibians and aquatic reptiles employed at Vast Oak Project site, 1994-2000. Survey area includes Copeland Creek, Hinebaugh Creek, and onsite tributaries.

For purposes of this document, special-status wildlife species include the following: those listed by the USFWS as Threatened or Endangered; species for which the USFWS has sufficient information to list as Endangered or Threatened, but for which listing is precluded (Candidate Species, formerly Category 1 Species); species listed by the California Fish and Game Commission as Threatened or Endangered and those species that are Candidates for listing as Threatened or Endangered; species for which a proposed rule to list as Endangered or Threatened has been published by USFWS (Proposed species); species listed by the USFWS as Migratory Nongame Birds of Management Concern; species listed by the Department of Fish and Game as Species of Special Concern; species protected under the Fish & Game Code of California as "fully protected birds", "fully protected mammals, "fully protected reptiles and amphibians" and "fully protected fish"; species listed as Protected Amphibians, Protected Reptiles and Protected Furbearers in the California Code of Regulations; and birds of prey protected by Section 3503.5 of the Fish and Game Code.

3.0 SETTING

The Vast Oak property encompasses approximately 540 acres located east of the city of Rohnert Park in Sonoma County, California (Figure 1). Petaluma Hill Road bisects the site in a north-south direction, while Rohnert Park Expressway crosses a portion of the site from east to west.

West of Petaluma Hill Road, the site is bordered by Sonoma State University on the south, Keiser Avenue on the north and apartment complexes to the west. Topography is flat and elevations range from 120 to 160 feet. With the exception of the riparian corridors, nearly the entire site west of Petaluma Hill Road is regularly disked on a rotating basis for agricultural purposes. Several large oaks have been left standing in the field north of Hinebaugh Creek. Hinebaugh Creek crosses the northern portion of the site and supports patchy willow riparian habitat. Much of this willow scrub is dense and nearly impenetrable. Scattered pools up to 3-4 feet deep are present in the openings between the willows. Copeland Creek passes along the southern edge of the site and supports riparian habitat. The understory is dense and consists largely of invasive species including Himalayan blackberry and periwinkle. Portions of the under-story of the creek have been cleared in the past for flood control purposes. Crane Creek is just offsite to the north.

The parcel east of Petaluma Hill Road is irregular in shape and is marked by existing fencelines. Elevations range from 160 feet to 441 feet. The primary wildlife habitat is non-native annual grassland that is currently used for grazing cattle and sheep. The far northern part of the site is used to grow row crops. A hill rises steeply in the southern portion and supports oak woodland and oak savannah. Copeland Creek, where it forms a portion of the southern edge of the site, is degraded and contains no riparian vegetation. A line of eucalyptus trees is present along this portion of Copeland Creek. Hinebaugh Creek passes through the northern section of the parcel. A small patch of willows and scattered deep pools are present in this part of the creek. The uppermost portion of Hinebaugh Creek in the eastern part of the site dries early in the season. A seasonal swale that contains several small pools flows around the south side of the hill and drains into Hinebaugh Creek. Residences and associated structures are located on the northernwestern side of the hill. Several non-native trees are present in this area. The parcel abuts Crane Creek Regional Park on the east, and open space is currently present to the north and south as well.

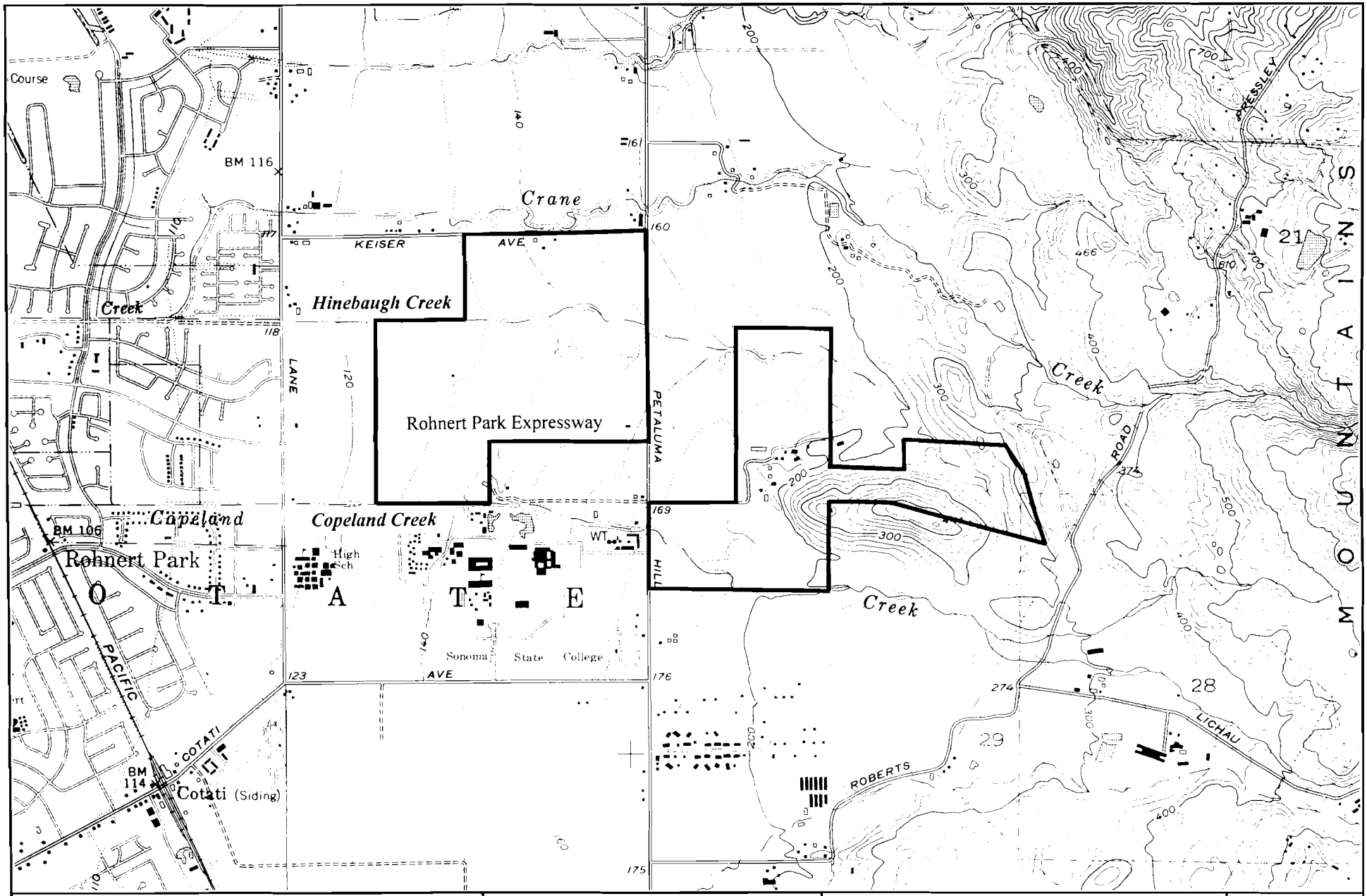

Figure 1. Vast Oak Project Site, Sonoma County, CA

Biosearch Wildlife Surveys
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Santa Cruz, CA 95060

Scale in Miles
0 ½ 1

Source: Cotati USGS 7.5' Series Quad

N

4.0 RESULTS

An analysis of special-status vertebrates that inhabit or have the potential to inhabit the project site is provided below. A summary of special-status wildlife species, their legal status, habitat affinities and potential to inhabit the project site is presented in Table 2. Background information is provided for each target species, followed by an assessment of available habitat, any known recent or historic records and the results of focused surveys, if performed.

4.1 Special-status Fish Species

Central California Coast Steelhead (*Oncorhychus mykiss*). The National Marine Fisheries Service has listed steelhead stocks within the Central California Coast Evolutionarily Significant Unit (ESU) as threatened. This ESU extends from the Russian River south to Soquel Creek and includes all steelhead stocks in coastal streams and streams tributary to San Francisco Bay (Fed. Reg. Vol. 62, No. 159, Pgs. 43937-43954, Aug. 18, 1997). Recent information to quantify steelhead populations in the Russian River is limited, but there is general agreement that the population has declined in the last 30 years (CDFG 1984, 1991, Steiner 1996).

Steelhead occupy all of the major tributaries and most of the smaller ones in the Russian River Watershed. Many of the minor tributaries may provide spawning or rearing habitat under specific hydrologic conditions. There is a possibility that some spawning and rearing may occur in the mainstem of the Russian River, but the majority of spawning and rearing habitat for steelhead occurs in the tributaries.

Life History. Adult steelhead generally begin returning to the Russian River in November or December, coincident with the first heavy rains of the season, and continue to migrate upstream into March or April. The peak migration period tends to be January through March (EIP Assoc. 1993, SCWA 1996, SWRCB 1997). Flow conditions are suitable for upstream migration in most of the Russian River and larger tributaries during the majority of the spawning period in most years. The sandbar may block the river mouth in some years and delay entry into the river. When the sand bar is closed, flow in the river probably is too low and water temperature too high to provide suitable conditions for migrating adults further up the river (CDFG 1991).

Most spawning takes place from January through April, depending on the time of freshwater entry. Steelhead spawn and rear in tributaries from Jenner Creek near the mouth, to tributaries north of Forsythe Creek in the upper basin. Steelhead usually spawn in the tributaries, where fish ascend as high as flows allow (USACE 1982).

After hatching, steelhead spend from one to four years in freshwater. Fry and juvenile steelhead are extremely adaptable in their habitat selection. Requirements for steelhead rearing include adequate cover, food supply, and water temperatures. The upper reaches of the tributaries provide the most suitable habitat, as these areas generally have excellent cover, adequate food supply, and suitable water temperatures for fry and juvenile rearing. The lower sections of the tributaries provide less cover, as the streams are often wide and shallow and have little riparian vegetation, and water temperatures are often too warm to support steelhead. In the summer, these areas can dry up completely. Available cover has been reduced in many tributaries because of loss of riparian vegetation and changes in stream morphology.

Emigration usually occurs between February and June, depending on flow and water temperatures. Sufficient flow is required to initiate the downstream migration of smolts. Excessively high water temperatures in late spring may inhibit smoltification in late migrants.

Copeland Creek. Copeland Creek is a historic steelhead stream. CDFG has reported steelhead from Copeland Creek upstream of the project site (ESA 2000). A reconnaissance survey of the project area was conducted on September 5, 2000, during low flow conditions, and revealed that the creek was essentially dry from downstream of Roberts Road to Sonoma State University (a distance of approximately 8,000 feet). There was flowing water at and upstream of Roberts Road. A reach of about 800 feet also had flowing water adjacent to Sonoma State University. Water flowed from a culvert on the south bank into the stream channel and maintained limited surface flow before seeping into the streambed. Fish observed were juvenile Sacramento sucker (*Catostomus occidentalis*), juvenile California roach (*Lavinia symmetricus*) and mosquito fish (*Gambusia affinis*). The entire reach of channel appears to provide suitable substrate for steelhead spawning and might support some juvenile steelhead rearing, but only on a seasonal basis because of the limited flow regime.

Copeland Creek likely provides some steelhead rearing in its upstream reaches above the project area. Therefore, the reach from Roberts Road downstream through the project area functions as a migration route to and from the spawning and rearing areas upstream.

Hinebaugh Creek. Hinebaugh Creek does not contain steelhead habitat. Substrate is predominantly clay, or angular rocks on top of clay and the flow regime is even more limited than Copeland Creek. There is no permanent water in the upper reaches. There was no surface water in Hinebaugh Creek from the project area upstream to the headwaters. Therefore, there are no spawning and rearing opportunities for steelhead in this portion of the watershed.

Other Special Status Fish Species. There is no habitat in either Copeland or Hinebaugh Creek systems capable of supporting coho or Chinook salmon.

4.2 Special-status Amphibian Species

The project site is within the range of three special-status amphibian species: California tiger salamander, northern red-legged frog and foothill yellow-legged frog. Based on the range provided by the USFWS (Miller, *et al.* 1996), the project site is situated outside the range of the federally threatened California red-legged frog.

California Tiger Salamander (*Ambystoma californiense*). The California tiger salamander inhabits grassland and oak savanna habitats in the valleys and low hills of central and coastal California. Habitat conversion has eliminated the species from much of its former range (Shaffer 1993; Fisher and Shaffer 1996). Adults spend most of their lives underground, typically in burrows of ground squirrels and other animals (Jennings and Hayes 1994). During winter rains between November and March, adults emerge from underground retreats to feed, court and breed (Loredo and Van Vuren 1996). Vernal pool and semi-permanent, quiet waters provide sites for egg-laying. After hatching in two to three weeks, larvae are 10-15 mm in length. They continue to develop in the pools for three to four months until they metamorphose at about 100-125mm (50-70mm snout-vent length). Annual recruitment is variable and appears to be related to the timing and amount of rainfall (Loredo and Van Vuren 1996). Following transformation, juvenile salamanders seek refugia, typically mammal burrows, in which they may remain until the next winter rains (Stebbins 1985; Jennings 1996). However, movements of juveniles are unpredictable and mass movements have been observed in the summer months and during the first fall

rains (Holland, *et al.* 1990). The California tiger salamander is currently listed as a federal Candidate species following a ruling by the USFWS (Sorensen 1994), which found Endangered status "warranted but precluded" by higher priority species. In January 2000, the sub-species in Santa Barbara County was emergency listed as endangered by the federal government.

The site is within the range of the California tiger salamander and the species has been recorded from the region. Suitable upland habitat is present in the grasslands of the eastern part of the site. However, potential breeding habitat on the site is very limited and is restricted to pools within small tributaries to Hinebaugh and Copeland Creek. There was little standing water in these pools in the spring during 1994-1996 or in 2000, and the pools were not deep enough to provide optimal habitat for larvae, which require at least 2.5 to 3 months to metamorphose. Copeland Creek does not provide suitable breeding habitat for the species due to high flows in the winter. Hinebaugh Creek provides marginal breeding habitat, although conditions are compromised by the presence of crayfish and bullfrogs and flow during the winter. Moreover, the uplands adjacent to Hinebaugh Creek have been converted to agricultural use.

All potential breeding habitat onsite for the California tiger salamander was sampled during the spring and/or summer on two occasions in 1994, 1995 and 2000, and once during 1996. No salamander larvae were detected on any of these occasions. The closest confirmed observations of California tiger salamander are from 3.4 miles WNW of the site and from 3.8 miles WSW of the site (CNDDB), west of Highway 101. No observations of California tiger salamander have been reported east of Highway 101 in this area. No California tiger salamanders were detected during aquatic sampling performed onsite for special-status invertebrates (Arnold 1994).

California Red-legged Frog (*Rana aurora draytonii*). There are two subspecies of red-legged frog, and the project site is in an area considered to be an intergrade zone between them (Jennings and Hayes 1994; Miller, *et al.* 1996). The California subspecies (*R. a. draytonii*) is listed as threatened by the USFWS, while the northern subspecies (*R. a. aurora*) is listed as a species of special concern by CDFG. In Sonoma and Marin Counties, USFWS considers the range of the California red-legged frog to include those drainage basins that flow into the Napa River, Sonoma Creek and Petaluma River, and those drainages south of and including the Walker Creek watershed (Miller, *et. al.* 1996). Since the project site is in the Russian River watershed, the site is outside of the range of the California red-legged frog as described by USFWS (Miller, et al. 1996).

The California red-legged frog is a large (85-138 mm), nocturnal species that historically occupied many of the Pacific drainage basins in California. The species requires still or slow-moving water during the breeding season, where it deposits large egg masses, usually attached to submerged or emergent vegetation. Breeding typically occurs between December and April, depending on annual environmental conditions and locality. Eggs require 6 to 12 days before hatching and metamorphosis occurs 4 to 7 months after hatching. Following the breeding season, adult California red-legged frogs may remain at breeding ponds, or they may make use of streams or other water sources. Although red-legged frogs remain close (<100 meters) to aquatic habitats during the summer, they make extensive use of upland habitats during the fall and winter. Movements of individuals generally begin with the first rains of the weather-year or in response to receding water (Bulger 1999). Movements of more than two miles between breeding and non-breeding habitat have been documented using radio telemetry, with individuals travelling in straight-line movements irrespective of habitat (Bulger 1999). Adults seem to prefer riparian vegetation, overhanging banks or plunge pools for cover, especially during the breeding season. They may take refuge in small mammal burrows, leaf litter or other moist areas during periods of inactivity or whenever it is necessary to avoid desiccation (Rathbun, *et al.* 1993; Jennings and Hayes 1994; Allaback and Laabs, pers. observ.). Occurrence of this frog has shown to be negatively correlated with presence of introduced bullfrogs (Moyle 1973; Hayes & Jennings 1986,

1988). The California red-legged frog has been largely extirpated from the Central Valley, the west slope of the Sierras and the Transverse Ranges. On 23 May 1996, the California red-legged frog was listed as Threatened by the federal government (USFWS 1973; Miller, *et al.* 1996). The subspecies is also listed by CDFG as a species of special concern.

In 1997, California red-legged frogs were observed at a pond at the Sonoma County Central Landfill southwest of Cotati, located approximately 5 miles southwest of the project site (CNDDB). This locality is in a drainage basin that flows into Petaluma River, and is therefore within the range *R. a. draytonii.* In 2000, critical habitat for the California red-legged frog was proposed by USFWS. The project site is not included in this critical habitat.

Focused surveys for red-legged frogs were conducted between 1994 and 2000. No red-legged frog larvae were detected during aquatic surveys of available breeding habitat in 1994, 1995, 1996 or 2000. No red-legged frog adults were observed during nocturnal visual surveys performed in 1995, 1996, or 2000.

Northern Red-Legged Frog (*Rana aurora aurora*). There are two subspecies of red-legged frog, and the project site is in an area considered to be an intergrade zone between them (Jennings and Hayes 1994; Miller, *et al.* 1996). The northern subspecies (*R. a. aurora*) is listed as a species of special concern by CDFG, while the California subspecies (*R. a. draytonii*) is listed as threatened by the USFWS. In Sonoma and Marin Counties, USFWS considers the range of the California red-legged frog to include those drainage basins that flow into the Napa River, Sonoma Creek and Petaluma River watersheds, and those drainages south of and including the Walker Creek watershed (Miller, *et. al.* 1996). Since the project site is in the Russian River watershed, the site is outside of the range of the California red-legged frog as described by USFWS (Miller, et al. 1996).

The northern red-legged frog differs from the California subspecies in a number of physical, biochemical and behavioral characters. The northern subspecies is smaller, vocalizes from beneath the water surface rather than in the air, and lays its eggs submerged rather than in contact with the water surface (Hayes and Miyamoto 1984). The two forms also demonstrate wide genetic differentiation. The taxonomic relationships between the two subspecies remain unresolved, as does the genetic identity of individuals from within the contact zone.

In 1989, six years before the USFWS defined the current range of the California red-legged frog, a single red-legged frog was collected by Dr. Mark Jennings approximately four miles east of the project site along Copeland Creek (Vindum, pers. comm.). However, the genetic affiliation of this specimen in unknown. Since that time, there have been no red-legged frogs reported from the vicinity of the Vast Oak site, and the 1989 specimen represents the closest known observation.

Focused surveys for red-legged frogs were conducted between 1994 and 2000. No northern red-legged frog larvae were detected during aquatic surveys of available breeding habitat in 1994, 1995, 1996 or 2000. No northern red-legged frog adults were observed during nocturnal visual surveys performed in 1995, 1996, or 2000. Bullfrogs were observed onsite in both drainage basins. Marginal breeding habitat is present for the northern red-legged frog along Hinebaugh Creek, although the presence of crayfish and bullfrogs reduces habitat quality. Appropriate habitat for foraging and shelter is present along Copeland Creek, although high flows during the winter and spring would eliminate breeding in the creek during most years.

Foothill yellow-legged frog (*Rana boylii*). The foothill yellow-legged frog is a moderate-sized (37-82 mm) frog that inhabits the Coast Range from the Oregon border to San Luis Obispo County and the western foothills of the Sierra Nevada in California. It lays egg masses during spring in small- to

medium-sized streams and rivers with cobble-sized or greater substrate, a significant amount of riffle habitat and partial shade (Hayes & Jennings 1988; Kupferberg 1996). Females lay single clutches of greater than 1000 eggs usually in the same general locations each year, often at a stream confluence in microhabitats where boulders create below average flow (Kupferberg 1996). Tadpoles are cryptically colored and difficult to observe in a flowing stream environment. Metamorphosis occurs between July and September. At some locations near breeding sites, metamorphs can be observed relatively easily in late summer and early fall along stream banks (pers. observ.). Bullfrogs and predatory, introduced fishes negatively affect tadpoles (Hayes & Jennings 1988; Kupferberg 1996). The foothill yellow-legged frog has been extirpated from most historic locations in southern California and throughout much of the foothills in the Sierra Nevada (Jennings and Hayes 1994). The California Department of Fish and Game lists the foothill yellow-legged frog as a Species of Special Concern.

The foothill yellow-legged frog is relatively common in the region, particularly in the foothills surrounding the Santa Rosa Plain (Northen, pers. comm.). The species has been reported from Copeland Creek upstream of the project site at the Lichau Bridge crossing (CNDDB). The species was reported from Copeland Creek in the eastern part of the site in 1999 (Sonoma County Water Agency 1999). In both 1995 and 1996, foothill yellow-legged frog tadpoles were detected along Copeland Creek in the eastern part of the site. In 1996, an adult foothill yellow-legged frog was observed at night in Copeland Creek under the Petaluma Hill Road bridge crossing. The larvae were positively identified based on numbers of toothrows. On 5 September 2000, a yellow-legged frog metamorph was observed along Copeland Creek near the southwest edge of the site.

4.3 Special-status Reptile Species

The project site is within the range of a single special-status reptile species: the western pond turtle. The western pond turtle is listed as a state Species of Special Concern.

Western pond turtle (*Clemmys marmorata*). The western pond turtle originally inhabited many of the pacific drainage basins in California. It ranges from western Washington to northern Baja California, mostly west of the Sierra Nevada-Cascade crest (Stebbins 1985). It ranges in size to just over 8 inches (21cm) with a low carapace that is generally olive, brownish or blackish (Stebbins 1985, Jennings and Hayes 1994). It primarily inhabits permanent water sources including ponds, streams and rivers. Although it is primarily an aquatic species, it can move across land in response to fluctuating water level, an apparent adaptation to the variable rainfall and unpredictable flows that occur in many coastal California drainage basins (Rathbun, *et al.* 1992). In addition, it can over-winter on land or in water or remain active in the winter, depending on environmental conditions (Rathbun, *et al.* 1993; Jennings and Hayes 1994). Females travel from aquatic sites to lay eggs in a shallow nest, especially in open, grassy areas with a southerly exposure (Holland 1992; Rathbun, *et al.* 1992). Nests have been reported from 2-400 meters or more away from water bodies (Jenning and Hayes 1994). It appears that most hatchlings over-winter in the nest (Holland 1992; Jennings and Hayes 1994), and placing nests away from watercourses makes young less susceptible to death by flood events that commonly occur during the winter weather year (Rathbun, *et al.* 1992). Pond turtles may live for 40 years or more (Jennings and Hayes 1994), and are therefore sometimes found in degraded areas. Adults appear to be able to persist for several years in poor aquatic habitat without any successful recruitment, presumably due to introduced predators or unsuitable conditions for egg deposition. The western pond turtle has been separated into two subspecies (*C. m. marmorata* is the northwestern subspecies and *C. m. pallida* is the southwestern subspecies), both of which are listed as Species of Special Concern by the CDFG. Current research suggests, however, that the taxon may be represented by three distinct populations throughout

its range in California and may therefore require a taxonomic revision (Jennings and Hayes 1994). The entire species is listed a protected species and a species of special concern by the state of California.

On 30 June 2000, a western pond turtle (90mm carapace length) was observed along Copeland Creek in the southern edge of the western portion of the project site. In 1996, 8 western pond turtles and 2 red-eared sliders (*Pseudemys scripta*) were observed offsite in the artificial lake on the campus of Sonoma State University immediately south of the project site. Although much of the nearby upland habitat onsite is regularly disked, it is possible that turtles could dig nests onsite, especially along the edge of the fields near the riparian zone. The portion of Copeland creek on the eastern portion of the site provides only marginal habitat for the species, due to its ephemeral nature and lack of vegetation. Potential habitat is present onsite for western pond turtles in Hinebaugh Creek on both portions of the site. Vegetative cover and deep pools are available in portions of the creek, and the species is from downstream where Hinebaugh Creek meets Laguna de Santa Rosa (CNDDB). The presence of bullfrogs and the proximity of agriculture has degraded Hinebaugh Creek along much of its length.

4.4 Special-status Bird Species

The project site is within breeding range of several special-status bird species. After a review of locality records and analysis of the habitats available on the project site, it was determined that the site does not provide nesting habitat for double-crested cormorant (*Phalacrocorax auritus*), American bittern (*Botaurus lentiginosus*), white-faced ibis (*Plegadis chihi*), Barrow's goldeneye (*Bucephala islandica*), sharp-shinned hawk (*Accipiter striatus*), bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), peregrine falcon (*Falco peregrinus*), prairie falcon (*Falco mexicanus*), short-eared owl (*Asio flammeus*), northern spotted owl (*Strix occidentalis*), Vaux's swift (*Chaetura vauxi*), olive-sided flycatcher (*Contopus borealis*) or Bell's sage sparrow (*Amphispiza belli belli*). Some of these species may be seen incidentally, especially during migration or during the winter months. The site is outside the wintering range of the Aleutian Canada Goose (*Branta canadensis leucopareia*).

Cooper's hawk (*Accipiter cooperi*). The Cooper's hawk is a small raptor that breeds in oak woodlands, coniferous forests and deciduous riparian areas. It breeds throughout much of the United States and southern Canada and winters in Mexico and Central America (Rosenfeld and Biefeldt 1993). Nests are often constructed near water and are vigorously defended. Eggs are normally laid in April and hatch after 30 to 36 days. Young fledge after 30 to 35 days. The species can often be located during the breeding season by broadcasting great horned owl (*Bubo virginianus*) territorial calls (Mosher and Fuller 1996). The species forages in a variety of woodland and edge habitats. It feeds primarily on birds, but will also prey on mammals and reptiles (Rosenfeld and Biefeldt 1993). During the winter, Cooper's hawks utilize a wider variety of habitat types for foraging. The species is relatively tolerant of human activities and is known to nest in urban settings. The Cooper's hawk is listed as a Species of Special Concern by CDFG.

No Cooper's hawks were observed during breeding bird surveys in 1994 or 2000. However, appropriate nesting habitat is present along Copeland Creek and in the oak woodland onsite and the species could breed there in subsequent years. Potential foraging habitat is also present for Cooper's hawk throughout the study area, particularly along the riparian corridors and in the oak woodlands. Cooper's hawks have been observed at Sonoma State University (Miller 2000) and the species nests in the Sonoma Mountains east of the project site (Burridge 1995).

Golden eagle (*Aquila chrysaetos*). The golden eagle is a large, wide-ranging raptor that inhabits grassland and savanna habitats in hilly and mountainous terrain. California ground squirrels and hares are primary food sources. Nests are usually placed on cliff faces or in large trees and are easily disturbed by

human intrusions, and populations are dramatically reduced near urban areas. Suitable buffer zones around nests have been estimated at 800m (Richardson and Miller 1997). Loss of habitat due to urban and agricultural development has contributed towards population declines. A significant population inhabits the Mount Diablo region in the Bay Area and portions of the Los Padres National Forest in the coast range. Conversion of habitat, particularly foraging areas, has contributed to population declines. The golden eagle is listed as a Species of Special Concern and is also listed as "fully protected" by CDFG.

No nesting golden eagles were observed during breeding bird surveys in 1994 or 2000. The species is known to nest in the Sonoma Mountains southeast of the project site (Burridge 1995). Although potential nesting trees are present on the project site, the level of human activity in the area makes it unlikely that the species would nest onsite, particularly west of Petaluma Hill Road. Because nesting adults range many miles from their nests, it is possible that golden eagles could forage on the site. It has not been recorded from Sonoma State University (Miller 2000).

Ferruginous hawk (*Buteo regalis*). The ferruginous hawk is a large raptor that inhabits open habitats in the Great Basin and northern Great Plains during the breeding season and winters throughout arid and semi-arid areas of California. It prefers open grasslands for foraging and will use some agricultural areas. The prey of the ferruginous hawk includes rabbits, ground squirrels and prairie dogs, although birds and reptiles are also eaten (Bechard and Schmutz 1995). In California, the primary prey is California ground squirrels (*Spermophilus beecheyi*). The species often perches on the ground, using sit-and-wait tactics to capture prey. Ferruginous hawks arrive in California between September and October and depart between February and April (Garrison 1990). It typically congregates in grasslands and deserts where mammalian prey is abundant. The wintering population of ferruginous hawk is listed as a Species of Special Concern by CDFG and as a Migratory Nongame Bird of Management Concern by the USFWS.

Ferruginous hawks have been reported at Sonoma State University (Miller 2000). From the mid-1970's to mid-1980's it was regularly seen in fields along both sides of Rohnert Park Expressway between Snyder Lane and Petaluma Hill Road (Burridge, pers. comm.). Potential habitat is available for ferruginous hawk onsite during the winter months throughout the site.

Northern harrier (*Circus cyaneus*). The northern harrier (*Circus cyaneus*) inhabits grasslands, scrub habitats and marshes. Breeding typically occurs in shrubby vegetation near marshes from March to July, although nesting in grassland areas undisturbed by cattle grazing has been documented at various locations, some of which are several miles from water. It feeds primarily on voles and other small mammals, birds, frogs, and insects. The species can be locally abundant where appropriate habitat exists but has decreased in numbers due to conversion of marsh habitat and the effects of pesticides (Erlich, *et al.* 1988). The population in the Bay Area region includes migrants and wintering individuals from approximately September through March. The northern harrier is listed as a Species of Special Concern by CDFG.

No northern harriers were observed during nesting bird surveys in 1994 or 2000. The northern harrier is known to nest in the marshes in the southeastern part of Sonoma County (Burridge 1995). The lack of marsh habitat or ungrazed grassland makes it unlikely that the species nests on the project site. Potential foraging habitat for the northern harrier is present throughout the grasslands and fields on the site. The species has been reported at nearby Sonoma State University (Miller 2000).

White-tailed kite (*Elanus leucurus*). The white-tailed kite is a medium-sized raptor that is distributed across much of the western part of California. It occupies low-elevation grassland, agricultural, wetland, oak

woodland and savanna habitats. It nests in a wide variety of trees and shrubs, either isolated or part of larger stands. Typically, four eggs are laid in February and March, and chicks hatch after 30-32 days. Juveniles are dependent on parents for approximately 2-3 months before they fledge. Juveniles often share their parent's home range for at least one season. During the non-breeding season, the species roosts communally. Nearby open areas are required for foraging, and the species will use certain types of agricultural fields. Food habit studies have demonstrated that voles make up a large proportion of its diet, although other small mammals, birds and insects are also eaten (Dunk 1995). The species hunts during the day primarily by hovering and searching for prey. White-tailed kites in California are generally resident, although they may occupy different areas during the non-breeding and breeding seasons. The species underwent a dramatic reduction in numbers due to habitat loss and hunting. Between the 1940s and early 1980s, the population recovered and its range expanded. More recently, population declines have again been noted, possibly as a result of the conversion of agricultural lands to urban uses (Dunk 1995). In California, the white-tailed kite is listed as "Fully Protected" in the California Fish and Game Code and as a Migratory Nongame Bird of Management Concern by the USFWS.

The white-tailed kite nests in several localities in the southern part of Sonoma County (Burridge 1995). White-tailed kites were observed foraging over the agricultural fields and perching in the trees west of Petaluma Hill Road on 25 April 2000. An individual was also seen perching in an oak in the extreme southeast portion of the parcel on 26 April 2000, along the boundary with Crane Creek Regional Park. Given the timing of these observations early in the breeding season, the individuals could have been migrants through the area or nesting in the vicinity. No nests were present on the project site in 1994 or 2000. Appropriate nesting habitat is present onsite, especially along Copeland and Hinebaugh Creeks and in the oaks east of Petaluma Hill Road. The species is considered to have a high potential to nest onsite in subsequent years. Foraging habitat is present for white-tailed kite throughout the grasslands and agricultural fields present onsite.

Merlin (*Falco columbarius*). The merlin is a small falcon that breeds in wooded areas of the Pacific Northwest, Canada and Alaska. Although it does not nest in California, the species winters in grasslands, savannas and other open habitats throughout the state from October through March. Once a common winter resident in California, numbers have declined markedly since the 1960's (Remson 1978). It preys almost exclusively on small birds, although it also takes small mammals and insects. In California, wintering merlins are concentrated along the coast and in the Central Valley. Wintering merlins are listed as a Species of Special Concern by CDFG.

The merlin occupies a variety of habitat types during the winter months, and it is regularly but infrequently seen along the coast and inland in California (Remsen 1978). Potential habitat is present throughout the site during the winter months.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*). The yellow-billed cuckoo was once a common resident of floodplain riparian woodlands throughout California. The species prefers extensive, dense riparian areas, typically dominated by deciduous hardwoods including willows and cottonwoods. Dense foliage and a well-developed understory appear to be critical. Occupied sites are typically in proximity to open water (Gaines and Laymon 1984). It feeds on caterpillars and other large insects as well as frogs, lizards and fruit (Ehrlich, *et al.* 1988). Nesting pairs occupy larger home ranges than most birds of comparable size, and breed between mid-May and early September. Yellow-billed cuckoos migrate to South America for the winter. Widespread conversion of river floodplains to agricultural use has resulted in significant loss of habitat for the species. Secondary pesticide poisoning has also been identified as a possible factor in the species' decline. The western subspecies is listed as endangered by the state of California and as a Migratory Nongame Bird of Management Concern by the USFWS.

The yellow-billed cuckoo historically inhabited Laguna de Santa Rosa (CNDDB; Burridge 1995) and was observed along Copeland Creek east of Lichau Road as recently as 1975 (CNDDB). However, continued destruction of riparian woodlands and alterations of stream courses for agricultural and flood control purposes have severely degraded riparian habitats in the area. The current distribution of the species is patchy and centers on the upper Sacramento River, the Butte Sink, the South Kern River, and the Colorado River. Most nests are found in areas where the riparian zone is at least 100 meters wide and adjacent to open water (Gaines and Laymon 1984; Small 1994). Such conditions do not occur on the project site, and the species is not expected to nest onsite. No yellow-billed cuckoos were observed during breeding bird surveys in 1994 or 2000.

Long-eared owl (*Asio otus*). The long-eared owl is widely but sparsely distributed in California. Relatively few nest sites are known, and very little natural history information is available. It nests and roosts in riparian woodlands and forages on small rodents in nearby open habitats including grassland. Long-eared owls usually do not build their own nests but take over stick nests built by other raptors, corvids and woodrats (Bloom 1994; Marks, *et al.* 1994). Nesting is virtually unknown in proximity to residential development (Bloom 1994). The only recent comprehensive study occurred in southern California, where there has been an estimated 50-80% decline from historic nesting locations (Bloom 1994). Conversion of grassland foraging habitat has likely contributed greatly to population declines. The long-eared owl is listed by the state as a Species of Special Concern.

The long-eared owl historically occupied Sonoma County (Grinnell & Miller 1944). However, there are no recent nesting records for the species in the County (Burridge 1995). No focused surveys for nocturnal owls were conducted as part of this study. However, due to the proximity of human activities and the lack of recent nesting records in the region, it is highly unlikely that the species nests onsite.

Burrowing owl (*Athene cunicularia*). The burrowing owl is primarily a resident of grassland and desert scrub communities that ranges from central and coastal California throughout the southwest and much of the United States. It is a small (9½ inches), ground-dwelling owl that feeds opportunistically on insects, small mammals, birds, amphibians and reptiles. In the Bay Area region it typically occupies burrows excavated by California ground squirrel (*Spermophilus beecheyi*). It is also able to utilize manmade cover-sites such as culverts and artificial dens (California Burrowing Owl Consortium 1993, 1997; Trulio 1997). In open habitats, the species prefers areas where the grass height is relatively short, including non-native grasslands grazed by livestock (Plumpton and Lutz 1993). The species shows a strong site-fidelity from year to year (Plumpton and Lutz 1993; Feeney 1997). Habitat conversion and secondary poisoning resulting from ground squirrel control efforts have caused declines throughout much of its range, particularly in the Bay Area and surrounding regions (DeSante, *et al.* 1997). The burrowing owl is listed as a state Species of Special Concern and as a Migratory Nongame Bird of Management Concern by the USFWS. It has received increased attention in recent years after the formation of the California Burrowing Owl Consortium (CBOC), a group of scientists that produced a survey protocol endorsed by the California Department of Fish and Game (CBOC 1993, 1997; CDFG 1995).

No burrowing owls were observed during surveys of the grasslands in 1994 or 2000. Due to the general lack of ground squirrels, nesting habitat is marginal on the site. Moreover, it appears that the burrowing owl has been extirpated as a breeding species in Sonoma County in recent history (Burridge 1995; DeSante, *et al.* 1997) and is therefore not expected to inhabit the site.

California horned lark (*Eremophila alpestris actia*). The California horned lark breeds in open grasslands throughout the Central Valley and adjacent foothills and along the central and southern

California coast region (Grinnell and Miller 1944). It is a ground nesting species that requires short vegetation or barren ground, including short-grass prairies, coastal plains, alkali flats and mountain meadows. It also nests in agricultural areas such as row crop stubble, feed lots, and heavily grazed grassland. It feeds primarily on seeds in the winter, while insects make up a larger proportion of the diet in the spring and fall (Beason 1995). Nests are constructed on the ground and between 2 and 5 eggs are laid in late March through May. Juveniles leave the nest after 10 days, but are not fledged until 4 weeks (Beason 1995). It forms flocks in the summer and winter months that are often observed foraging and roosting in cultivated fields and along dirt roads. Declines in populations observed in many western states. The California horned lark is listed as a Species of Special Concern by CDFG.

The horned lark nests in the pastures and flat fields of southeastern Sonoma County. It has also been recorded from Sonoma Mountain east of the project site (Burridge 1995). No horned larks were observed during breeding bird surveys onsite in 1994 or 2000. Appropriate nesting habitat is present on the site however, both to the east and west of Petaluma Hill Road.

Loggerhead shrike (*Lanius ludovicianus*). The loggerhead shrike (*Lanius ludovicianus*) is a wide-ranging species that occupies open habitats including grassland, scrub and open woodland communities. The species typically nests in densely vegetated, isolated trees and shrubs and occasionally man-made structures. It is regularly observed perched on telephone wire, fence posts and prominent shrubs. Loggerhead shrikes feed on a variety of small prey including arthropods, mammals, amphibians, reptiles and birds (Yosef 1996). Since it lacks talons, it often impales prey on thorns or barbed wire. Availability of suitable nesting sites may limit abundance of localized populations. In California, the species does not migrate and is resident year-round. The species is highly territorial, with pairs maintaining territories during the breeding season and individuals maintaining territories during the winter (Yosef 1996). Declines in numbers have been noted across a broad geographical range in the United States. Although the population appears to be relatively stable in the open habitats of California, habitat modification has led to documented population fluctuations in many parts of the species' range (Cade and Woods 1997). The loggerhead shrike is listed as a CDFG Species of Special Concern and as a Migratory Nongame Bird of Management Concern by the USFWS.

The loggerhead shrike is a year-round resident in southern Sonoma County and nesting has been recorded in the immediate vicinity (Burridge 1995). Appropriate nesting and foraging habitat is present throughout the site. However, no nesting loggerhead shrikes were observed during breeding bird surveys in 1994 or 2000.

Tricolored blackbird (*Agelaius tricolor*). Tricolored blackbirds inhabit coastal areas of central and southern California and the Central Valley. The species typically requires fresh water marshes with emergent vegetation surrounded by water for nesting, although thorny brambles, nettles, dense willows or grain fields near water are also used. The microhabitats selected for nesting must provide protection from numerous avian, mammalian and reptilian predators. The species is highly colonial. Historically, tricolored blackbirds congregated in large colonies during the breeding season. Although scattered large colonies still exist, small colonies of fewer than 500 pairs are more common (Beedy, *et al.* 1991). Breeding is highly synchronous. The species is nomadic and smaller colonies will often nest in different areas from year to year. Juveniles are not likely to return to the sites where they were born (DeHaven, *et al.* 1975a). Tricolored blackbirds are regularly observed in mixed flocks with other blackbird species, especially during the non-breeding season, where they will forage and roost together. Tricolored blackbirds forage in grassland and cropland on seeds and insects, the latter primarily during the breeding season (Skorupa, *et al.* 1980). Nesting colonies are highly susceptible to human disturbance, and entire colonies have been known to abandon nests after only a single visit by humans (Beedy, *et al.* 1991).

Agricultural activities are capable of destroying entire colonies, and approximately 70% of the nesting population are on private agricultural lands (Beedy 1998). The population has declined over the past approximately 60 years, particularly in the Central Valley due to habitat conversion of natural wetlands (DeHaven, *et al.* 1975b; Beedy, *et al.* 1991; Beedy 1998). The tricolored blackbird is listed as a Species of Special Concern by CDFG and a Migratory Nongame Bird of Management Concern by the USFWS.

Tricolored blackbirds were observed along Copeland Creek near Sonoma State University in the 1960's and 1970's, with as many as 3000 individuals observed in 1971 (Beedy, *et al.* 1991). Several records of nesting colonies have been recorded in the vicinity of Sonoma State during the 1970's (Burridge 1995). There have been no reports of the species in the area since then. Appropriate nesting habitat still exists in the Himalayan blackberries along Hinebaugh and Copeland Creeks, although there are high levels of human activity along the creek. No tricolored blackbirds were observed on the project site during nesting bird surveys in 1994 or 2000. The species was not observed during surveys conducted by Sonoma State University in 1999 (ESA 2000). The species is nomadic and highly dynamic in distribution over time, and it is possible that the species could nest onsite in the future.

Grasshopper sparrow (*Ammodramus savannarum*). The grasshopper sparrow is a small- to medium sized sparrow that is widely distributed in North America and Central America. It is primarily associated with grasslands with fairly tall grass and little to no shrub cover. The species can also be found in pastures and certain agricultural fields. It feeds primarily on insects and seeds. Grasshopper sparrows nest on the ground between April and July and normally produce 4 or 5 eggs (Rising and Beadle 1996). They are thought to be loosely colonial during the breeding season although numbers in any one area may change over time. In California the species breeds in appropriate habitat along much of the coast and is also found in scattered localities in the western foothills of the Sierra Nevada (Small 1994). During the winter, much of the breeding population in the northern portion of the state migrates to southern California. Due to the widespread conversion of grasslands, populations in California have declined drastically in recent years. The species is listed as a Migratory Nongame Bird of Management Concern by the USFWS.

The grasshopper sparrow is considered a wide-spread, though uncommon breeding species in Sonoma County (Burridge 1995). Grasshopper sparrows were observed onsite during breeding bird surveys in 2000. Two singing males were observed in the agricultural fields to the west of Petaluma Hill Road, and a single singing male was seen in the grasslands near the eastern edge of the site, adjacent to Crane Creek Regional Park. Although the exact nesting locations were not identified, it is suspected that these individuals were nesting in the area.

Yellow warbler (*Dendroica petechia*). The yellow warbler is widely distributed across North America during the spring. The subspecies *D. p. brewsteri* nests in California, Oregon and Washington. Yellow warblers historically nested throughout California with the exception of the high Sierra and the desert regions. Steady and significant declines in California have been recorded, particularly in coastal southern California, the San Joaquin valley and the Sacramento Valley (Remsen 1978). The alteration of native riparian habitats through channelization, grazing and invasion of exotic species has been implicated in this decline (Dunn and Garrett 1997). Parasitism by the brown-headed cowbird (*Molothrus ater*) has also been suggested as a factor in the decline of yellow warblers (Remsen 1978). Yellow warblers occupy dense riparian woodlands typically dominated by willows, but also cottonwoods, maples and sycamores (Dunn and Garrett 1997). The yellow- warbler is listed as a Species of Special Concern by CDFG and as a Migratory Nongame Bird of Management Concern by the USFWS.

The yellow warbler breeds in riparian woodland throughout much of Sonoma County, particularly at inland localities (Burridge 1995). Yellow warblers were heard along Copeland Creek in the southwest corner of the site during breeding bird surveys in 2000. A single individual was observed on 26 June and 24 May, while two individuals were detected on 14 June. This latter date is very late in the season for migrating individuals to be present, and it is assumed that the yellow warbler bred along Copeland Creek in 2000.

Yellow-breasted chat (*Icteria virens*). The yellow-breasted chat is the largest of the warblers of North America. It is generally difficult to see due to its shy behavior. The exception to this is during the breeding season, when males display and call from prominent perches. In California, yellow-breasted chats occupy dense streamside thickets of willows, mulefat, or other riparian species (Dunn & Garrett 1997). It forages primarily on insects, but fruit makes up a large part of its diet in the fall. The species winters in Mexico and Central America. The yellow-breasted chat was once fairly common in riparian woodlands throughout much of California (Grinnell & Miller 1944). The species has declined dramatically across much of its range, particularly in Southern California as the result of urbanization, flood control projects and cowbird parasitism (Remson 1978; Dunn & Garrett 1997). The yellow-breasted chat is listed as a Species of Special Concern by CDFG.

No yellow-breasted chats were observed on the site during breeding bird surveys in 1994 or 2000. Several suspected breeding localities for the yellow-breasted chat have been identified in Sonoma County (Burridge 1995). The closest records are from Annadel State Park and along Sonoma Creek to the northeast of the project site (Burridge 1995). The species was known historically from Laguna de Santa Rosa (Burridge 1995). Due to the poorly developed riparian habitat on the project site, the species has a low potential to nest on the site.

Nesting Birds of Prey. All members of the Order Falconiformes (eagles, harriers, kites and hawks) and Strigiformes (owls), as well as their nests and eggs, are protected while nesting by the California Fish and Game Code. Several birds-of-prey are discussed in the section above. However, there are other birds of prey in the region that could nest onsite.

Surveys for raptor nests were conducted in 2000 throughout the site. Three nests occupied by red-tailed hawks (*Buteo jamaicensis*) were identified onsite. One nest was in a large oak between Keiser Road and Hinebaugh Creek in the western portion of the site, one was in an oak on the northerneastern slope of the prominent ridge in the eastern part of the site, and one was in a eucalyptus along Copeland Creek in the eastern portion of the site. A nest occupied by a pair of great horned owls (*Bubo virginianus*) was observed in a eucalyptus along Copeland Creek in the eastern portion of the site.

4.5 Special-status Mammal Species

The project site is within the range of several special-status mammal species. There are no threatened or endangered mammals expected on the site. Several species of bats have the potential to inhabit the site, although none were observed during a limited survey.

Pallid Bat (*Antrozous pallidus*). The pallid bat inhabits a variety of arid habitats including grassland, scrub and woodlands (Hermanson and O'Shea 1983). It is a year-round resident in central California, where it is usually associated with oak woodland. Daytime roosts are generally in trees, but also occur in rock outcrops and mines. Nocturnal roosts are often under bridges and in rock outcrops. Breeding takes place in the winter, and ovulation is delayed until environmental conditions are appropriate in the spring. One or two young are born in May or June. Maternal colonies generally number less than 100 individuals. Young are

weaned at six to eight weeks (Orr 1954). It feeds on insects and arachnids, including Jerusalem crickets, scorpions and beetles, which are often taken on the ground. The species is very sensitive to disturbance of roost sites. Pallid bats are not known to migrate, and winter hibernaclea are often close to summer roosts. The pallid bat is listed as a Species of Special Concern by CDFG.

Both foraging and roosting habitat is present on the project site for pallid bat. Pallid bats have been recorded from Rancho Olompali, approximately 12 miles SSE of the site. The species is considered to have a moderate potential to inhabit the oak trees and buildings east of Petaluma Hill Road.

Townsend's big-eared bat (*Corynorhinus townsendii*). Townsend's big-eared bat is found throughout much of California, but especially in areas where caves and mines are available for roosting habitat. It inhabits a wide variety of habitats including desert scrub, oak woodland and coniferous forest. It feeds primarily on small moths that are gleaned from vegetation. The species is highly dependent on caves and mines for roost sites, but will also use buildings and bridges that possess "cave-like" features (Kunz and Martin 1982). It is highly sensitive to disturbance of roost sites. It has declined seriously across many parts of California (Williams 1986) and is listed as a Species of Special Concern by CDFG.

Suitable foragin habitat is present for the Townsend's big-eared bat, and the buildings east of Petaluma Hill Road could provide appropriate roosting habitat. The species has been recorded from Rancho Olompali, approximately 12 miles SSE of the site. The species is considered to have a moderate potential to occur on the site.

Yuma myotis (*Myotis yumanensis*). The Yuma myotis inhabits a variety of low-elevation regions in California. It is found in several habitats including grasslands, scrub, woodland and forest (Hoffmeister 1986; Williams 1986). The species is tolerant of human activities and is often found in urban environments. It roosts in buildings, trees, mines, bridges and rock crevices (Williams 1986). A single young is born each year in June or July. Maternity roosts can be very large, numbering up to 2000 individuals. It feeds primarily on emergent aquatic insects and normally forages directly over the surface of still waters including ponds, reservoirs and pools in streams. The species is known to migrate, although such movements are poorly understood. The Yuma myotis is listed as a Species of Special Concern by CDFG.

Both foraging and roosting habitat is present on the project site for Yuma myotis. The species is considered to have a moderate potential occur on the site.

Western mastiff bat (*Eumops perotis californicus*). The western mastiff bat is the largest bat in the United States. In California, the subspecies was historically widely distributed in the Central and San Joaquin Valleys as well as coastal areas from San Francisco Bay to San Diego (Williams 1986). Populations have undergone dramatic reductions, especially in southern California, possibly related to urban and agricultural development. It inhabits a variety of habitats including chaparral, sage scrub, desert scrub and coniferous forest. Daytime roosts are usually greater than 2 meters off the ground and include rock crevices, caves and buildings (Best, *et al.* 1996). Mastiff bats feed on insects, particularly moths, but also crickets and beetles. It often forages high above the ground, up to 1000 feet, and is known to travel up to 25 miles from its roost site to forage. Populations in California are resident and do not migrate. The western mastiff bat is listed as a Species of Special Concern by CDFG.

There is no appropriate roosting habitat for western mastiff bat on the site. However, since it is known to travel long distances to feed over oak woodlands, potential foraging habitat is present east of Petaluma Hill Road.

Table 2. Special-status vertebrate habitat assessment for Vast Oak site, Sonoma Co.

Common Name *Scientific Name*	Status State/Federal	Habitat Affinities	Potential to Occur on Project Site
Fishes			
Central California coast steelhead *Oncorhynchus mykiss*	-/ FT	Coastal rivers and streams with suitable cover and food supply	Present – Reported from Copeland Creek
Amphibians			
California tiger salamander *Ambystoma californiense*	CSC, CP/ FC	Breed in temporary and semi-permanent ponds; use burrows in grassland, oak savanna	Low - Did not breed onsite in '94, '95,'00; Nearest records from east of Highway 101
Northern red-legged frog *Rana aurora aurora*	CSC, CP/ -	Breed in permanent or ephemeral waters; occupy dense undergrowth in moist areas	Low - Not observed onsite in '94, '95, '96,'00; Potential non-breeding habitat present
California red-legged frog *Rana aurora draytonii*	CSC, CP/ FT	Breed in slow creeks, ponds and marshes; use uplands during wet months	Outside range delineated by USFWS; not observed onsite in '94, '95, '96,'00
Foothill yellow-legged frog *Rana boylii*	CSC, CP/ -	Breed in perennial streams with cobble-sized substrate; highly aquatic	Present - observed in Copeland Creek in 1995, 1996 and 2000
Reptiles			
Western pond turtle *Clemmys marmorata*	CSC, CP/ -	Permanent ponds, creeks and rivers; nest in uplands 400m or more from water	Present - observed in Copeland Creek and offsite at SSU ponds; potential habitat along Hinebaugh Creek
Birds			
Cooper's hawk (nesting) *Accipiter cooperi*	CSC/ -	Nest and forage in woodlands; nests 20-60 feet high, lined with flakes of outer bark	Moderate - Did not nest onsite in '94, '00, suitable nesting habitat in Copeland Creek and in oak woodland
Golden eagle *Aquila chrysaetos*	CSC, CFP/ -	Nest in large trees and cliffs; forage in variety of open habitats	Low - Did not nest onsite in '94, '00; Marginal nesting habitat in oak woodland and eucalyptus
Ferruginous hawk (wintering) *Buteo regalis*	CSC/ MNBMC	Forage in grasslands during the winter; nests outside California	Moderate - Suitable wintering habitat available; occurred in area in 1980's
Northern harrier (nesting) *Circus cyaneus*	CSC/ -	Nest in marshes, nearby open habitats, usually on the ground; forage mostly in grasslands	Low - Did not nest onsite in '94, '00; potential nesting habitat in ungrazed grassland
White-tailed kite (nesting) *Elanus leucurus*	CFP/ MNBMC	Nest in trees; forage in open habitats including agricultural fields; roost in colonies at night	Present - Observed in '95, '00, but did not nest onsite in '00; nesting habitat on Copeland Creek and in oaks
Merlin (wintering) *Falco columbarius*	CSC/ -	Winter in grassland, savanna, woodland; nest outside California	Low - Wintering habitat available; rare winter resident in Sonoma County
Western yellow-billed cuckoo (nesting) *Coccyzus americanus occidentalis*	SE/ MNBMC	Nest in dense under-story along willow and cottonwood riparian forest	Very low – Known historically from Copeland Creek, but no recent nesting records; Did not nest onsite in '94, '00
Long-eared owl (nesting) *Asio otus*	CSC/ -	Prefers dense riparian woodlands, also uses forests; highly sensitive to humans	Very low - No recent nesting records from Sonoma Co.; habitat marginal
Burrowing owl *Athene cunicularia*	CSC/ MNBMC	Nest in grasslands, open scrub with suitable burrows; can become tolerant to humans	Low - No recent nesting records from Sonoma Co.
California horned lark *Eremophila alpestris actia*	CSC/ -	Nest in grasslands that are short and sparse	Moderate - Did not nest onsite in '94, '00; potential nesting habitat in grazed grassland
Loggerhead shrike *Lanius ludovicianus*	CSC/ MNBMC	Nest in trees and shrubs; forages in habitats; regularly uses look-out perches open	Moderate - Did not nest onsite in '94, '00; potential nesting habitat on Copeland Creek and in oak woodland
Tricolored blackbird (nesting) *Agelaius tricolor*	CSC/ MNBMC	Nest in colonies in fresh-water marshes or dense brambles; forage in grasslands	Low - Nested on Copeland Creek in 60's and 70's; Did not nest onsite in '94, '00
Grasshopper sparrow (nesting) *Ammodramus savannarum*	-/ MNBMC	Grasslands with little or no shrub cover; pastures; certain agricultural fields	Present - observed in grasslands and fallow fields in '00

Table 2 (Continued). Special-status vertebrate habitat assessment for Vast Oak site, Sonoma Co.

Common Name *Scientific Name*	Status State/Federal	Habitat Affinities	Potential to Occur on Project Site
Yellow warbler *Dendroica petechia brewsteri*	CSC/ MNBMC	Nest in riparian habitats; prefer willows and cottonwoods near water	Present – Observed on Copeland Creek (western portion) during nesting season in '00
Yellow-breasted chat (nesting) *Icteria virens*	CSC/ -	Nest in low trees and shrubs in riparian zones or along edge of woodland	Low - Did not nest onsite in '94, '00; habitat marginal
Nesting Raptors *Various*	3503.5/ -	Various	Red-tailed hawk and Great horned owl nests present onsite in '00
Mammals			
Pallid bat *Antrozous pallidus*	CSC/-	Roosts in caves, trees and buildings; forages in variety of habit	Moderate - Suitable roosting and foraging habitat present; known from region
Townsend's big-eared bat *Corynorhinus townsendii*	CSC/ -	Roosts in caves, buildings, hollow redwoods; forages in variety of habitats	Moderate - Suitable foraging habitat present ; known from region
Yuma myotis *Myotis yumanensis*	CSC/ -	Variety of habitats at lower elevations; roosts in buildings, trees and rock outcrops	Moderate - Suitable roosting and foraging habitat present
Western mastiff bat *Eumops perotis*	CSC/ -	Roosts in rock crevices, occasionally buildings; forages in open habitats	Low - No roosting habitat present

Status Codes:

Status -	State	SE	State-listed as Endangered under California Endangered Species Act (CESA)
		ST	State-listed as Threatened under CESA
		SCE	State candidate for listing as Endangered
		SCT	State candidate for listing as Threatened
		CSC	California Special Concern species designated by the Department of Fish and Game (DFG)
		CFP	Fully Protected Species under the Fish and Game Code of California
		CP	Protected Species under the California Code of Regulations
		3503.5	Protected nesting birds of prey (Orders Falconiformes and Strigiformes) under Fish and Game Code Section 3503.5
Status -	Federal	FE	Federally-listed as Endangered under Federal Endangered Species Act (ESA)
		FT	Federally-listed as Threatened under ESA
		FPE	Federally proposed for listing as Endangered under ESA
		FPT	Federally proposed for listing as Threatened under ESA
		FPD	Federally proposed for Delisting
		FC	Federal candidate species (former Category 1 candidates)
		MNBMC	Fish and Wildlife Service: Migratory Nongame Birds of Management Concern

5.0 CONCLUSIONS

Several special-status vertebrate species inhabit the region or occurred in the region historically and were considered to have some potential to occur on the project site. Focused surveys, habitat suitability assessments, and a literature review were conducted to determine the likelihood that each species could occur on the Vast Oak project site.

The central California coast steelhead has been reported from Copeland Creek and is the only threatened or endangered vertebrate currently known from the site. The site is outside of the range of the federally threatened California red-legged frog as delineated by the USFWS (1996). Nocturnal surveys for red-legged frogs were conducted on five occasions between 1995 and 2000, and none were observed. Aquatic sampling for red-legged frog larvae has been carried out on seven occasions between 1994 and 2000, and no evidence of breeding by the species has been detected.

Five other special-status species were observed onsite during field studies: white-tailed kite, grasshopper sparrow, foothill yellow-legged frog, western pond turtle and yellow warbler. Although the white-tailed kite, a CDFG fully protected species, did not nest on the site in 1994 or 2000, suitable nesting habitat is available along Copeland Creek and in the oak woodland onsite. Three grasshopper sparrows, a USFWS Migratory Nongame Bird of Management Concern, were observed singing onsite during the nesting season, and it is strongly suspected that the species nests in the agricultural fields and grassland both east and west of Petaluma Hill Road. The foothill yellow-legged frog and western pond turtle, CDFG protected species and species of special concern, and the yellow warbler, a CDFG species of special concern and USFWS Migratory Nongame Bird of Management Concern, were detected along Copeland Creek. Although these species are expected to largely remain within the riparian corridor present along Copeland Creek, some use of adjacent upland areas is expected by all the species. Foothill yellow-legged frogs must escape high waters during the winter and have been recorded up to 150 feet from aquatic habitats. Western pond turtles also must escape high water and will travel up to 2,500 feet to construct nests in grasslands, agricultural fields and other open habitats. Suitable nesting habitat for the yellow warbler is present along Copeland Creek in the western portion of the site. Copeland Creek in the eastern portion of the site lacks riparian cover, and does not provide habitat for yellow warblers.

The Cooper's hawk, California horned lark, loggerhead shrike, pallid bat, Townsend's big-eared bat and Yuma myotis are considered to have a moderate potential to inhabit the study site during the breeding season. The ferruginous hawk has a moderate potential to occur on the site during the winter. The rest of the specials-status species under consideration are considered to have a low potential to inhabit the study site due to the lack of breeding, nesting or wintering habitat, the lack of recent records from the region, and/or the lack of observations during focused surveys.

6.0 REFERENCES

Alley, D.W. 1999. Comparison of juvenile steelhead densities, population estimates and habitat conditions for Soquel Creek, Santa Cruz County, California; 1997-98; with expected adult returns. Brookdale, California. Prepared for: Soquel Creek Water District, Soquel, California. Dated May.

Anderson, J. 2000. Local Resident. Vast Oak Property, Rohnert Park. Meeting on 25 April 2000.

Arnold, R.A., Ph.D. 1994. Vast Oak East project site near Rohnert Park, surveys for special-status aquatic invertebrates. Pleasant Hill, California. Prepared for: Quaker Hill Development Corporation, Healdsburg.

Beason, R. C. 1995. Horned Lark (*Eremophila alpestris*) In A. Poole and F. Gill [eds], The Birds of North America, No. 195. Acad. Nat. Sci. Philidalphia ; and Amer. Onithol. Union, Washington, D. C.

Bechard, M.J., and J.K. Schmutz. 1995. Ferruginous Hawk (*Buteo regalis*). In A. Poole and F. Gill [eds], The Birds of North America, No. 172. Acad. Nat. Sci. Philidalphia; and Amer. Onithol. Union, Washington, D. C.

Beedy, E.C. 1998. Tricolored blackbird (*Agelaius tricolor*) status update and management suggestions. Sacramento, CA. Paper presented at The Wildlife Society Western Section 1998 Annual Conference. February 11-14, 1998, Sacramento, CA.

Beedy, E.C., S.D. Sanders, and D.A. Bloom. 1991. Breeding status, distribution , and habitat associations of the tricolored blackbird (*Agelaius tricolor*), 1850-1989. June 21, 1991. Jones & Stokes Associates, Inc. (JSA 88-187.) Sacramento, CA. Prepared for U.S. Fish and Wildlife Service, Sacramento, CA.

Best, T. L. W. M. Kiser, and P. W. Freeman. 1996. *Eumops perotis.* Mammalian Species 534: 1-8.

Biosearch Wildlife Surveys. 1996. Special status amphibian and reptile survey, Vast Oak West Property, Sonoma County CA. Prepared for: Quaker Hill Development Corporation.

Biosearch Wildlife Surveys. 1997. Special status amphibian and reptile survey, Vast Oak East Property, Sonoma County CA. Prepared for: Quaker Hill Development Corporation.

Bloom, P. H. 1994. The biology and current status of the long-eared owl in coastal southern California. Bull. Southern California Acad. Sci. 93:1-12.

Bulger, J. B. 1999. Terrestrial activity and conservation of California red-legged frogs (*Rana aurora draytonii*) in forested habitats of Santa Cruz County, California. Prepared for Land Trust of Santa Cruz County.

Burridge, B. 1995. Sonoma County Breeding Bird Atlas. Madrone Audubon Society.

Cade, T. J., and C. P. Woods. 1997. Changes in distribution and abundance of the loggerhead shrike. Conservation Biology, Pages 21-31, Volume 11, No. 1.

California Burrowing Owl Consortium (CBOC). 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. Alviso, California.

California Burrowing Owl Consortium (CBOC). 1997. Burrowing owl survey protocol and mitigation guidelines (Appendix B). J. Raptor Res. Report 9:171-177.

California Department of Fish and Game (CDFG). 1995. Staff Report on Burrowing Owl Mitigation. Sacramento, California.

California Department of Fish and Game (CDFG). 2000. Special animals. Natural Heritage Division, Natural Diversity Data Base. July 2000.

Dalton, P.D. 1999. Endangered and threatened species; proposed rule governing take of threatened Snake River, Central California Coast, South/Central California Coast, Lower Columbia River, Central Valley California, Middle Columbia River and Upper Willamette River Evolutionarily Significant Units (ESUs) of west coast steelhead. Federal Register, Vol. 64, No. 250, 73479-73506.

DeGange, A. 1999. Endangered and threatened wildlife and plants; proposal to remove the Aleutian Canada goose from the list of endangered and threatened wildlife. Dated 3 August.

DeHaven, R.W., F.T. Crase and P.P. Woronecki. 1975a. Movements of tricolored blackbirds banded in the central valley of California, 1965-1972. Bird Banding, Vol. 46, No. 3.

DeHaven, R.W., F.T. Crase and P.P. Woronecki. 1975b. Breeding status of the tricolored blackbird, 1969-1972. Calif. Fish and Game 61(4):166-180.

DeSante, D. F., E. D. Ruhlen, S.L. Adamany, K.M. Burton and S. Amin. 1997. A census of burrowing owls in California in 1991. J. Raptor Res. Report 9:38-48.

Dunk, J. R. 1995. White-tailed kite (*Elanus leucurus*). *In* A. Poole and F. Gill [eds], The Birds of North America, No. 178. Acad. Nat. Sci. Philidalphia ; and Amer. Onithol. Union, Washington, D. C.

Dunn, J. L. and K. L. Garrett. 1997. A Field Guide to Warblers of North America. Houghton Mifflin Company.

Environmental Science Associates (ESA). 1999. Sonoma state university master plan revision environmental impact report SCH# 93013045 (draft). San Francisco, California. Prepared for: Sonoma State University Facilities Services Department. Dated 1 November.

Environmental Science Associates (ESA). 2000. Sonoma state university master plan revision environmental impact report SCH# 93013045 (response to comments document). San Francisco, California. Prepared for: Sonoma State University Facilities Services Department. Dated 20 March.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. The birder's handbook. Simon & Schuster Inc., New York.

Feeney, L.R. 1997. Burrowing owl site tenacity associated with relocation efforts. J. Raptor Res. Report 9:132-137.

Fisher, R. N., and H. B. Shaffer. 1996. The decline of amphibians in California's great central valley. Conservation Biology, Pages 1387-1397, Volume 10, No. 5.

Gaines, d. and S.A. Laymon. 1984. Decline, status and preservation of the yellow-billed cuckoo in California. Western Birds 15: 49-80.

Garrison, B. A. 1990. Trends in winter abundance and distribution of ferruginous hawks in California. Trans. West. Sect. Wildl. Soc., 26:1990.

Grinnell, J. and A. H. Miller. 1944. The Distribution of the Birds of California. Pacific Coast Avifauna 27.

Hall, 1981. The Mammals of North America. John Wiley and Sons. New York.

Hayes, M.P. and M.R. Jennings. 1986. Decline of Ranid Frog Species in Western North America: are Bullfrogs (*Rana catesbeiana*) Responsible? Journal of Herpetology 20:490-509.

Hayes, M.P. and M.R. Jennings. 1988. Habitat Correlates of Distribution of the California Red-legged Frog (*Rana aurora draytonii*) and the Foothill Yellow-legged Frog (*Rana boylii*): Implications for Management. In R.C. Szaro, K.E. Severson, and D.R. Patton tech. Corr., Management of Amphibians, Reptiles and Small Mammals in North America. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station. Gen. Tech. Rpt. RM-166.

Hayes, M.P and M.M. Miyamoto. 1984. Biochemical, behavioral and body size differences between *Rana aurora aurora* and *R. a. draytonii.* Copeia 1984(4): 1018-1022.

Hermanson, J. W. and T. J. O'Shea. 1983. *Antrozous pallidus*. Mammalian Species 213: 1-8.

Holland, D. C., M. P. Hayes and E. McMillan. 1990. Late summer movement and mass mortality in the California tiger salamander (*Ambystoma californiense*). Southwestern Naturalist. 35:217-220.

Holland, D.C. 1992. A synopsis of the distribution and current status of the western pond turtle in (*Clemmys marmorata*) Oregon. Report prepared for Nongame Division Oregon Department of Fish and Wildlife.

Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press, Tucson. 602 pp.Ingles, L.G. 1965. Mammals of the Pacific states. Stanford University Press, Stanford, California. 506 pp.

Jennings, M. R. 1996. *Ambystoma californiense* (California tiger salamander). Burrowing ability. Herpetological Review 27(4).

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game Contract # 8023. Inland Fisheries Division, Rancho Cordova, California.

Kaufman, K. 1996. Lives of North American birds. Peterson Natural History Companions. Houghton Mifflin Co.

Kunz, T. H. and R. A. Martin. 1982. *Plecotus townsendii.* Mammalian Species 175: 1-6.

Kupferberg, S. J. 1996. Hydrologic and geomorphic factors affecting conservation of a river-breeding frog (*Rana boylii*). Ecological Applications, Vol. 6(4).

Loredo, I. and D. Van Vuren. 1996. Reproductive Ecology of a Population of the California Tiger Salamander. Copeia, 1996 (4), pages 895-901.

Manning, R. W. and J. Knox Jones. 1989. *Myotis evotis.* Mammalian Species 329: 1-5.

Marks, J.S., D.L. Evans, and D.W. Holt. 1994. Long-eared owl (*Asio otus*). *In* A. Poole and F. Gill [eds], The Birds of North America, No. 133. Acad. Nat. Sci. Philidalphia; and Amer. Onithol. Union, Washington, D. C.

Miller, K. J., A. Willy, S. Larsen, and S. Morey. 1996. Endangered and threatened wildlife and plants; determination of threatened status for the California red-legged frog. Federal Register: Vol. 61, No. 101.

Miller, S. 2000.The Birds of Sonoma State University: www.sonoma.edu/projects/campus/birds/list.html

Mosher, J.A. and M.R. Fuller. 1996. Surveying woodland hawks with broadcasts of great horned owl vocalizations. Wildlife Society Bulletin, 24(3):531-536.

Moyle, P.B. 1973. Effects of introduced bullfrogs, *Rana catesbeiana,* on the native frogs of the San Joaquin Valley, California. Copeia, 1973: 18-22.

Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake. 1995. Fish species of special concern in California, second edition. University of California, Davis. Prepared for: Department of Fish and Game, Inland Fisheries Division, Rancho Cordova (Contract No. 21281F). Dated June.

Northen, Philip, PhD. 1995. Professor, Sonoma State University, Cotati, California – telephone conversation

O'Farrell, M. J. and E. H. Studier. 1980. *Myotis thysanodes.* Mammalian Species 137: 1-5.

Orr, R. T. 1954. Natural history of the pallid bat, *Antrozous pallidus.* Proc. California Acad. Sci. 28: 165-264.

Plumpton, D. L. and R. S. Lutz. 1993. Nesting habitat use by burrowing owls in Colorado. The Journal of Raptor Research 27 (4):175-179.

Rathbun, G.B., N. Siepel, and D. Holland. 1992. Nesting behavior and movements of western pond turtles (*Clemmys marmorata*). The Southwestern Naturalist, Vol. 37, No. 3, September.

Rathbun, G.B., M.R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, California. Unpublished report, National Ecology Research Center, Piedras Blancas Research Station, San Simeon, California, 93452-0070. Cooperative Agreement 14-16-009-91-1909.

Remsen, J. V. Jr. 1978. Bird species of special concern in California. Nongame Wildlife Investigations, Wildlife Management Branch Admisistrative Rep. No. 78-1.

Richardson, C.T. and C.K. Miller. 1997. Recommendations for protecting raptors from human disturbance: a review. Wildlife Society Bulletin 25(3): 634-638.

Rising, J.D. and D.D. Beadle. 1996. A Guide to the Identification and Natural History of the Sparrows of the United States and Canada. Academic Press.

Rosenfield, R. N. and J. Biefeldt. 1993. Cooper's Hawk (*Accipiter cooperii*). In A. Poole and F. Gill [eds], The Birds of North America, No. 75. Acad. Nat. Sci. Philidalphia;

Shaffer, H.B, R. N. Fisher and S. E. Stanley. 1993. Status Report: the California tiger salamander (*Ambystoma californiense*). Final report for California Department of Fish and Game, Inland Fisheries Division Contracts FG 9422 and FG 1383.

Skorupa, J.P., R.L. Hothem and R.W. DeHaven. 1980. Foods of breeding tricolored blackbirds in agricultural areas of Merced County, California. Condor, 82:465-467.

Small, A. 1994. California birds: their status and distribution. Ibis publishing Company.
Sonoma County Water Agency. 1999. Pre-discharge Notification Nationwide Permit 27. Copeland Creek Restoration Project, Grossi, Anderson and Sangiacomo Properties, Sonoma County, California. Submitted to U.S. Army Corps of Engineers.
Sorensen, P.C. 1994. Endangered and threatened wildlife and plants; 12-month petition finding for the California tiger salamander. Federal Register, 59: 18353-18354.
Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Co., Boston MA.
Stromberg, L. P. Wetlands Consultant. 1995a. Results of survey for special-status plant species, Vast Oak East, Sonoma County, California.
Stromberg, L. P. Wetlands Consultant. 1995b. Results of survey for special-status plant species, Vast Oak West, Sonoma County, California.
Stromberg, L. P. Wetlands Consultant. 1996. Results of survey for special-status plant species, Vast Oak West, Sonoma County, California.
Stromberg, L. P. Wetlands Consultant. 1997a. Results of survey for special-status plant species, Vast Oak East, Sonoma County, California.
Stromberg, L. P. Wetlands Consultant. 1997b. Results of survey for special-status plant species, Vast Oak West, Sonoma County, California.
Stromberg, L. P. Wetlands Consultant. 1998a. Results of survey for special-status plant species, Vast Oak East, Sonoma County, California.
Stromberg, L. P. Wetlands Consultant. 1998b. Results of survey for special-status plant species, Vast Oak West, Sonoma County, California.
Stromberg, L.P., Ph.D. 1998c. Delineation of farmed wetlands, farmed wetland pastures, and other waters of the United States, Vast Oak west site, Sonoma County, California. San Rafael, California. Prepared for: Quaker Hill Development Corporation, Healdsburg, California. Dated 22 June.
Stromberg, L. P. Wetlands Consultant. 1999a. Results of survey for special-status plant species, Vast Oak East, Sonoma County, California.
Stromberg, L. P. Wetlands Consultant. 1999b. Results of survey for special-status plant species, Vast Oak West, Sonoma County, California.
Stromberg, L.P., Ph.D. 2000. Submittal of revised and final pre-jurisdictional determination, Vast Oak West Project Site. San Rafael, California. Prepared for: U. S. Army Corps of Engineers, San Francisco, California. Dated 22 June.
Thelander, C. G. and M. Crabtree, editors. 1994. Life on the edge: a guide to California's endangered natural resources: wildlife. Biosystems Analysis, Santa Cruz, California
Trulio, L. 1997. Burrowing owl demography and habitat use at two urban sites in Santa Clara County, California. J. Raptor Res. Report:84-89.
United States Fish and Wildlife Service (USFWS). 1973. Endangered Species Act of 1973 (as Amended 1976, 1977, 1978, 1979, 1982, 1984, 1988).
United States Fish and Wildlife Service (USFWS). 1995. Draft survey protocol for the California red-legged frog (*Rana aurora draytonii*). Sacramento, CA. Dated 13 January 1995.
United States Fish and Wildlife Service (USFWS). 1997. U.S. Fish and Wildlife Service guidance on site assessment and field surveys for California red-legged frogs. February 18, 1997.
Vindum, J. 1995. Herpetologist, California Academy of Sciences, San Francisco. Telephone conversation.
Williams, D. F. 1986. Mammalian species of special concern in California. Wildlife Management Division Administrative Report 86-1.
Yosef, R. 1996. Loggerhead shrike (*Lanius ludovicianus*). In A. Poole and F. Gill [eds], The Birds of North America, No. 231. Acad. Nat. Sci. Philidalphia; and Amer. Onithol. Union, Washington, D. C.

APPENDIX 1. Vertebrate species observed or detected by sign at the Vast Oak Project Site, Sonoma County during field studies performed from 1994-1996 and in 2000.

AMPHIBIANS

Bufonidae
Bufo boreas
Hylidae
Hyla (= Pseudacris) regilla
Ranidae
Rana boylii
Rana catesbeiana

REPTILES

Emydidae
Clemmys marmorata marmorata
Iguanidae
Sceloporus occidentalis
Scincidae
Eumeces skiltonianus

BIRDS

Ardeidae
Ardea herodias
Anatidae
Anas platyrhynchos
Cathartidae
Cathartes aura
Accipitridae
Elanus leucurus
Buteo jamaicensis
Falconidae
Falco sparverius
Phasianidae
Phasianus colchicus
Columbidae
Columba livia
Zenaida macroura
Strigidae
Bubo virginianus
Trochilidae
Calypte anna
Picidae Woodpeckers
Picoides pubescens
Picoides nuttallii
Tyrannidae
Tyrannus verticalis
Sayornis nigricans
Empidonax difficilis
Alaudidae
Eremophila alpestris actia
Hirundinidae
Tachycineta bicolor
Hirundo pyrrhonota
Hirundo rustica
Corvidae
Aphelocoma californica
Cyanocitta stelleri
Corvus brachyrhynchos
Corvus corax
Muscicapidae
Chamaea fasciata
Paridae

True Toads
Western toad
Tree Frogs
Pacific (= chorus) treefrog
True Frogs
Foothill yellow-legged frog
Bullfrog (introduced)

Box and Water Turtles
Northwestern pond turtle
Iguanids
Western fence lizard
Skinks
Western skink

Herons, Egrets and Bitterns
Great blue heron
Swans, Geese, and Ducks
Mallard
American vultures
Turkey vulture
Hawks, Kites and Eagles
White-tailed kite
Red-tailed hawk
Falcons and Caracaras
American kestrel
Grouse and Ptarmigans
Ring-necked pheasant (introduced)
Pigeons and Doves
Rock dove
Mourning dove
Typical Owls
Great horned owl
Hummingbirds
Anna's hummingbird

Downy woodpecker
Nuttall's woodpecker
Tyrant Flycatchers
Western kingbird
Black phoebe
Pacific-slope flycatcher
Larks
California horned lark
Swallows
Tree swallow
Cliff swallow
Barn swallow
Jays, Magpies and Crows
Western scrub-jay
Steller's jay
American crow
Common raven
Wrentit
Wrentit
Titmice and Chickadees

Baeolophus inornatus
Poecile rufescens
Aegithalidae
Psaltriparus minimus
Sittidae
Sitta carolinensis
Regulidae
Regulus calendula
Muscicapidae
Catharus ustulatus
Turdus migratorius
Mimidae
Mimus polyglottos
Sturnidae
Sturnus vulgaris
Emberizidae
Dendroica petechia brewsteri
Pheucticus melanocephalus
Pipilo maculatus
Pipilo crissalis
Ammodramus savannarum
Melospiza melodia
Junco hyemalis
Sturnella neglecta
Agelaius phoeniceus
Euphagus cyanocephalus
Molothrus ater
Fringillidae
Carduelis psaltria
Carpodacus mexicanus

MAMMALS

Mollossidae
Tadarida brasiliensis
Didelphidae
Didelphis virginiana
Leporidae
Sylvilagus audubonii
Sciuridae
Spermophilus beecheyi
Geomyidae
Thomomys bottae
Canidae
Canis latrans
Canis familiarensis
Procyonidae
Procyon lotor
Mustelidae
Mephitis mephitis
Felidae
Felis catus

Oak titmouse
Chestnut-backed chickadee
Bushtits
Bushtit
Nuthatches
White-breasted nuthatch
Kinglets
Ruby-crowned kinglet
Thrushes
Swainson's thrush
American robin
Mimic thrushes
Northern mockingbird
Starlings
European starling (introduced)
Warblers, Sparrows
Yellow warbler
Black-headed grosbeak
Spotted towhee
California towhee
Grasshopper sparrow
Song sparrow
Dark-eyed junco
Western meadowlark
Red-winged blackbird
Brewer's blackbird
Brown-headed cowbird
Finches
Lesser goldfinch
House finch

Free-tailed bats
Mexican free-tailed bat
Opossums
Virginia opossum (introduced)
Rabbits and hares
Audubon's cottontail
Squirrels
California ground squirrel
Pocket gophers
Botta's pocket gopher
Foxes, Wolves and relatives
Coyote
Domestic dog (introduced)
Raccoons and Relatives
Raccoon
Weasels, Skunks and Relatives
Striped skunk
Cats
Feral cat (introduced)