

APPENDIX D

Biological Resources Report

Prepared by

Live Oak Associates

August 2009



LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

BIOTIC EVALUATION

WAL-MART EXPANSION SITE ANTIOCH, CONTRA COSTA COUNTY, CALIFORNIA

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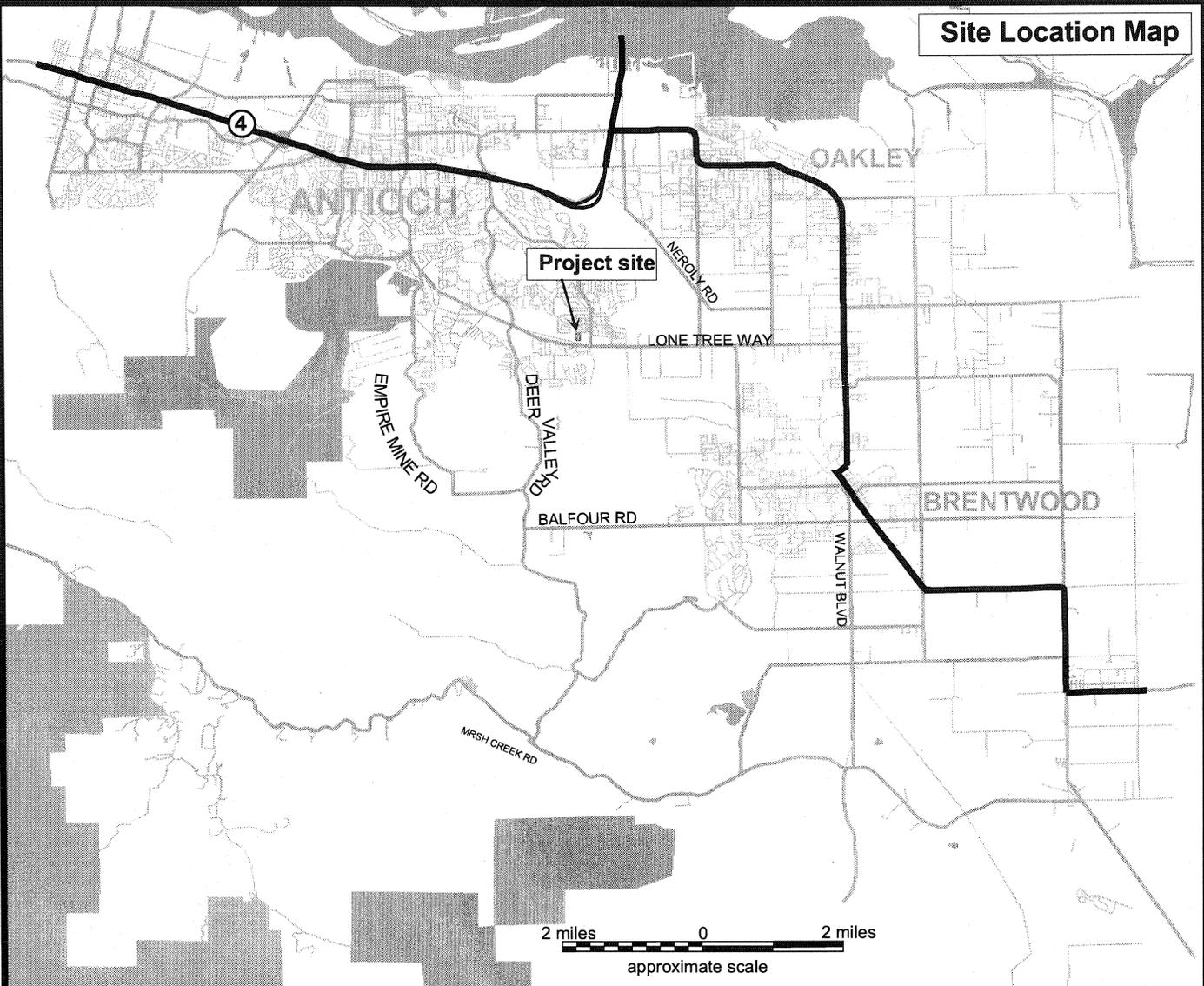
1.0 INTRODUCTION

Live Oak Associates, Inc. (LOA) has prepared the following report, which describes the biotic resources of an approximately 3.7-acre undeveloped portion of a Wal-Mart property located in the City of Antioch, Contra Costa County, California, and evaluates likely impacts to these resources resulting from for eventual site development associated with the expansion of an existing Wal-Mart retail store. The 3.7-acre study area is located in the northwest portion of the Wal-Mart property, which itself is located just northwest of the intersection of Lone Tree Road and Hillcrest Avenue (Figure 1). One habitat type occurs within the boundaries of the study area, and that has been identified as ruderal non-native grassland. The location of the site can be found on the Antioch South U.S.G.S. 7.5' quadrangle in Section 4, Township 1 north, Range 2 east.

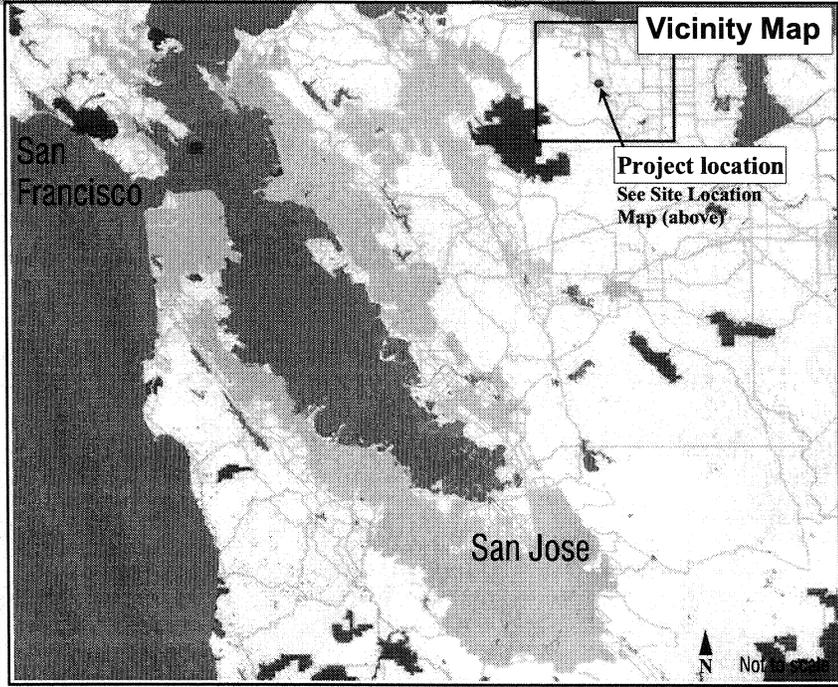
Development projects can damage or modify biotic habitats used by sensitive plant and wildlife species. In such cases, site development may be regulated by state or federal agencies, subject to provisions of the California Environmental Quality Act (CEQA), and/or covered by policies and ordinances of the City of Antioch. This report addresses issues related to: 1) sensitive biotic resources occurring on the study area; 2) the federal, state, and local laws regulating such resources, and 3) mitigation measures that may be required to reduce the magnitude of anticipated impacts. As such, the objectives of this report are to:

- Summarize all site-specific information related to existing biological resources;
- Make reasonable inferences about the biological resources that could occur onsite based on habitat suitability and the proximity of the site to a species' known range;
- Summarize all state and federal natural resource protection laws that may be relevant to possible future site development;
- Identify and discuss project impacts to biological resources likely to occur on the site within the context of CEQA or any state or federal laws; and
- Identify avoidance and mitigation measures that would reduce impacts to a less-than-significant level as identified by CEQA and that are generally consistent with recommendations of the resource agencies for affected biological resources.

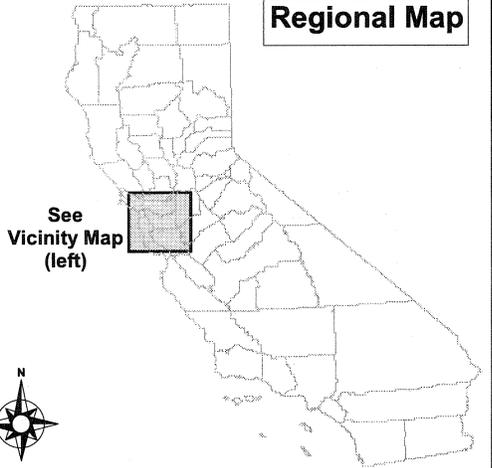
Site Location Map



Vicinity Map



Regional Map



	Live Oak Associates, Inc.		
	Antioch Walmart Site / Vicinity Map		
Date	Project #	Figure #	
6/3/08	760-02	1	

The analysis of impacts, as discussed in Section 3.0 of this report, is based on the known and potential biotic resources of the site, discussed in Section 2.0. Sources of information used in the preparation of this analysis included: 1) the *California Natural Diversity Data Base* (CDFG 2008), 2) the *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2001), and 3) manuals and references related to plants and animals of the region. A reconnaissance level field survey was conducted within the study area in the morning and evening of May 26, 2008 by Live Oak Associates, Inc. (LOA) ecologist Nathan Hale, at which time the principal biotic habitats were identified and the constituent plants and animals of each were noted. Previous studies have been conducted within the study area by LOA, including a site evaluation on April 10, 2005, by LOA ecologist, Melissa Denena, and a protocol-level burrowing owl survey conducted in April 2005.

The proposed project is the expansion of the existing Wal-Mart building and parking lot into the study area (Figure 2). The current building will be enlarged onto a portion of the study area, with the remainder of the open habitat being converted into concrete-paved parking. Upon the completion of the expansion project, the entirety of the ruderal non-native grassland habitat will have been converted to developed land use.

2.0 EXISTING CONDITIONS

The approximately 3.7-acre study area is located in the southern portion of the City of Antioch in Contra Costa County, California. The study area is comprised of an undeveloped section of the larger property which is bounded to the south by Lone Tree Way, to the east by Hillcrest Avenue, to the north by East Antioch Creek and single-family residences, and to the west by commercial development. The study area itself is bounded by existing asphalt parking roadways to the east, south, and west and East Antioch Creek to the north. East Antioch Creek is a channelized, natural-bottom feature. During the May 2008 survey, hydrophytic vegetation and water were present within the bed of the channel, and it appears to eventually flow into the San Francisco Bay. The study area is topographically level at an elevation of approximately 135 feet (40 meters) National Geodetic Vertical Datum (NGVD). The only habitat occurring on the study area is ruderal non-native grassland.

One soil-mapping units, Pescadero clay loam, has been identified on the study area (NRCS, 1977). This alkaline soil was formed in alluvium derived from sedimentary rock and is classified as being poorly drained, with slow permeability. The Pescadero soil series is considered to be hydric with hummocky microrelief; however, drainage features have been installed onsite and the study area has been modified causing surface water that may have at one time pooled onsite to flow into the drains or sheet flow across the site into East Antioch Creek. Typical land uses within this soil are dry-farmed pastures and residential development.

Antioch has a Mediterranean climate with warm to hot dry summers and cool winters. Annual precipitation in the general vicinity of the site averages 13 inches, most of which falls between October and March. Nearly all precipitation falls in the form of rain. Stormwater runoff readily infiltrates the study area's soils; when field capacity has been reached, gravitational water flows into onsite stormwater drains or off the study area into East Antioch Creek, which eventually empties into the San Francisco Bay.

2.1 BIOTIC HABITATS

The study area consists entirely of ruderal non-native grassland habitat (Figure 3). A list of the vascular plants observed within the study area during the April 2005 and May 2008 surveys has

East Antioch Creek
CITY OF ANTIOCH

WAL-MART

HILLCREST AVENUE

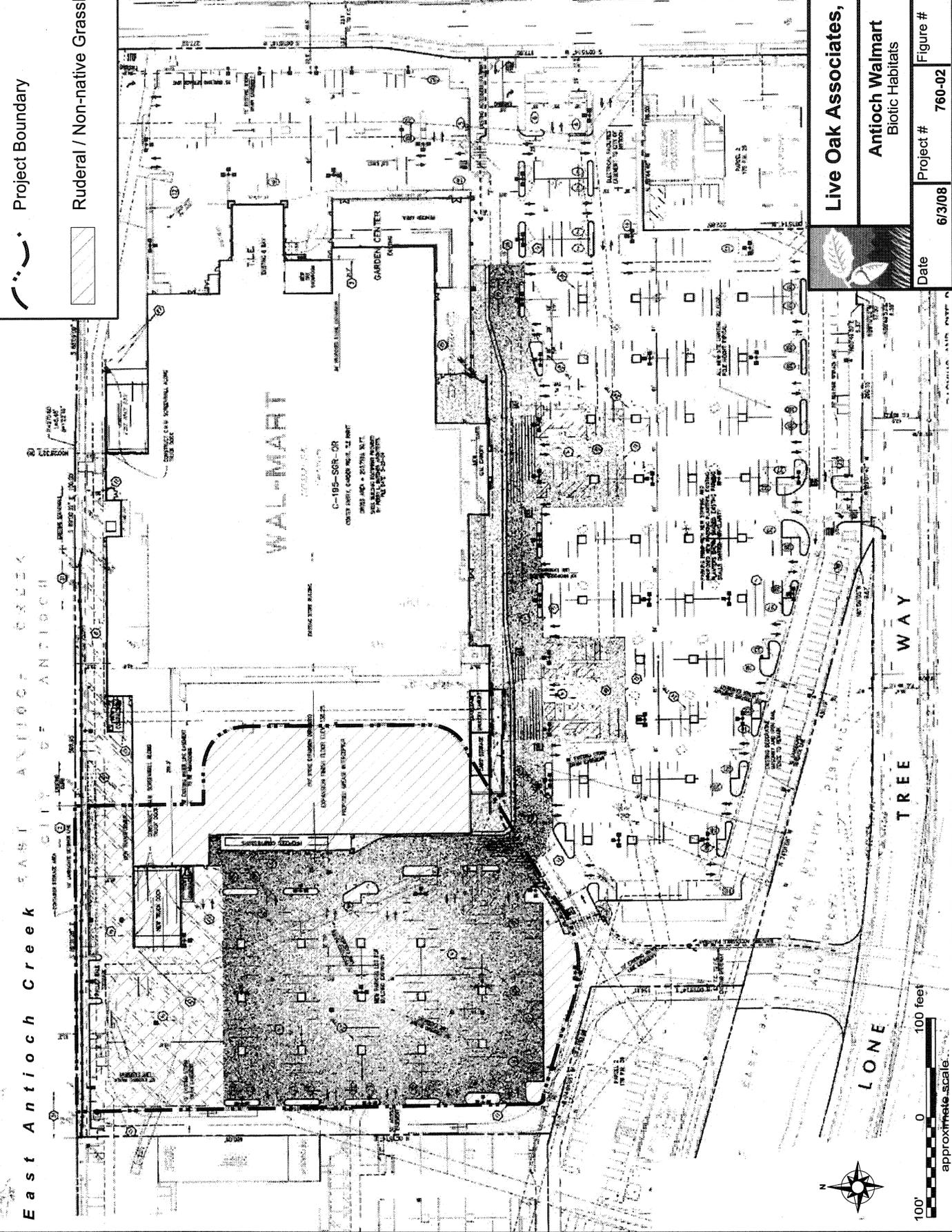
TREE WAY

LONE

LEGEND

Project Boundary

Ruderal / Non-native Grassland



Live Oak Associates, Inc.

Antioch Walmart
Biotic Habitats

Date 6/3/08 Project # 760-02 Figure # 3



been provided in Appendix A. A list of terrestrial vertebrates using, or potentially using, the study area has been provided in Appendix B.

As stated above, the entire study area consists of ruderal non-native grassland habitat. The term “ruderal” refers to habitats that have been heavily disturbed by human factors. Ruderal habitats are characterized by being dominated by non-native grasses and forbs of European origin and typically native vegetation is sparse to non-existent. At the time of the May 2008 survey, the study area supported extremely sparse vegetation, having apparently been disced earlier in the year. Non-native grass species observed onsite included slender wild oats (*Avena barbata*), barnyard barley (*Hordeum murinum* ssp. *leporinum*), ripgut brome (*Bromus diandrus*), and Italian wild rye (*Lolium multiflorum*); while common non-native forbs included black mustard (*Brassica nigra*), hairy vetch (*Vicia villosa*), yellow star thistle (*Centaurea solstitialis*), curly dock (*Rumex crispus*), and red-stemmed filaree (*Erodium cicutarium*). Aside from study area being dominantly barren, what little vegetation is present is mostly comprised of herbaceous species; however a few trees and shrubs were present along the margins. For instance, a single, immature willow (*Salix* sp.) was planted along the southern boundary as part of landscaping associated with the surrounding development. Landscaped trees were also scattered adjacent to the project boundary, along the bank of East Antioch Creek. Species present in this area included a Fremont’s cottonwood (*Populus fremontii*), weeping willow (*Salix babylonica*), and fruit tree (*Prunus* sp.).

Non-native grasslands can provide important habitat to many terrestrial vertebrates. As many as 25 species of reptiles and amphibians, 100 species of birds, and 50 species of mammals are known to use grassland habitats of central California (Mayer and Laudenslayer 1988). A number of these species are expected to utilize grasslands occurring on the study area throughout the year or during part of the year as breeding and foraging habitat. However, a particular habitat’s importance to the wildlife of a region can be affected by many factors including the proximity of other suitable habitat, the amount of available escape cover, the availability of water and food, as well as the amount of surrounding human disturbance. Due to the fact that the study area is located in an area of existing development and is thus considered an infill site, its value as habitat for many wildlife species occurring in the local region is greatly diminished. Nonetheless, some

wildlife species were observed onsite during the May 2008 survey, and still other species, not directly observed, would be expected to use this habitat year-round or seasonally.

The study area provides only marginal habitat for locally occurring amphibian and reptile species. It is possible that individuals occurring in the habitat of East Antioch Creek could move onto the study area from time to time. These species would include western toads (*Bufo boreas*), pacific treefrogs (*Pseudacris regilla*), western fence lizards (*Sceloporus occidentalis*), and gopher snakes (*Pituophis melanoleucus*).

Several species of resident and migratory birds that breed and forage in grassland habitats of Contra Costa County were observed within the study area. A pair of burrowing owls (*Athene cunicularia*) was observed residing in an onsite burrow during the May 2008 survey. Other birds identified as foraging within or flying over the site during this survey include a number of house finches (*Carpodacus mexicanus*), mourning doves (*Zenaida macroura*), American crows (*Corvus brachyrhynchos*), barn swallow (*Hirundo rustica*), and a northern mockingbird (*Mimus polyglottos*). A number of other songbird species would be expected to forage on the site; however, aside from the burrowing owls, the occurrence of raptor species would be limited due to the lack of trees of suitable size for breeding as well as the disturbed nature of the study area and its isolation from more suitable grassland habitat.

Several species of mammals were either observed in the grassland habitat of the study area or would be expected to occur there from time to time. A fairly dense population of California ground squirrels (*Spermophilus beecheyi*) was observed onsite during the May 2008 survey. Other small mammals that are likely to occur onsite include the Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), California meadow vole (*Microtus californicus*), and black-tailed jackrabbit (*Lepus californicus*). Small mammals often attract predators, including reptiles and raptors previously discussed, as well as mammalian predators. Mammalian predators that are well adapted to human disturbance such as Virginia opossum (*Didelphis virginiana*) and raccoon (*Procyon lotor*) may be attracted to the study area as a place to forage for prey. However, due to the site's urban surroundings, medium-sized predators such as the non-native red fox (*Vulpes vulpes*), coyote (*Canis latrans*), and bobcat (*Felis rufus*) would be expected to occur onsite infrequently if at all.

2.2 MOVEMENT CORRIDORS

Many terrestrial animals need more than one biotic habitat in order to perform all of their biological activities. With increasing encroachment of humans on wildlife habitats, it has become important to establish and maintain linkages, or movement corridors, for animals to be able to access locations containing different biotic resources that are essential to maintaining their life cycles. Terrestrial animals use ridges, canyons, riparian areas, and open spaces to travel between their required habitats.

The importance of an area as a movement corridor depends on the species in question and its consistent use patterns. Animal movements generally can be divided into three major behavioral categories:

- Movements within a home range or territory;
- Movements during migration; and
- Movements during dispersal.

While no detailed study of animal movements has been conducted for the study area, knowledge of the site, its habitats, and the ecology of the species potentially occurring onsite permits sufficient predictions about the types of movements occurring in the region and whether or not proposed development would constitute a significant impact to animal movements.

As noted in Section 2.1, the disturbed nature of the site limits the number of amphibians, reptiles, birds, and mammals that use the site. The more common species that occur have largely utilized the site as part of their home range and are known to be adapted to human-induced disturbances. These animals would move through all portions of the site, as they would also do on other disturbed habitats throughout the county. Due to the low habitat value of the project site, it is likely only used in a limited way and does not provide a regionally unique corridor of movement. Furthermore, the project site is expected to facilitate regional movements of only some wildlife species, as animals would have to travel through large areas of marginal to poor habitat (i.e., disturbed, developed, and agricultural lands) before reaching the study area.

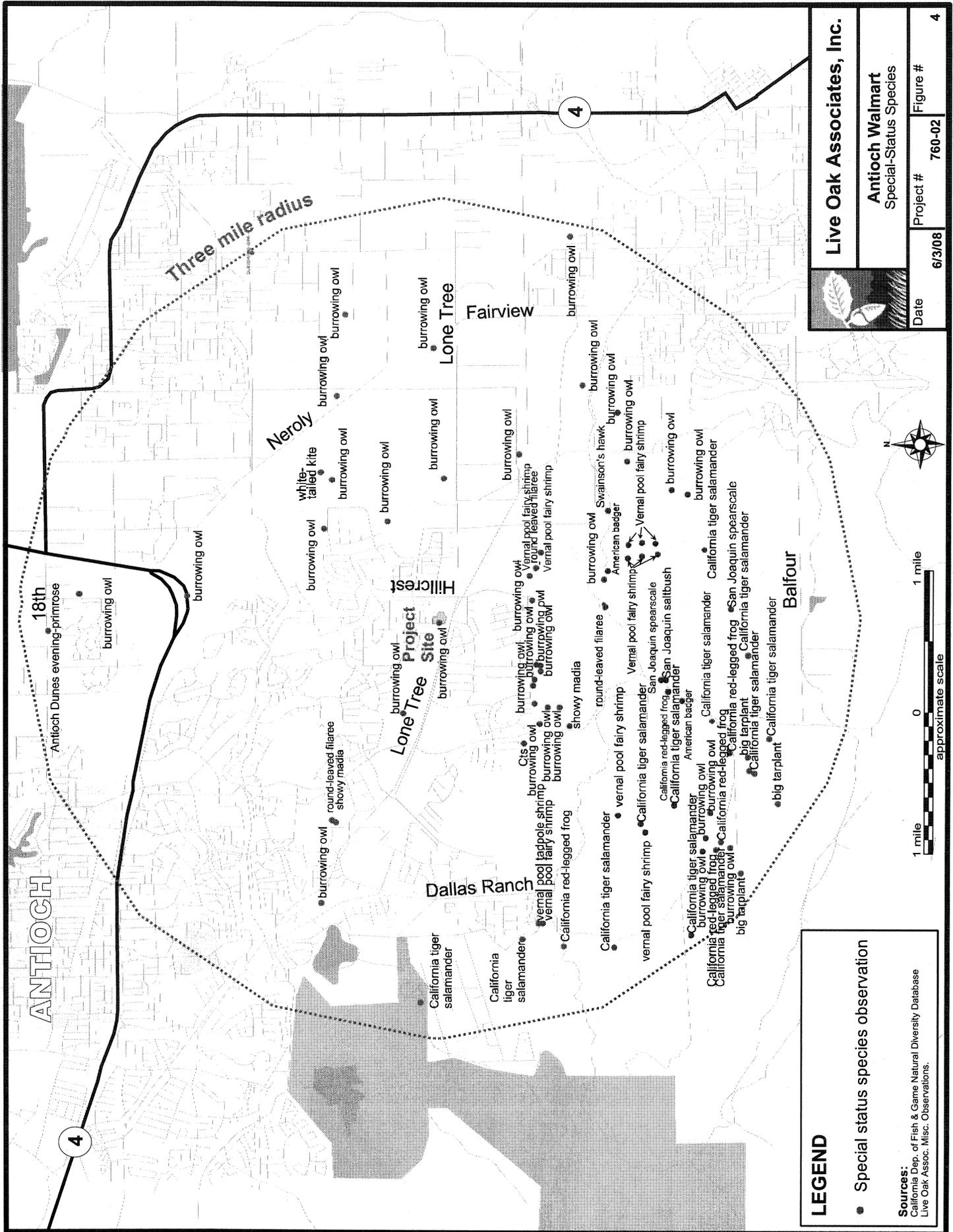
2.3 SPECIAL STATUS PLANTS AND ANIMALS

Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered “rare” and are vulnerable to extirpation as the state’s human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.2, state and federal laws have provided the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as threatened or endangered under state and federal endangered species legislation. Others have been designated as “candidates” for such listing. Still others have been designated as “species of special concern” by the CDFG. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened or endangered (CNPS 2001). Collectively, these plants and animals are referred to as “special status species.”

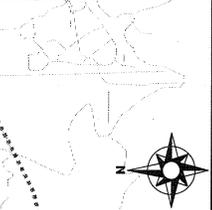
A number of special status plants and animals occur in the vicinity of the study area. These species, and their potential to occur in the study area, are listed in Table 1 on the following pages. Sources of information for this table included *California’s Wildlife, Volumes I, II, and III* (Zeiner et. al 1988-1990), *California Natural Diversity Data Base* (CDFG 2008), *Endangered and Threatened Wildlife and Plants* (USFWS 2008), *Annual Report on the Status of California State Listed Threatened and Endangered Animals and Plants* (CDFG 2008), and *The California Native Plant Society’s Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2001). This information was used to evaluate the potential for special-status plant and animal species to occur on site. Figure 4 shows the location of special status species found by the California Natural Diversity Data Base (CNDDDB) within a three-mile radius of the project site. Figure 5 shows the location of San Joaquin kit fox observed within a ten-mile radius of the project site. It is important to note that CNDDDB is a volunteer database and, therefore, it may not contain all known or gray literature records of special status species occurrences.

A search of published accounts for all of the relevant special status plant and animal species was conducted for the Antioch South U.S.G.S 7.5 minute quadrangle in which the project site occurs,

as well as for the eight surrounding quadrangles (Clayton, Diablo, Tassajara, Brentwood, Byron Hot Springs, Jersey Island, Honker Bay, and Antioch North) using the California Natural Diversity Data Base Rarefind 2008. Plant species reviewed for these quadrangles included those on CNPS List 1A, 1B, 2, and 4.



Live Oak Associates, Inc.		
Antioch Walmart Special-Status Species		
Date 6/3/08	Project # 760-02	Figure # 4



LEGEND

- Special status species observation

Sources:
 California Dep. of Fish & Game Natural Diversity Database
 Live Oak Assoc. Misc. Observations.

LEGEND

▲ San Joaquin Kit Fox observation

Sources:
California Dep. of Fish & Game Natural Diversity Database
Recovery Plan for Upland Species of the San Joaquin Valley

Live Oak Associates, Inc.

Antioch Walmart
San Joaquin Kit Fox

Date 6/3/08 Project # 760-02 Figure # 5

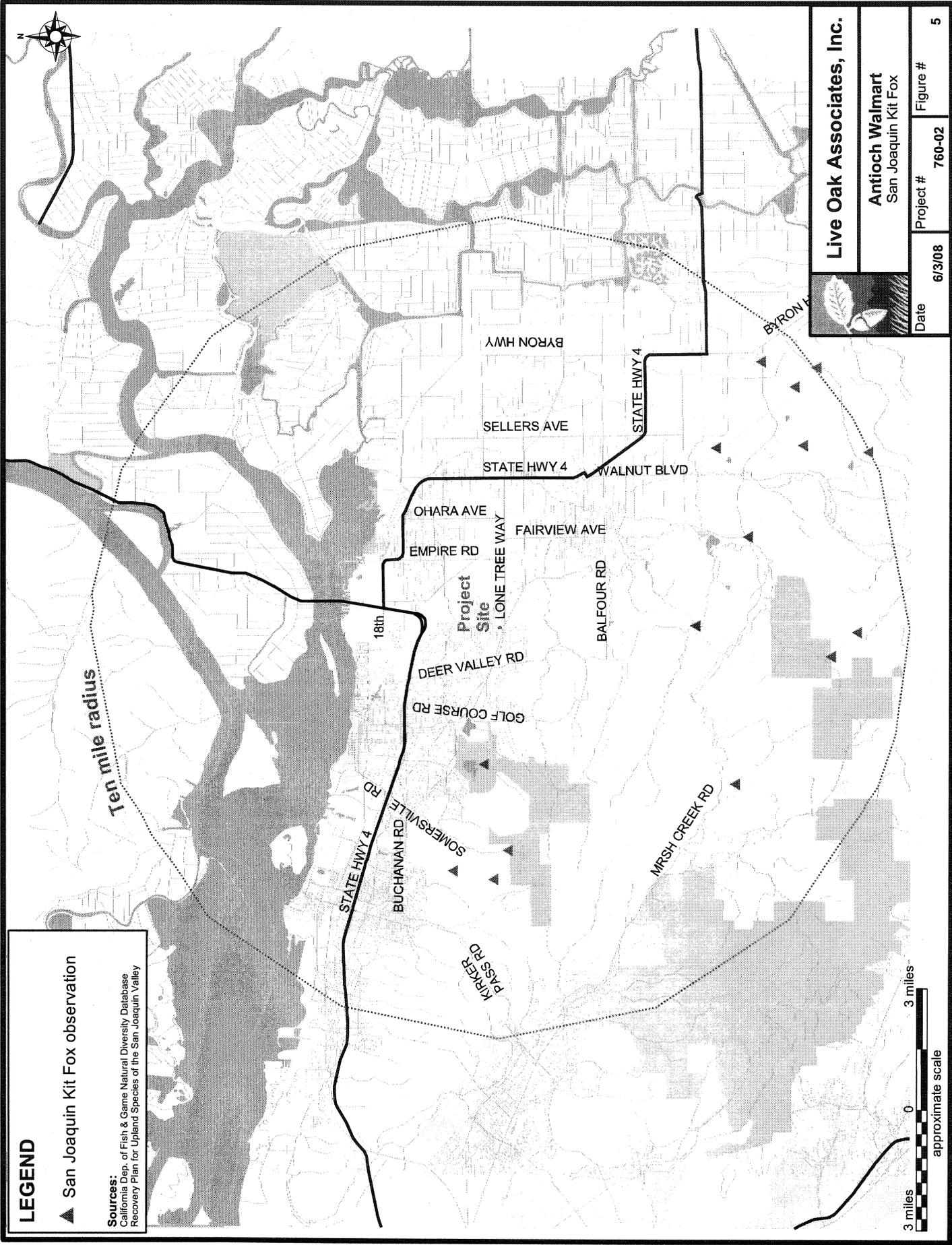


TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

PLANTS (adapted from CDFG 2008 and CNPS 2001)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	*Occurrence in the Study Area
Large-flowered Fiddleneck (<i>Amsinckia grandiflora</i>)	FE, CE, CNPS 1B	Cismontane woodland, valley and foothill grassland, at elevations between 275 and 305 meters. Blooms April-May.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated. Also, this species typically occurs at higher elevations.
Soft Bird's-beak (<i>Cordylanthus mollis</i> ssp. <i>mollis</i>)	FE, CR, CNPS 1B	Coastal salt marshes and swamps, at elevations between 0 and 3 meters. Blooms July-November.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at lower elevations.
Contra Costa Wallflower (<i>Erysimum capitatum</i> ssp. <i>angustatum</i>)	FE, CE, CNPS 1B	Inland dunes, at elevations between 3 and 20 meters. Blooms March-July.	Absent. Suitable habitat is absent from the site.
Contra Costa Goldfields (<i>Lasthenia conjugens</i>)	FE, CNPS 1B	Vernal pools and mesic areas of valley and foothill grasslands, typically alkaline, at elevations between 0 and 470 meters. Blooms March-June.	Absent. Suitable habitats are absent from the site. Originally the site was characterized by hummocky terrain; however, the site has been modified in a way that precludes the establishment of wetlands.
Antioch Dunes Evening-primrose (<i>Oenothera deltooides</i> ssp. <i>howellii</i>)	FE, CE	Inland dunes at elevations between 0 and 30 meters. Blooms March-September.	Absent. Suitable habitat is absent from the site.

Other special status plants listed by CNPS

Species	Status	Habitat	*Occurrence in the Study Area
Slender Silver Moss (<i>Anomobryum julaceum</i>)	CNPS 2	A moss occurring in broadleaved upland forest and coniferous forests between 100 and 1,000 meters in elevation.	Absent. Suitable habitat is absent from the study area.
Mt. Diablo Manzanita (<i>Arctostaphylos auriculata</i>)	CNPS 1B	Sandstone substrates in chaparral, at elevations between 135 and 650 meters. Blooms January-March.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Contra Costa Manzanita (<i>Arctostaphylos manzanita</i> ssp. <i>laevigata</i>)	CNPS 1B	Occurs on rocky substrates in chaparral, at elevations between 500 and 1,100 meters. Blooms January-March.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Alkali Milk-vetch (<i>Astragalus tener</i> var. <i>tener</i>)	CNPS 1B	Alkaline soils within playas, valley and foothill grasslands and in vernal pools, at elevations between 1 and 60 meters. Blooms March-June.	Absent. The site is highly disturbed and dominated by non-native, invasive plant species. Therefore, the onsite grasslands are unsuitable for this species, and any wetland habitat that may have at one time occurred onsite has been eliminated.

* See last page of Table 1 for detailed footnote.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

Other special status plants listed by CNPS (cont.)

Species	Status	Habitat	*Occurrence in the Study Area
Heartscale (<i>Atriplex cordulata</i>)	CNPS 1B	Chenopod scrub, meadows and seeps, and sandy valley and foothill grasslands in alkaline soils between 1 and 375 meters. Blooms April-October.	Absent. The site is highly disturbed and dominated by non-native, invasive plant species. Therefore, the onsite grasslands are unsuitable for this species, and any wetland habitat that may have at one time occurred onsite has been eliminated.
Brittlescale (<i>Atriplex depressa</i>)	CNPS 1B	Alkaline wetland soils and valley and foothill grasslands, at elevations between 1 and 320 meters. Blooms May-October.	Absent. The site is highly disturbed and dominated by non-native, invasive plant species. Therefore, the onsite grasslands are unsuitable for this species, and any wetland habitat that may have at one time occurred onsite has been eliminated.
San Joaquin Spearscale (<i>Atriplex joaquiniana</i>)	CNPS 1B	Alkaline soils of chenopod scrub, mesic areas within grasslands, at elevations between 1 and 835 meters. Blooms April-October.	Absent. The site is highly disturbed and dominated by non-native, invasive plant species. Therefore, the onsite grasslands are unsuitable for this species, and any wetland habitat that may have at one time occurred onsite has been eliminated.
Big Tarplant (<i>Blepharizonia plumosa</i> ssp. <i>plumosa</i>)	CNPS 1B	Valley and foothill grasslands, at elevations between 30 and 505 meters. Blooms July-October.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Round-leaved Filaree (<i>California macrophylla</i>)	CNPS 1B	Cismontane woodland and clay soils of valley and foothill grassland, at elevations between 15 and 1,200 meters. Blooms March-May.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Mt. Diablo Fairy-lantern (<i>Calochortus pulchellus</i>)	CNPS 1B	Chaparral, woodlands, and grasslands, at elevations between 30 and 840 meters. Blooms April-June.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Butte County Morning-glory (<i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i>)	CNPS 1B	Chaparral and rocky soils of lower montane coniferous forests, occasionally along roadsides, at elevations between 600 and 1,524 meters in elevation.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Chaparral Harebell (<i>Campanula exigua</i>)	CNPS 1B	Rocky and occasionally serpentine soils of chaparral, at elevations between 275 and 1,250 meters. Blooms May-June.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Congdon's Tarplant (<i>Centromadia parryi</i> ssp. <i>congdonii</i>)	CNPS 1B	Valley and foothill grasslands, at elevations between 1 and 230 meters. Blooms May-November.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

Other special status plants listed by CNPS (cont.)

Species	Status	Habitat	*Occurrence in the Study Area
Mt. Diablo Bird's-beak (<i>Cordylanthus nidularius</i>)	CNPS 1B	Serpentine soils in chaparral, at elevations between 600 and 800 meters. Blooms July-August.	Absent. Suitable habitat is absent from the study area. Also, this species typically occurs at higher elevations.
Hoover's Cryptantha (<i>Cryptantha hooveri</i>)	CNPS 1B	Sandy soils of valley and foothill grasslands and inland dunes, at elevations between 3 and 150 meters. Blooms April-May.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Hospital Canyon Larkspur (<i>Delphinium californicum</i> ssp. <i>interius</i>)	CNPS 1B	Mesic areas within openings in chaparral and woodland, at elevations between 230 and 1,095 meters. Blooms April-June	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Recurved Larkspur (<i>Delphinium recurvatum</i>)	CNPS 1B	Alkaline soils in chenopod scrub, cismontane woodlands and valley and foothill grasslands, at elevations between 3 and 750 meters. Blooms March-June.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Norris' Beard Moss (<i>Didymodon norrisii</i>)	CNPS 2	Moss occurring in cismontane woodland and lower montane coniferous forest, at elevations between 600 and 1,973 meters.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Dwarf Downingia (<i>Downingia pusilla</i>)	CNPS 2	Mesic areas within valley and foothill grassland and in vernal pools, at elevations between 1 and 445 meters. Blooms March-May.	Absent. The site is highly disturbed and dominated by non-native, invasive plant species. Therefore, the onsite grasslands are unsuitable for this species, and any wetland habitat that may have at one time occurred onsite has been eliminated.
Brandege's Eriastrum (<i>Eriastrum brandegeae</i>)	CNPS 1B	Volcanic and sandy soils of chaparral and cismontane woodland, at elevations between 305 and 1,030 meters. Blooms April-August.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Mt. Diablo Buckwheat (<i>Eriogonum truncatum</i>)	CNPS 1A	Sandy substrates in chaparral, coastal scrub and grasslands, at elevations between 105 and 600 meters. Blooms April-December.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Diamond-petaled California Poppy (<i>Eschscholzia rhombipetala</i>)	CNPS 1B	Clay or alkaline soils in grasslands, at elevations between 0 and 975 meters. Blooms March-April.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Fragrant Fritillary (<i>Fritillaria liliacea</i>)	CNPS 1B	Coastal prairie, and scrub, and valley and foothill grasslands, often on serpentine, at elevations between 3 and 410 meters. Blooms February-April.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

Other special status plants listed by CNPS (cont.)

Species	Status	Habitat	*Occurrence in the Study Area
Diablo Helianthella (<i>Helianthella castanea</i>)	CNPS 1B	Broadleaved upland forest, woodlands, chaparral, coastal scrub and grassland, at elevations between 60 and 1300 meters. Blooms March-June.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Brewer's Western Flax (<i>Hesperolinon breweri</i>)	CNPS 1B	Coastal prairie, coastal scrub, and valley and foothill grasslands, often on serpentine soils, at elevations between 30 and 900 meters.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Wooly Rose-mallow (<i>Hibiscus lasiocarpus</i>)	CNPS 2	Freshwater marshes and swamps, at elevations between 0 and 120 meters. Blooms June-September.	Absent. Suitable habitat is absent from the site.
Carquinez Goldenbush (<i>Isocoma arguta</i>)	CNPS 1B	Alkaline soils within valley and foothill grasslands, at elevations between 1 and 20 meters. Blooms August-December.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Delta Tule Pea (<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>)	CNPS 1B	Marshes and swamps, at elevations between 0 and 4 meters. Blooms May-September.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at lower elevations.
Mason's Lilaepsis (<i>Lilaepsis masonii</i>)	CNPS 1B	Marshes, swamps and riparian scrub, at elevations between 0 and 10 meters. Blooms April-November.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at lower elevations.
Delta Mudwort (<i>Limosella subulata</i>)	CNPS 2	Marshes and swamps, at elevations between 0 and 3 meters. Blooms May-August.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at lower elevations.
Showy Madia (<i>Madia radiata</i>)	CNPS 1B	Cismontane woodlands and in grasslands, at elevations between 25 and 900 meters. Blooms March-May.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.
Hall's Bush Mallow (<i>Malacothamnus hallii</i>)	CNPS 1B	Chaparral and coastal scrub, at elevations between 10 and 760 meters. Blooms May-October.	Absent. Suitable habitat is absent from the site.
San Antonio Hills Monardella (<i>Monardella antonina</i> ssp. <i>antonina</i>)	CNPS 3	Chaparral and cismontane woodland, at elevations between 500 and 1,000 meters. Blooms June-August.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Colusa Grass (<i>Neostapfia colusana</i>)	CNPS 1B	Large vernal pools on adobe, at elevations between 5 and 200 meters. Blooms May-August.	Absent. Suitable habitat is absent from the site. Originally the site was characterized by hummocky terrain; however, the site has been modified in a way that precludes the establishment of wetlands.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

Other special status plants listed by CNPS (cont.)

Species	Status	Habitat	*Occurrence in the Study Area
Mt. Diablo Phacelia (<i>Phacelia phacelioides</i>)	CNPS 1B	Rocky substrates in chaparral and woodland, at elevations between 500 and 1,370 meters. Blooms April-May.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Bearded Popcorn-flower (<i>Plagiobothrys hystriculus</i>)	CNPS 1A	Mesic areas within grasslands and in vernal pools, at elevations between 10 and 50 meters. Blooms April-May.	Absent. The site is highly disturbed and dominated by non-native, invasive plant species. Therefore, the onsite grasslands are unsuitable for this species, and any wetland habitat that may have at one time occurred onsite has been eliminated.
Eel-grass Pondweed (<i>Potamogeton zosteriformis</i>)	CNPS 2	Marshes and swamps, at elevations below 1,860 meters. Blooms June-July.	Absent. Suitable habitat is absent from the site.
Rock Sanicle (<i>Sanicula saxatilis</i>)	CNPS 1B, CR	Rocky substrates in broadleaved upland forest, chaparral and grassland, at elevations between 620 and 1175 meters. Blooms April-May.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Side-flowering Skullcap (<i>Scutellaria lateriflora</i>)	CNPS 2	Mesic meadows, seeps, marshes and swamps, at elevations between 0 and 500 meters. Blooms July-September.	Absent. Suitable habitat is absent from the site.
Chaparral Ragwort (<i>Senecio aphanactis</i>)	CNPS 2	Alkaline soils in chaparral, woodland and coastal scrub, at elevations between 15 and 800 meters. Blooms January-April.	Absent. Suitable habitat is absent from the site.
Most Beautiful Jewel-flower (<i>Streptanthus albidus</i> ssp. <i>peremeonus</i>)	CNPS 1B	Serpentine soils in chaparral, woodland and grassland, at elevations between 120 and 1000 meters. Blooms March-October.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Mt. Diablo Jewel-flower (<i>Streptanthus hispidus</i>)	CNPS 1B	Rocky substrates in chaparral and grassland, at elevations between 365 and 1200 meters. Blooms March-June.	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.
Coastal Triquetrella (<i>Triquetrella californica</i>)	CNPS 1B	Moss occurring in coastal bluff scrub and coastal bluff, at elevations between 10 and 100 meters.	Absent. Suitable habitat is absent from the site.
Caper-fruited Tropidocarpum (<i>Tropidocarpum capparideum</i>)	CNPS 1A	Alkaline soils in grassland, at elevations between 1 and 455 meters. Blooms March-April.	Absent. The grasslands of the site are highly disturbed and dominated by non-native, invasive plant species. Therefore, any suitable habitat that may have at one time occurred onsite has been eliminated.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

Other special status plants listed by CNPS (cont.)

Species	Status	Habitat	*Occurrence in the Study Area
Oval-leaved Viburnum (<i>Viburnum ellipticum</i>)	CNPS 2	Chaparral, woodland and lower montane coniferous forest, at elevations between 215 and 1,400 meters. Blooms May-June	Absent. Suitable habitat is absent from the site. Also, this species typically occurs at higher elevations.

ANIMALS (adapted from CDFG 2008 and USFWS 2008)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	*Occurrence in the Study Area
Longhorn Fairy Shrimp (<i>Branchinecta longiantenna</i>)	FE	Vernal pools clear to turbid water in grass-bottomed pools and clear water sandstone depression pools.	Absent. Suitable habitat (i.e. vernal pools) is absent from the site.
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	FT	Vernal pools, clear to tea-colored water in grass or mud-bottomed swales, basalt depression pools, or sandstone rock outcrops.	Absent. Suitable habitat (i.e. vernal pools) is absent from the site.
Vernal Pool Tadpole Shrimp (<i>Lepidurus packardii</i>)	FE	Primarily found in vernal pools, but may use other seasonal wetlands in mesic valley and foothill grasslands.	Absent. Suitable habitat (i.e. vernal pools) is absent from the site.
Lange's Metalmark Butterfly (<i>Apodemia mormo langei</i>)	FE	Inhabits stabilized dunes along the banks of the San Joaquin River. Endemic to the Antioch Dunes area.	Absent. Suitable habitat is presently and historically absent from the site.
California Tiger Salamander (<i>Ambystoma californiense</i>)	FT, CSC	Breeds in vernal pools and stock ponds of central California; adults aestivate in grassland habitats adjacent to the breeding sites.	Absent. Suitable breeding habitat for this species in the form of stagnant pools with continuous inundation for a minimum of three months is absent from the site and the immediate vicinity; thereby precluding the salamander from occurring onsite.
California Red-legged Frog (<i>Rana aurora draytonii</i>)	FT, CSC	Rivers, creeks and stock ponds of the Sierra foothills and Bay Area, preferring pools with overhanging vegetation.	Absent. Suitable habitat is absent from the site and its immediate vicinity. The site itself consists entirely of upland habitat, and East Antioch Creek, located immediately north of the site, does not provide suitable habitat for this species.
Alameda Whipsnake (<i>Masticophis lateralis euryxanthus</i>)	FT, CT	Closely associated with chaparral and rock outcrops.	Absent. Suitable habitat is absent from the site.
Giant Garter Snake (<i>Thamnophis gigas</i>)	FT, CT	Prefers freshwater marsh and low gradient streams, however, species has adapted to drainage canals and irrigation ditches.	Absent. Suitable habitat is absent from the site and its immediate vicinity. The site itself consists entirely of upland habitat, and East Antioch Creek, located immediately north of the site, does not provide suitable habitat for this species.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act (cont.)

Species	Status	Habitat	*Occurrence in the Study Area
Swainson's Hawk (<i>Buteo swainsoni</i>)	CT	A summer migrant in grasslands and agricultural lands of California's Central Valley. Breeds in juniper-sage flats, riparian areas and in oak savannahs.	Unlikely. Suitable nesting habitat is absent, and the site provides only marginal foraging habitat.
Willow Flycatcher (<i>Empidonax trailii</i>)	FE, CE (while nesting)	Breeds in the Sierra Nevada mountains and in Southern California.	Absent. Uncommon migrant; this species would not breed on the site, and individuals that may pass through the site are most likely not of the federally listed subspecies.
Bank Swallow (<i>Riparia riparia</i>)	CT	Colonial nester on sandy banks near streams, rivers, lakes or coastal areas.	Absent. Suitable habitat is absent from the site.
San Joaquin Kit Fox (<i>Vulpes macrotis mutica</i>)	FE, CT	Desert alkali scrub and non-native grassland, may forage in adjacent agricultural habitats.	Absent. While the species is known to occur in the vicinity of Antioch, the site is highly disturbed and isolated from other potential fox habitat by development.

State Species of Special Concern and Protected Species

Species	Status	Habitat	*Occurrence in the Study Area
Western Pond Turtle (<i>Actinemys marmorata</i>)	CSC	Open slow-moving water of rivers and creeks of central California with rocks and logs for basking.	Unlikely. East Antioch Creek, located immediately north of the site, provides marginal habitat for this species. However, it is highly unlikely that an individual, if present in the creek, would climb the bank of the creek into the disturbed upland habitat of the site.
Coast Horned Lizard (<i>Phrynosoma coronatum</i>)	CSC	Prefers open areas with sandy or loose soils for burying itself and shrubs for cover.	Absent. Suitable habitat (i.e. sandy soils and shrub cover) is absent from the site.
Silvery Legless Lizard (<i>Anniella pulchra pulchra</i>)	CSC	Prefers very moist soils in sandy or loamy areas with sparse vegetation cover.	Absent. Suitable habitat is absent due to the highly disturbed nature of the site.
San Joaquin Whipsnake (<i>Masticophis flagellum ruddocki</i>)	CSC	Prefers open, dry grasslands with no tree cover and animal burrows for refuge and egg-laying.	Absent. Suitable habitat is absent due to the highly disturbed nature of the site.
Golden Eagle (<i>Aquila chrysaetos</i>)	CP	Typically frequents rolling foothills, mountain areas, sage-juniper flats and desert.	Unlikely. Suitable nesting habitat is absent, and the site provides only marginal foraging habitat.
Northern Harrier (<i>Circus cyaneus</i>)	CSC	Frequents meadows, grasslands, open rangelands, freshwater emergent wetlands; uncommon in wooded habitats.	Unlikely. Suitable nesting habitat is absent, and the site provides only marginal foraging habitat.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

State Species of Special Concern and Protected Species (cont.)

Species	Status	Habitat	*Occurrence in the Study Area
White-tailed Kite (<i>Elanus leucurus</i>)	CP	Open grasslands and agricultural areas throughout central California.	Possible. Suitable breeding habitat is absent, but this species may occasionally forage in the onsite grasslands.
Burrowing Owl (<i>Athene cunicularia</i>)	CSC	Found in open, dry grasslands, deserts and ruderal areas. Requires suitable burrows. This species is often associated with California ground squirrels.	Present. Two adult burrowing owls were observed utilizing a ground squirrel burrow during the May 2008 survey. A suitable prey base in the form of ground squirrels was also observed onsite. Therefore, suitable breeding and foraging habitat is present.
Short-eared Owl (<i>Asio flammeus</i>)	CSC	Nests in tall grasses or in tules within swamps and irrigated agricultural fields.	Unlikely. Suitable nesting habitat is absent, and the site provides only marginal foraging habitat.
Vaux's Swift (<i>Chaetura vauxi</i>)	CSC	Migrants and transients move through the foothills of the western Sierra in spring and late summer. Breeds in coniferous forests.	Unlikely. Suitable nesting habitat is absent, and the site provides only marginal foraging habitat.
Black Swift (<i>Cypseloides niger</i>)	CSC	Migrants and transients found throughout many habitats of state. Breed on steep cliffs or ocean bluffs, or in cracks and crevasses of inland deep canyons.	Unlikely. Suitable nesting habitat is absent, and the site provides only marginal foraging habitat.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	CSC	Nests in tall shrubs and dense trees, forages in grasslands, marshes, and ruderal habitats.	Possible. Suitable breeding habitat is marginal to absent, but this species may occasionally forage in the onsite grasslands.
Tricolored blackbird (<i>Agelaius tricolor</i>)	CSC	Breeds near fresh water in dense emergent vegetation.	Unlikely. Suitable nesting habitat is absent, and the site provides only marginal foraging habitat.
Pallid Bat (<i>Antrozous pallidus</i>)	CSC	Grasslands, chaparral, woodlands, and forests, most common in dry rocky open areas providing roosting opportunities.	Unlikely. The site provides marginal foraging habitat for this species, although roosting habitat is absent.
California Mastiff Bat (<i>Eumops perotis californicus</i>)	CSC	Forages over many habitats, requires tall cliffs or buildings for roosting.	Unlikely. The site provides marginal foraging habitat for this species, although roosting habitat is absent.
Townsend's Big-eared Bat (<i>Plecotus townsendii townsendii</i>)	CSC	Primarily a cave-dwelling bat, but may also roost in buildings. Occurs in a variety of habitats.	Unlikely. The site provides marginal foraging habitat for this species, although roosting habitat is absent.
Western Red Bat (<i>Lasiurus blossevillii</i>)	CSC	Occurs in canyon habitats along streams.	Unlikely. The site provides marginal foraging habitat for this species, although roosting habitat is absent.
Ringtail (<i>Bassariscus astutus</i>)	CP	Occurs in riparian and heavily wooded habitats near water.	Absent. Suitable habitat is absent from the site.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

State Species of Special Concern (cont.)

Species	Status	Habitat	*Occurrence in the Study Area
American Badger (<i>Taxidea taxus</i>)	CSC	Found in drier open stages of most shrub, forest and herbaceous habitats with friable soils.	Absent. Suitable habitat is absent from the site.

***Explanation of Occurrence Designations and Status Codes**

Present: Species observed on the sites at time of field surveys or during recent past.
Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the sites, but it could occur there from time to time.
Unlikely: Species not observed on the sites, and would not be expected to occur there except, perhaps, as a transient.
Absent: Species not observed on the sites, and precluded from occurring there because habitat requirements not met.

STATUS CODES

- | | | | |
|------|---|-----|---|
| FE | Federally Endangered | CE | California Endangered |
| FT | Federally Threatened | CT | California Threatened |
| FPE | Federally Endangered (Proposed) | CR | California Rare |
| FC | Federal Candidate | CP | California Protected |
| | | CSC | California Species of Special Concern |
| CNPS | California Native Plant Society Listing | | |
| 1A | Plants Presumed Extinct in California | 3 | Plants about which we need more information – a review list |
| 1B | Plants Rare, Threatened, or Endangered in California and elsewhere | 4 | Plants of limited distribution – a watch list |
| 2 | Plants Rare, Threatened, or Endangered in California, but more common elsewhere | | |

2.4 JURISDICTIONAL WATERS

Jurisdictional waters include rivers, creeks, and drainages that have a defined bed and bank and which, at the very least, carry ephemeral flows. Jurisdictional waters also include lakes, ponds, reservoirs, and wetlands. Such waters may be subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Game (CDFG), and the California Regional Water Quality Control Board (RWQCB). See Section 3.2.4 of this report for additional information.

Jurisdictional waters are absent from the site itself. However, East Antioch Creek immediately north of the site may be considered a jurisdictional waterway. Therefore, if the project were to be redesigned in such a way that the Creek were to be impacted, the applicant may be required to consult with the appropriate governing agencies.

Although jurisdictional waters are presumed to be absent, the agencies are the final arbiters and could claim jurisdiction over any aquatic resources they determine as present on the site.

3.0 IMPACTS AND MITIGATIONS

3.1 SIGNIFICANCE CRITERIA

Approval of general plans, area plans, and specific projects is subject to the provisions of the California Environmental Quality Act (CEQA). The purpose of CEQA is to assess the impacts of proposed projects on the environment before they are carried out. CEQA is concerned with the significance of a proposed project's impacts. For example, a proposed development project may require the removal of some or all of a site's existing vegetation. Animals associated with this vegetation could be destroyed or displaced. Animals adapted to humans, roads, buildings, pets, etc., may replace those species formerly occurring on the site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed.

Whenever possible, public agencies are required to avoid or minimize environmental impacts by implementing practical alternatives or mitigation measures. According to Section 15382 of the CEQA Guidelines, a significant effect on the environment means a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest."

Specific project impacts to biological resources may be considered "significant" if they would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal

pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Furthermore, CEQA Guidelines Section 15065(a) states that a project may trigger the requirement to make a “mandatory findings of significance” if the project has the potential to:

“Substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory.”

3.2 RELEVANT GOALS, POLICIES, AND LAWS

3.2.1 Threatened and Endangered Species

State and federal “endangered species” legislation has provided the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal Endangered Species Acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as “species of special status.” Permits may be required from both the CDFG and USFWS if activities associated with a planned project will result in the take of a listed species. “Take” is defined by the state of California as “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill” (California Fish and Game Code, Section 86). “Take” is more broadly defined by the federal Endangered Species Act to include “harm”

(16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFG and the USFWS are responding agencies under the California Environmental Quality Act (CEQA). Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

3.2.2 Migratory Birds

State and federal laws also protect most bird species. The Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

3.2.3 Birds of Prey

Birds of prey are protected in California under provisions of the State Fish and Game Code, Section 3503.5, (1992), which states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto”. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “taking” by the CDFG.

3.2.4 Wetlands and Other “Jurisdictional Waters”

Natural drainage channels and adjacent wetlands may be considered “Waters of the United States” (hereafter referred to as “jurisdictional waters”) subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE). The extent of jurisdiction has been defined in the Code of Federal Regulations but has also been subject to interpretation of the federal courts. Jurisdictional waters generally include:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

- All interstate waters including interstate wetlands:
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce;
- All impoundments of waters otherwise defined as waters of the United States under the definition;
- Tributaries of waters identified in paragraphs (a)(1)-(4) (i.e. the bulleted items above).

As recently determined by the United States Supreme Court in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (the SWANCC decision), channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. However, the U.S Supreme Court decisions *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers* (referred together as the Rapanos decision) impose a "significant nexus" test for federal jurisdiction over wetlands. In June 2007, the USACE and Environmental Protection Agency (EPA) established guidelines for applying the significant nexus standard. This standard includes 1) a case-by-case analysis of the flow characteristics and functions of the tributary or wetland to determine if they significantly affect the chemical, physical, and biological integrity of downstream navigable waters and 2) consideration of hydrologic and ecologic factors (EPA and USACE 2007).

The USACE regulates the filling or grading of such waters under the authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by “ordinary high water marks” on opposing channel banks. Wetlands are habitats with soils that are intermittently or permanently saturated, or inundated. The resulting anaerobic conditions select for plant species known as hydrophytes that show a high degree of fidelity to such soils. Wetlands are identified by the presence of hydrophytic vegetation, hydric soils (soils saturated intermittently or permanently saturated by water), and wetland hydrology according to methodologies outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987).

All activities that involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the USACE (Wetland Training Institute, Inc. 1991). Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the Regional Water Quality Control Board (RWQCB) issues a certification (or waiver of such certification) that the proposed activity will meet state water quality standards. The filling of isolated wetlands, over which the USACE has disclaimed jurisdiction under the SWANCC decision, is regulated by the RWQCB. It is unlawful to fill isolated wetlands without filing a Notice of Intent with the RWQCB. The RWQCB is also responsible for enforcing National Pollution Discharge Elimination System (NPDES) permits, including the General Construction Activity Storm Water Permit. All projects requiring federal money must also comply with Executive Order 11990 (Protection of Wetlands).

The California Department of Fish and Game has jurisdiction over the bed and bank of natural drainages according to provisions of Section 1601 and 1602 of the California Fish and Game Code (2003). Activities that would disturb these drainages are regulated by the CDFG via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protect the habitat values of the drainage in question.

3.3 CONSTRAINTS SPECIFIC TO THE PROJECT SITE

The planned project consists of the expansion of an existing Wal-Mart site in southern Antioch. This expansion would result in the conversion of the 3.7-acre study area into development (i.e., a portion of the expanded Wal-Mart building and additional concrete-paved parking). Grading will be required to accommodate this new development and, as a result, the ruderal non-native grassland habitat occurring on the site will be disturbed or destroyed within the planned footprint of the future construction zones. Secondary impacts to areas outside of construction zones could occur as well and may include gully erosion as a result of cut-and-fill grading and the sedimentation of natural drainages. As discussed above, activities resulting in impacts to biotic resources may be regulated by local, state and federal laws. The natural resource issues specific to this project are discussed in detail below.

3.3.1 Loss of Habitat for Special Status Plants

Potential Impact. There are 50 special status vascular plant species known to occur in the general project vicinity (Table 1). Site development would have no effect on regional populations of these species since the site provides no habitat for special status plants. Therefore, state and federal laws protecting special status plants would not be relevant to development of the site.

Mitigation. Mitigation measures are not warranted.

3.3.2 Loss of Habitat for Special Status Animals

Potential Impact. Thirty-one special status animal species occur, or once occurred, regionally (Table 1). Of those, 28 would be absent or unlikely to occur on the site due to unsuitable habitat conditions. These include the state and/or federally listed longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Lange's metalmark butterfly, California tiger salamander, California red-legged frog, Alameda whipsnake, giant garter snake, Swainson's hawk, willow flycatcher, bank swallow, and San Joaquin kit fox, as well as the western pond turtle, coast horned lizard, silvery legless lizard, San Joaquin whipsnake, golden eagle, northern harrier, short-eared owl, Vaux's swift, Black swift, tricolored blackbird, pallid bat, California mastiff bat, Townsend's big-eared bat, western red bat, ringtail, and American badger. Eventual project build-out would have no effect on these species because there is little or no likelihood that they are present.

Species that might rarely or occasionally occur in the study area as transients, occasional foragers, or winter migrants include the white-tailed kite and the loggerhead shrike. The site does not provide regionally important foraging habitat for these species. The ruderal grassland habitat of the study area is regionally abundant and will continue to be available regionally for these species following development. Migrant and transient species pass through or over many types of habitats en route to breeding or wintering habitat. Therefore, the loss of this habitat for these species would be considered less-than-significant.

The remaining special status animal species, the burrowing owl, is currently present onsite. Mitigation measures for the loss of habitat for this species are not warranted at this time due to

the fact that project proponents have preemptively purchased off-site acreage of mitigation habitat to offset this loss of habitat. This mitigation was apparently completed in 1999 in conjunction with mitigation for the Williamson Ranch Plaza following discussions with the City of Antioch and the CDFG. Potential impacts to and mitigations for those impacts to individuals of this species is dealt with specifically below (Section 3.3.3).

Mitigation. Mitigation measures are not warranted.

3.3.3 Disturbance to Active Raptor Nests from Construction Activities during Project Implementation

Potential Impacts. Suitable habitat for tree nesting raptors is absent from the site at this time. There are a few immature trees along the boundaries of the site; however, these trees are too small to support raptor nests. Nonetheless, suitable habitat, in the form of ground squirrel burrows, is present onsite for the burrowing owl. While a protocol-level burrowing owl survey conducted on the study area in 2005 concluded that owls were absent from the site, they have since colonized the study area. During the May 2008 survey, a pair of burrowing owls was observed within the study area.

As discussed in Section 3.3.2, mitigation measures to offset the loss of burrowing owl habitat resulting from future site development are not warranted. However, precautionary measures would be required to ensure that individuals were not harmed, injured, or killed. Future construction activities that would adversely affect burrowing owl nesting activity or result in the mortality of individual birds constitute a violation of federal and state laws (see discussion in Section 3.2.3) and are considered significant adverse impacts. Therefore, the following mitigation would be required prior to any ground disturbance.

Mitigation. To avoid potential “take” of burrowing owls, the project applicant shall retain a qualified biologist to conduct protocol-level surveys within 30 days of scheduled ground disturbance in order to ensure that owls are absent from the site. Depending upon the outcome of the surveys, one of the following measures will be implemented.

- ❖ If these surveys demonstrate that owls are absent, then ground disturbance may proceed without any impediment.

- ❖ If nesting burrowing owls are detected on site prior to ground disturbance, then the applicant shall establish a 250-foot construction free buffer around the active nest, with the perimeter of the buffer zone clearly delineated by flagged survey stakes or construction fencing. No equipment or activity shall be allowed within the buffer zone until the owls have either vacated the nest (e.g., due to nest failure) or the young have fledged (usually no later than mid-September), as determined by a qualified biologist. Additionally, the applicant shall inform both the City of Antioch and the California Department of Fish and Game (CDFG) of the presence of the owl(s) and the establishment of the buffer.

- ❖ If non-nesting burrowing owls are detected on site prior to ground disturbance, the applicant may proceed with grading provided that the standard measures to passively relocate the owls are implemented by a qualified biologist. The applicant shall inform CDFG of their intent to passively relocate non-nesting owls and then a qualified biologist shall place one-way doors in all potential burrows on site. These doors shall remain in place for three days and be inspected daily by a qualified biologist. In the event that new burrows of suitable size for burrowing owls are created after the placement of the one-way doors, additional doors shall be installed in these newly constructed burrows and shall remain in place for a minimum of three days. Burrows may be collapsed after three days upon a determination by a qualified biologist that they are absent of owls.

Implementation of the above measures will fully mitigate impacts to burrowing owls.

3.3.4 Loss of Habitat for Native Wildlife

Potential Impact. The planned project will result in the loss of approximately 3.7 acres of ruderal non-native grassland habitat, which is surrounded by development and isolated from naturally occurring biotic habitats. The study area likely comprises a portion of some locally occurring wildlife species' home range or territory. As such, some species may disperse through the study area, but most wildlife presently using the study area do so as part of their normal movements for foraging, mating, and caring for young. Individuals of the various vertebrate species presently occupying the site would be displaced or lost from the development area.

While the site provides habitat for several native wildlife species, ruderal non-native grassland habitat is relatively common in the region. Therefore, aside from potential impacts already identified for burrowing owls (Sections 3.3.2 and 3.3.3), the loss of habitats for native wildlife resulting from the planned project are considered less-than-significant.

Mitigation. Mitigation measures are not warranted.

3.3.5 Interference with the Movement of Native Wildlife

Potential Impact. One must differentiate between animals' consistent use patterns in order to assess the importance of an area as a "movement corridor." Wildlife movements generally can be divided into three major behavioral categories:

- Movements within a home range or territory;
- Movements during migration; and
- Movements during dispersal.

While no detailed study of animal movements has been conducted for the study area, knowledge of the site, its habitats, and the ecology of the species occurring onsite permits sufficient predictions about the types of movements occurring in the region and whether or not planned development would constitute a significant impact to animal movements.

The site planned for development consists of ruderal non-native grassland habitat, which is surrounded by development and therefore isolated from naturally occurring biotic habitats. East Antioch Creek immediately north of the site would constitute a minor movement corridor; however, this Creek would not be considered a significant movement corridor for any locally occurring wildlife. As such, the habitat of the site is not expected to function as a major movement corridor between areas of natural habitat for most native species. Certain bird species may use this habitat for foraging during fall or spring migration, but aside from this, movements of native wildlife on the site would mainly be confined to those of resident animals moving within the site itself.

Mitigation. Project impacts to wildlife movements would be less-than-significant, and no mitigation measures are warranted.

3.3.6 Disturbance to Waters of the U.S. or Riparian Habitats

Potential Impact. Waters of the U.S. and riparian habitats are absent from the project site. The site itself consists completely of upland habitat. East Antioch Creek, a potentially jurisdictional water, runs adjacent to the northern boundary of the site. Protective measure will need to be taken during and after project build-out to ensure the existing quality of the Creek is not degraded (Section 3.3.7).

Mitigation. As long as construction occurs outside of East Antioch Creek, jurisdictional waters and/or riparian habitats will not be impacted by the project and, therefore, no mitigation is required.

3.3.7 Degradation of Water Quality in Seasonal Drainages, Stock Ponds and Downstream Waters

Potential Impact. Eventual site development may require grading that leaves the soil of construction zones barren of vegetation and, therefore, vulnerable to sheet, rill, or gully erosion. Eroded soil is generally carried as sediment in surface runoff to be deposited in natural creek beds, canals, and adjacent wetlands. Furthermore, urban runoff is often polluted with grease, oil, pesticide and herbicide residues, heavy metals, etc. These pollutants may eventually be carried to sensitive wetland habitats used by a diversity of native wildlife species. The deposition of pollutants and sediments in sensitive wetland habitats would be considered a potentially significant adverse environmental impact.

Mitigation. The applicant must comply with the provisions of a City grading permit, including standard erosion control measures that employ best management practices (BMPs). Such compliance will result in no impact to water quality in seasonal creeks, reservoirs, and downstream waters from the planned project.

3.3.8 Local Policies or Ordinances Protecting Biological Resources

Impacts. The City of Antioch has adopted a number of general plan policies related to the protection of wetland, native biotic habitats, native vegetation, and wetlands (LSA 2003;

Appendix C). Projects within the City are supposed to be in compliance with these policies, wherever possible. The City also has an established Municipal Code, including a tree preservation policy. However, it is not expected that any of the Municipal Code policies would apply to this project. Therefore, the only local policies or ordinances that would need to be implemented prior to project build-out are those from the General Plan (Appendix C).

Mitigation. The project will need to be in compliance with the City of Antioch's General Plan Policies for the protection of biotic resources.

3.3.9 Confliction with Provisions of an Adopted Conservation Plan

Potential Impact. An adopted or a Draft Habitat Conservation Plan does not currently exist for the Antioch area. Therefore, this significance criterion does not apply.

Mitigation. Mitigation measures are not warranted at this time.

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APPENDIX A
VASCULAR PLANTS OF THE STUDY AREA

The plant species listed below have been observed on the Antioch Wal-Mart study area during the surveys conducted by Live Oak Associates in April 2005 and/or May 2008. All plants have been named according to *The Jepson Manual* (Hickman 1993). The U.S. Fish and Wildlife Service indicator status of each plant has been shown following its common name.

OBL - Obligate
 FACW - Facultative Wetland
 FAC - Facultative
 FACU - Facultative Upland
 UPL - Upland
 +/- - Higher/lower end of category
 NR - No review
 NA - No agreement
 NI - No investigation

ASTERACEAE - Sunflower Family

<i>Carduus pycnocephalus</i>	Italian Thistle	UPL
<i>Centauria solstitialis</i>	Yellow Star Thistle	UPL
<i>Picris echioides</i>	Bristly Ox Tongue	FAC*
<i>Sonchus asper</i>	Prickly Sow Thistle	FAC-

BRASSICACEAE – Mustard Family

<i>Brassica nigra</i>	Black Mustard	UPL
<i>Raphanus sativus</i>	Wild Radish	UPL
<i>Sisymbrium irio</i>	London Rocket	UPL

FABACEAE – Legume Family

<i>Vicia sativa</i>	Spring Vetch	FACU
<i>Vicia villosa</i>	Hairy Vetch	FACU
<i>Medicago polymorpha</i>	Bur Clover	UPL
<i>Lupinus bicolor</i>	Miniature Lupine	UPL
<i>Lupinus succulentus</i>	Succulent Lupine	UPL
<i>Trifolium hirtum</i>	Rose Clover	UPL

GERANIACEAE – Geranium Family

<i>Erodium cicutarium</i>	Red-stemmed Filaree	UPL
<i>Geranium</i> sp.	Geranium	-

POACEAE - Grass Family

<i>Avena barbata</i>	Slender Wild Oats	UPL
<i>Bromus diandrus</i>	Ripgut	UPL
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	Barnyard Barley	NI
<i>Lolium multiflorum</i>	Italian Ryegrass	UPL

POLYGONACEAE - Buckwheat Family

<i>Rumex crispus</i>	Curly Dock	FACW
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ROSACEAE – Rose Family

<i>Photinia glabra</i>	Red-leaf Photinia	UPL
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SALICACEAE – Willow Family

<i>Salix</i> sp.	Willow	-
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SCROPHULARIACEAE – Snapdragon Family

<i>Castilleja exserta</i>	Purple Owl's Clover	UPL
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**APPENDIX B
TERRESTRIAL VERTEBRATES THAT POTENTIALLY OCCUR
ON THE STUDY AREA**

Listed below are those species that may reasonably be expected to use the habitats of the project site routinely during some or all of the year. The list is not intended to include birds that are vagrants or occasional transients. Species observed during the May 2008 field survey has been noted with an asterisk.

CLASS REPTILIA (Reptiles)

ORDER SQUAMATA (Lizards and Snakes)

SUBORDER SAURIA (Lizards)

FAMILY PHRYNOSOMATIDAE

Western fence lizard *Sceloporus occidentalis*

FAMILY ANGUIDAE (Alligator Lizards and Relatives)

California alligator lizard *Elgaria multicarinata*

SUBORDER SERPENTES (Snakes)

FAMILY COLUBRIDAE (Colubrids)

Gopher snake *Pituophis catenifer*
Common kingsnake *Lampropeltis getula*

CLASS AVES (Birds)

ORDER CICONIIFORMES (Herons, Storks, Ibises and Relatives)

FAMILY ARDEIDAE (Herons and Bitterns)

Great Egret *Ardea alba*
Snowy Egret *Egretta thula*

FAMILY CATHARTIDAE (New World Vultures)

Turkey vulture *Cathartes aura*

ORDER FALCONIFORMES (Vultures, Hawks and Falcons)

FAMILY ACCIPITRIDAE (Hawks, Old World Vultures and Harriers)

White-tailed kite *Elanus leucurus*
Sharp-shinned hawk *Accipiter striatus*
Cooper's hawk *Accipiter cooperii*
Red-shouldered hawk *Buteo lineatus*
Red-tailed hawk *Buteo jamaicensis*

FAMILY FALCONIDAE (Caracaras and Falcons)

American kestrel *Falco sparverius*
Merlin *Falco columbarius*
Prairie falcon *Falco mexicanus*

ORDER GALLIFORMES (Magapodes, Curassows, Pheasants and Relatives)

FAMILY PHASIANIDAE (Quails, Pheasants and Relatives)

Ring-necked pheasant *Phasianus colchicus*

FAMILY ODONTOPHORIDAE (New World Quail)

California quail *Callipepla californica*

ORDER COLUMBIFORMES (Pigeons and Doves)

FAMILY COLUMBIDAE (Pigeons and Doves)

Rock dove *Columba livia*
Band-tailed pigeon *Columba fasciata*
*Mourning dove *Zenaida macroura*

ORDER STRIGIFORMES (Owls)

FAMILY TYTONIDAE (Barn Owls)	
Barn owl	<i>Tyto alba</i>
FAMILY STRIGIDAE (Typical Owls)	
Western screech owl	<i>Otus kennicottii</i>
Great horned owl	<i>Bubo virginianus</i>
*Burrowing owl	<i>Athene cunicularia</i>
ORDER APODIFORMES (Swifts and Hummingbirds)	
FAMILY TROCHILIDAE (Hummingbirds)	
Anna's hummingbird	<i>Calypte anna</i>
Allen's hummingbird	<i>Selasphorus sasin</i>
ORDER PASSERIFORMES (Perching Birds)	
FAMILY TYRANNIDAE (Tyrant Flycatchers)	
Black phoebe	<i>Sayornis nigricans</i>
Say's phoebe	<i>Sayornis saya</i>
FAMILY LANIIDAE (Shrikes)	
Loggerhead shrike	<i>Lanius ludovicianus</i>
FAMILY CORVIDAE (Jays, Magpies and Crows)	
Western scrub-jay	<i>Aphelocoma californica</i>
*American crow	<i>Corvus brachyrhynchos</i>
Common raven	<i>Corvus corax</i>
FAMILY HIRUNDINIDAE (Swallows)	
Tree swallow	<i>Tachycineta bicolor</i>
Violet-green swallow	<i>Tachycineta thalassina</i>
Bank swallow	<i>Riparia riparia</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
*Barn swallow	<i>Hirundo rustica</i>
FAMILY AEGITHALIDAE (Bushtit)	
Bushtit	<i>Psaltriparus minimus</i>
FAMILY TROGLODYTIDAE (Wrens)	
Bewick's wren	<i>Thryomanes bewickii</i>
House wren	<i>Troglodytes aedon</i>
Winter wren	<i>Troglodytes troglodytes</i>
FAMILY REGULIDAE (Kinglets)	
Ruby-crowned kinglet	<i>Regulus calendula</i>
FAMILY TURDIDAE (Thrushes)	
Western bluebird	<i>Sialia mexicana</i>
Hermit thrush	<i>Catharus guttatus</i>
American robin	<i>Turdus migratorius</i>
FAMILY MIMIDAE (Mockingbirds and Thrashers)	
*Northern mockingbird	<i>Mimus polyglottos</i>
California thrasher	<i>Toxostoma redivivum</i>
FAMILY STURNIDAE (Starlings and Allies)	
European starling	<i>Sturnus vulgaris</i>
FAMILY PARULIDAE (Wood Warblers and Relatives)	
Orange-crowned warbler	<i>Vermivora celata</i>
FAMILY EMBERIZIDAE (Emberizines)	
Spotted towhee	<i>Pipilo maculatus</i>
California towhee	<i>Pipilo crissalis</i>
Fox sparrow	<i>Passerella iliaca</i>
Song sparrow	<i>Melospiza melodia</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>

White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Golden-crowned sparrow	<i>Zonotrichia atricapilla</i>
Dark-eyed junco	<i>Junco hyemalis</i>
FAMILY CARDINALIDAE (Cardinals, Grosbeaks and Allies)	
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>
Lazuli bunting	<i>Passerina amoena</i>
FAMILY ICTERIDAE (Blackbirds, Orioles and Allies)	
Red-winged blackbird	<i>Gelaius phoeniceus</i>
Western meadowlark	<i>Sturnella neglecta</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Brown-headed cowbird	<i>Molothrus ater</i>
FAMILY FRINGILLIDAE (Finches)	
*House finch	<i>Carpodacus mexicanus</i>
Lesser goldfinch	<i>Carduelis psaltria</i>
American goldfinch	<i>Carduelis tristis</i>
FAMILY PASSERIDAE (Old World Sparrows)	
House sparrow	<i>Passer domesticus</i>
CLASS MAMMALIA (Mammals)	
ORDER DIDELPHIMORPHIA (Marsupials)	
FAMILY DIDELPHIDAE (Opossums)	
Virginia opossum	<i>Didelphis virginiana</i>
ORDER INSECTIVORA (Insectivores)	
FAMILY SORICIDAE (Shrews)	
Ornate shrew	<i>Sorex ornatus</i>
FAMILY TALPIDAE (Moles)	
Broad-footed mole	<i>Scapanus latimanus</i>
ORDER CHIROPTERA (Bats)	
FAMILY VESPERTILIONIDAE (Evening Bats)	
Little brown myotis	<i>Myotis lucifugus</i>
Yuma myotis	<i>Myotis yumanensis</i>
California myotis	<i>Myotis californicus</i>
Western pipistrelle	<i>Pipistrellus hesperus</i>
Big brown bat	<i>Eptesicus fuscus</i>
Western red bat	<i>Lasiurus blossevillii</i>
Hoary bat	<i>Lasiurus cinereus</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
Pallid bat	<i>Antrozous pallidus</i>
FAMILY MOLOSSIDAE (Free-tailed Bats)	
Western mastiff bat	<i>Eumops perotis</i>
ORDER LAGOMORPHA (Rabbits, Hares and Pika)	
FAMILY LEPORIDAE (Rabbits and Hares)	
Brush rabbit	<i>Sylvilagus bachmani</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
ORDER RODENTIA (Rodents)	
FAMILY SCIURIDAE (Squirrels, Chipmunks and Marmots)	
*California ground squirrel	<i>Spermophilus beecheyi</i>
Western gray squirrel	<i>Sciurus griseus</i>

FAMILY GEOMYIDAE (Pocket Gophers)	
Botta's pocket gopher	<i>Thomomys bottae</i>
FAMILY HETEROMYIDAE (Pocket Mice and Kangaroo Rats)	
California pocket mouse	<i>Chaetodipus californicus</i>
FAMILY MURIDAE (Mice, Rats and Voles)	
Western harvest mouse	<i>Reithrodontomys megalotis</i>
California mouse	<i>Peromyscus californicus</i>
Deer mouse	<i>Peromyscus maniculatus</i>
California vole	<i>Microtus californicus</i>
ORDER CARNIVORA (Carnivores)	
FAMILY CANIDAE (Foxes, Wolves, and Relatives)	
Coyote	<i>Canis latrans</i>
Red Fox	<i>Vulpes vulpes</i>
FAMILY PROCYONIDAE (Raccoons and Relatives)	
Raccoon	<i>Procyon lotor</i>
FAMILY MEPHITIDAE (Skunks)	
Western spotted skunk	<i>Spilogale gracilis</i>
Striped skunk	<i>Mephitis mephitis</i>
FAMILY FELIDAE (Cats)	
Feral cat	<i>Felis catus</i>
Bobcat	<i>Lynx rufus</i>

**APPENDIX C
GENERAL PLAN POLICIES
RELATED TO NATURAL RESOURCES PROTECTION
CITY OF ANTIOCH**

- A significant ridgeline, hilltop, or exposed slope is located in the area.

The purpose of the Ordinance is to promote a more harmonious visual and functional relationship between the natural and built environments. The HPD Districts are reserved for residential uses that are clustered in a manner that will preserve significant features of hillside areas, such as drainage swales, streams, steep slopes, ridgelines, rock outcroppings, and native vegetation.

As of 1998, the City had three HPD Districts located in the south and southwest portions of the City. This land could be developed or redeveloped at any time with uses as specified in the General Plan or Zoning Ordinance. Areas designated, currently or in the future, as HPD Districts will be developed and should not be considered permanent passive open space. However, these areas will be developed in a manner which preserves valued open space characteristics.

10.3.1 Open Space Objective

Maintain, preserve and acquire open space and its associated natural resources by providing parks for active and passive recreation, trails, and by preserving natural, scenic, and other open space resources.

10.3.2 Open Space Policies

- Establish a comprehensive system of open space, facilities for organized recreation; active informal play; recreational travel along formal, natural, and riverfront trails; passive recreation; and enjoyment of the natural environment.
- Implement the design standards of the Community Image and Design Element so as to maintain views of the San Joaquin River, Mount Diablo and its foothills, and other scenic features, and protect the natural character of Antioch's hillside areas.
- Maintain the shoreline of the San Joaquin River as an integrated system of natural (wetlands) and recreational (trails and viewpoints) open space as set forth in the

Land Use Element and Public Services and Facilities Element.

- Where significant natural features are present (e.g., ridgelines, natural creeks), require new development to incorporate natural open space areas into project design. Require dedication to a public agency or dedication of a conservation easement, preparation of maintenance plans, and provision of appropriate maintenance in perpetuity of such open space areas.
- Require proposed development projects containing significant natural resources (e.g. sensitive habitats, habitat linkages, steep slopes, cultural resources, wildland fire hazards, etc.) to prepare Resource Management Plans to define appropriate responses to General Plan policies calling for their protection or preservation. Resource Management Plans shall accomplish the following.
 - Identify the significance of the resources that are found onsite and their relationship to resources in the surrounding area;
 - Define areas that are to be maintained in long-term open space, and
 - Establish mechanisms to ensure the long term protection and management of lands retained in open space.
- Encourage public access to creek corridors through the establishment of trails adjacent to riparian resources.
- Where feasible, incorporate significant existing natural features into the design of new development projects rather than removing them. Where preservation of natural features is not feasible, encourage the re-introduction of natural elements into project design.

10.4 BIOLOGICAL RESOURCES OBJECTIVE AND POLICIES

Although it is largely urbanized, portions of remaining undeveloped lands contain vegetation and habitat types the California Department of Fish and Game considers rare

and worthy of consideration in the California Natural Diversity Database:

- Native grasslands
- Vernal pools
- Stabilized interior dunes
- Seasonal wetlands
- Freshwater seeps
- Freshwater marshes
- Coastal brackish marshes
- Alkaline floodplains
- Alkali seeps
- Valley oak woodlands
- Riparian woodland

Grassland. Native grasslands have been reduced to 90 percent of their former area in California. Native grassland in the Antioch Planning Area would be dominated by purple needlegrass (*Nassella puchra*). A variety of spring wildflowers are also found in native grasslands. Because of the rarity of this once abundant vegetation type, the California Department of Fish and Game may request mitigation for projects that impact native grasslands. Additionally, special-status plants are more likely to be found in undisturbed native vegetation. Native grasslands are most likely to be found scattered in the southern part of the Antioch Planning Area.

Vernal Pools. Vernal pools are seasonal wetlands typically occurring in depressions in grasslands. These depressions collect water during the winter and spring rains, and dry once the rains cease. As the ponds dry in the spring, a succession of different plant species bloom around the edges of the pool. A high-quality vernal pool will display concentric rings of different colors of flowers in bloom in mid-spring. Because vernal pools tend to be isolated from each other, they may possess a unique flora that includes special-status, federally protected plants and special-status animals. Vernal pools are most likely to be found in the southern portion of the Antioch Planning Area.

Stabilized Interior Dunes. The Antioch Dunes along the banks of the San Joaquin River contain a unique assemblage of plant and animal species, several of which are found nowhere else in the world. Scattered grasses and forbs, some of which reach shrub size, form the ground cover. The federally endangered Antioch Dunes evening-primrose (*Oenothera deltoides* ssp. *howellii*) and Contra Costa wallflower (*Erysimum capitatum* ssp. *angustatum*) are found here amongst more common species. A number of special-status animals occur in this habitat, the most sensitive of which are the insects, including the federally endangered Lange's metalmark butterfly.

Wetlands. Seasonal wetlands and ponds hold water for only part of the year, and can be found in any part of the Antioch Planning Area, but are more common along the San Joaquin River and seasonal streams in the southern portion of the Planning Area. Coastal brackish marshes are wet year round and are found along the banks of the San Joaquin River. If pickleweed (*Salicornia* sp.) is present, coastal brackish marshes may contain suitable habitat for the State and Federally endangered salt marsh harvest mouse. Other listed species associated with the coastal brackish marsh in the Antioch Planning Area include California clapper rail (*Rallus longirostris obsoletus*), California black rail (*Laterallus jamaicensis coturniculus*).

Alkaline floodplains exist along the banks of the San Joaquin River. These may appear barren because of the difficulty of growing in highly alkaline, frequently disturbed soil. If unprotected, such barren lands tend to attract people seeking recreation in four-wheel drive vehicles, which reduces the vegetation ever further. Stands of pickleweed and saltgrass growing within alkaline floodplains can be habitat for the State and federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*).

Open Water. This category includes the San Joaquin River and permanent waterbodies, such as natural or man-made lakes, ponds, and reservoirs. Although open water does not provide habitat for many plant species, it is

important for wildlife and fish. The San Joaquin River is used as a movement corridor, foraging, and breeding habitat for a variety of native and non-native fish including steelhead (*Oncorhynchus mykiss*), Chinook salmon (*Oncorhynchus tshawytscha*), delta smelt (*Hypomesus transpacificus*), striped bass (*Morone saxatilis*), and many others. Water birds and waterfowls use the lakes and rivers for foraging and breeding and stopovers during migration.

Oak Woodland. Oak woodlands are important habitat for numerous common and special-status wildlife species. Blue oak woodland is found on north-facing slopes and in shady ravines in the Mt. Diablo foothills. Valley oak woodlands once dominated the edges of the Central Valley in vast park-like stands. Valley oaks are the largest and longest-lived of the California oaks. This habitat type has been much reduced by conversion of land to agriculture and because modern grazing patterns prevent the regeneration of young oaks. Valley oak stands are still found in Antioch in Contra Loma Regional Park and other southern portions of the Antioch Planning Area.

Riparian. Riparian vegetation refers to the native scrub or forest occurring along streams and riverbanks. In riparian areas, the roots of trees and other vegetation can easily reach the water table. Such areas are prone to frequent flooding. Riparian vegetation used to be found along most perennial and intermittent streams in the Antioch Planning Area and along the San Joaquin River. This vegetation type has become rare due to disturbance by cattle, riverfront development, and the filling or channelizing of small streams in urban areas. Riparian areas provide important breeding and foraging habitat for many species of birds, mammals, reptiles, and amphibians. The federally-listed California red-legged frog (*Rana aurora draytonii*) occurs along creeks in the Planning Area and the state-listed Swainson's hawk will nest in large trees such as cottonwoods that grow along creeks.

Special-Status Species. Special-status species are defined as:

- Species that are listed, or designated as candidates for listing, as threatened or endangered under the Federal Endangered Species Act;
- Species that are listed, or designated as candidates for listing as rare (plants), threatened, or endangered under the California Endangered Species Act;
- Plant species on List 1A, List 1B, List 2, and List 3 in the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California*;
- Wildlife species listed by the California Department of Fish and Game as species of special concern or fully protected species;
- Species that meet the definition of rare or endangered under the California Environmental Quality Act (under Section 15380 of CEQA¹); and
- Considered to be a taxon of special concern by local agencies.

10.4.1 Biological Resources Objective

Preserve natural streams and habitats supporting rare and endangered species of plants and animals.

10.4.2 Biological Resources Policies

- a. Comply with the federal policy of no net loss of wetlands through avoidance and clustered development. Where preservation in place is found not to be feasible (such as where a road crossing cannot be avoided, or where shore stabilization or creation of shoreline trails must encroach into riparian habitats), require 1) on-site replacement of wetland areas, 2) off-site replacement, or 3) restoration of degraded wetland areas at a minimum ratio of one acre of replacement/restoration for each acre of

¹ This Section of CEQA guidelines states that any species not included on any formal list, can nevertheless be considered rare or endangered if the species can be shown to meet the criteria for listing.

- impacted onsite habitat, such that the value of impacted habitat is replaced.
- b. Preserve in place and restore existing wetlands and riparian resources along the San Joaquin River and other natural streams in the Planning Area, except where a need for structural flood protection is unavoidable.
 - c. Require appropriate setbacks adjacent to natural streams to provide adequate buffer areas ensuring the protection of biological resources.
 - d. Through the project approval and design review processes, require new development projects to protect sensitive habitat areas, including, but not limited to, oak woodlands, vernal pools, and *native* grasslands. Ensure the preservation in place of habitat areas found to be occupied by state and federally protected species. Where preserved habitat areas occupy areas that would otherwise be graded as part of a development project, facilitate the transfer of allowable density to other, non-sensitive portions of the site.
 - e. Limit uses within preserve and wilderness areas to resource-dependent activities compatible with the protection of natural habitats.
 - f. Through the project review process, review, and where necessary, permit the removal of oak trees on a case-by-case basis.
 - g. Preserve heritage trees throughout the Planning Area.
 - h. Within areas adjacent to preserve habitats, require the incorporation of native vegetation and avoid the introduction of invasive species in the landscape plans for new development.

10.5 AIR QUALITY OBJECTIVE AND POLICIES

Antioch has a relatively low natural atmospheric potential for pollution given the persistent and strong winds typical of the area. These winds dilute pollutants and transport them away from the area, so that emissions

released in Antioch may influence air quality in the Sacramento and San Joaquin Valleys. Antioch lies on the south side of Carquinez Strait, which is the only sea-level gap in the central and northern California coastal mountains, resulting in relatively strong and persistent winds flowing through the gap. The large temperature difference between the greater Bay Area to the west and the Central Valley to the east also creates a strong flow of generally west-to-east winds that dilute and transport air pollutants.

Within the Bay Area, periods of high atmospheric stability, known as inversion conditions, severely limit the ability of the atmosphere to disperse pollutants vertically. In the Antioch area, inversions can be found during all seasons, but are more prevalent in the summer months when they are present about 90 percent of the time, both morning and afternoon.

Local air quality is affected by several major stationary pollutant sources that originate in Antioch and upwind in Pittsburg. Antioch's location downwind of the greater Bay Area also means that pollutants from other areas are transported to the area.

Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons. As is true throughout much of the U.S., motor vehicle use is projected to increase substantially in the region. However, due to improving emissions control technology, individual vehicles will contribute substantially fewer pollutants to regional air quality. This decrease in emissions from individual vehicles is not expected to eliminate an overall increase in regional air emissions.

The major pollutants of concern in the San Francisco Bay Area ozone, carbon monoxide, and particulate matter are monitored at a number of locations. There are no monitoring stations in the City of Antioch; the monitoring station closest to the site is in Pittsburg. The Pittsburg monitoring station measures ozone, carbon monoxide, NO₂, and (beginning in