APPENDIX K

Biological Assessment (Lakeville Site)

Draft Biological Assessment:

Sonoma Project

Sonoma County, California

Prepared for:

Station Casinos, Inc.
2411 West Sahara Avenue
Las Vegas, Nevada 89102

Prepared by:

Huffman-Broadway Group, Inc.
Environmental Consultants
828 Mission Avenue
San Rafael , California 94901
TEL: (415) 925-2000 FAX: (415) 925-2006
Contact: Terry Huffman, Ph.D.

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Executive Summary

Background

The purpose of the biological assessment is to characterize the presence and distribution of sensitive species and important ecological features within an overall 2,082-acre study area in southern Sonoma County, California, and to define impacts associated with development on a 318.7-acre development site currently owned by the applicant. The remaining 1,763 acres are to remain as permanent open space as the option to purchase this acreage was donated by the applicant (Station Casinos) to the Sonoma Land Trust.

For ease of reference, we have referred to the overall 2,082-acre study area in four distinct areas, the "North," "Middle," "South," and "West" sections. The portion of the property north of Highway 37 and east of Lakeville Highway (referred to as "North section") comprises approximately 922 acres. The portion of the property south of Highway 37 and north of the Northern Pacific Railroad (referred to as "Middle section") consists of approximately 392 acres. The property south of the railroad to San Pablo Bay is 447 acres and is referred to as the "South section." The 321-acre parcel north of Highway 37 and west of Lakeville Highway is referred to as the "West section."

The 318.7-acre development site currently owned by the applicant and consists of most of the area referred to above as the West section, and a small, rather irregularly-shaped area within the North section. The 318.7-acre development site is expected to become sovereign land of the Federated Indians of the Graton Rancheria. Additional study area includes locations that could be subject to roadway improvements necessary to accommodate proposed development. These areas are non-tribal lands and are within the right-of way of State Highway 37 between the Petaluma River and Sonoma Creek, Lakeville Highway (State Highway 116) from Highway 37 to the City of Petaluma.

Methodology

The biological assessment included surveys for actual and potential presence of species designated under federal law as rare, threatened, or endangered that may occur onsite or in the project vicinity and for designated "critical habitat" under federal law. We have also made a preliminary determination of land that may qualify as "wetlands" under federal law. The biological assessment also characterizes the environmental effects of the proposed project and identifies potential mitigation measures that could be implemented to avoid or ameliorate impacts to special status species and habitats. It is expected that the development site will become tribal trust land. As such, it will not be subject to state or local laws and regulations. However, because the project may require certain road improvements outside the trust lands, we also examined the implications of such improvements under state law (e.g., state-listed species).

Our analysis included the following:

- Review of pertinent literature on habitat characteristics of the site, species of plants and animals expected to utilize the site;

- Field surveys of the site by HBG biologists between May and July 2003;

- Review of the California Natural Diversity Data Base (CNDDB) to determine if populations of endangered, threatened, or rare species have occurred historically or currently occur on the site or in the project vicinity; and

- Wetlands delineation utilizing criteria of the U.S. Army Corps of Engineers. The results of the wetland delineation are pending and will be published in a separate report; results are summarized herein.

Ecological Constraints
Overall ecological constraints within the 2,082-acre study area include the following:

- Potential habitat for federally listed endangered Myrtle's silverspot butterfly and the Callippe silverspot butterfly (documented as occurring on the site) within the North section of the study area.

- Potential habitat for federally-listed threatened California red-legged frog within the North and West sections and the northeast corner of the Middle section. Included are breeding, refugial and dispersal habitats north of Highway 37 (both west and east of Lakeville Highway), and potential breeding habitat with associated refugial habitat in the Middle section.

- Locations of rare plant populations (Sonoma alopecurus, saline clover, and alkali milk-vetch) in the North and Middle sections of the site.

- Avian resources constraints including nesting and/or wintering sites for state species of special concern (including burrowing owl, loggerhead shrike, California horned lark and tricolored blackbird) in the North section, California horned lark in the West section, and locations of all known raptor nests (red-tailed hawk and great-horned owl) along the borders of the Middle and South sections.

- Wetlands and waters of the U.S. potentially subject to jurisdiction of the Corps which are present in all four sections of the site.

Constraints within the 318.7-acre development area include 123.56 acres of wetlands potentially subject to Corps jurisdiction, habitat for the federally-listed threatened California red-legged frog, and a known nesting location for California horned lark.

Project Description
The project proposes development on approximately 175 acres out of the 318.7-acre development site. All development is proposed to take place within the West section of the study area, west of Lakeville Highway. Development would occur under one of two possible scenarios that have an equivalent development footprint, and differ in the arrangement of parking areas and internal access. An area of 1,763 acres of the larger study area will be preserved as the option to purchase this area was donated by Station Casinos to the Sonoma Land Trust to be

managed as open space into perpetuity. This are includes the entirety of the South and Middle sections, and most of the North section.

Impacts and Mitigation Measures

The development is expected to have a footprint of 175.1 acres under either development scenario. The development would, therefore, impact 175.1 acres of habitat, consisting of 101.41 acres of California annual grassland, 73.33 acres of freshwater marsh wetlands, and 0.36 acres of wetlands found within drainages. A total of 73.69 acres of wetlands and waters of the U.S. potentially subject to Corps jurisdiction will be filled to accommodate the proposed development under either development scenario, with consequent loss of the function provided by these areas unless mitigated. Wetlands impacts would occur within 73.33 acres of palustrine emergent seasonal wetlands, and an additional 0.36 acres of impacts would occur within the 0.36 acres found within an on-site drainage.

Grading, placement of fill material and other ground-disturbing activities could promote erosion and allow elevated levels of sediment to wash into on-site wetlands and riparian areas where potential impacts to fish and wildlife species would be possible. In the absence of water quality controls, indirect impacts to animal populations in wetlands and other aquatic habitats could result from the proposed project due to elevated contaminants in stormwater runoff. However, the requirement for construction mitigation that includes the implementation of a Stormwater Pollution Prevention Plan and proper construction techniques and Best Management Practices (BMPs), will minimize adverse effects associated with these activities. Furthermore, standard techniques to control contaminants in stormwater such as oil and grease traps will be employed to further mitigate water quality concerns.

Suitable breeding, refugial and dispersal habitat for California red-legged frogs in the West section of the study area would be directly impacted by development of the proposed facility under either of the development scenarios, and indirect impacts to some of the habitat present within the North section of the site near Lakeville Highway are possible. Grading within the development footprint for either development scenario would result in direct impacts California red-legged frog habitat. Impacts would result from fill placed within 0.12 acres of known breeding habitat for the species within the drainage ditch west of Lakeville Highway. Additional fill would be placed within an additional 2.24 acres of wetlands that serve as potential breeding ponds for the species, and within a separate small drainge of 0.01 acres serving as a dispersal corridor. An additional 33.2 acres of upland refugial habitat (defined as all upland areas impacted within 300 feet of known or potential breeding areas for the species) would be impacted as well.

Existing potential habitats for this species within the remainder of the North section of the study area and at the east end of the Middle section of the study area would remain in open space areas into perpetuity. These areas would not be impacted by development and the long-term conservation value of such property would be improved. A significant mitigation program would need to be developed with the U.S. Fish and Wildlife Service that would consist of means to lessen impacts to individuals of the species during construction and plans to compensate for loss of both breeding and refugial, as well as dispersal habitats. Such a mitigation program would

be developed as part of a Section 7 consultation that would be necessary with the U.S. Fish and Wildlife Service during the process of obtaining a Corps permit for the project.

1.0 Introduction

On behalf of our client, Station Casinos, Inc., the Huffman-Broadway Group, Inc. (HBG) has conducted a biological assessment of the proposed Sonoma County project in Sonoma County, California. The purpose of the biological assessment is to characterize the presence and distribution of sensitive species and important ecological features within an overall 2,082-acre study area, and to define impacts associated with development on a 318.7-acre development site currently owned by the applicant. The remaining 1,763 acres are to remain as permanent open space as the option to purchase this acreage was donated by the applicant (Station Casinos) to the Sonoma Land Trust.

The overall project area is located in southern Sonoma County, California, in the vicinity of the intersection of Highway 37 and the Lakeville Highway as shown on Figure 1. For ease of reference, we have referred to the 2,082-acre study area in four distinct parcels, the "North," "Middle," "South" and "West" sections (see the aerial photograph in Figure 2). The 2,082 study area is divided roughly in half by Highway 37, which bisects the property in a generally east/west direction. The portion of the property north of Highway 37 and east of Lakeville Highway (the North section) comprises approximately 922 acres. The portion of the property south of Highway 37 and north of the Northern Pacific Railroad (the "Middle section") consists of approximately 392 acres. The portion of the property south of the railroad to San Pablo Bay is 447 acres (the "South section"). The 321-acre parcel north of Highway 37 and west of Lakeville Highway is referred to as the "West section."

Section Name	Acres
North	922
Middle	392
South	447
West	321
TOTAL	**2082**

The 318.7-acre development site currently owned by the applicant is shown in Figure 1 and consists of most of the area referred to above as the West section, and a small, rather irregularly-shaped area within the North section. The 318.7-acre development site is expected to become sovereign land of the Federated Indians of the Graton Rancheria. Additional study area includes locations that could be subject to roadway improvements necessary to accommodate proposed development. These areas are non-tribal lands and are within the right-of way of State Highway 37 between the Petaluma River and Sonoma Creek, Lakeville Highway (State Highway 116) from Highway 37 to the City of Petaluma (see Figure 3).

This assessment describes biological resources present within the overall study area, including a survey for actual and potential presence of species designated under federal or California law as rare, threatened, or endangered species that may occur onsite or in the project vicinity and for

designated "critical habitat" under federal law. This biological assessment also defines the presence of land that may qualify as "wetlands" under federal or state law.[1] The biological assessment also characterizes the environmental effects of the proposed project within the 318.7-acre development site and identifies potential mitigation measures that could be implemented to avoid or ameliorate impacts to special status species and habitats.

Because the 318.7-acre development site is expected to become tribal trust land, it will not be subject to state or local laws and regulations. However, because the project may require certain road improvements outside the trust lands, we have examined the impacts to state species on these lands. Although state jurisdiction does not apply to trust land, the potential presence of state protected species were noted during biological surveys on both trust and non-trust land. Similarly, potential impacts to state species are identified on trust and non-trust land.

Our analysis included the following:

- Review of pertinent literature on habitat characteristics of the site, species of plants and animals expected to utilize the site;
- Field surveys of the site by HBG biologists between May and July 2003;
- Review of the California Natural Diversity Data Base (CNDDB) to determine if populations of endangered, threatened, or rare species have occurred historically or currently occur on the site or in the project vicinity; and
- Wetlands delineation utilizing criteria of the U.S. Army Corps of Engineers.

The following discussion is based, in part, on these surveys and reviews.

The location of the development site within the overall study area is shown on Figure 1. Figure 2 is an aerial photograph of the study area. The project proposes development on approximately 175 acres out of the 318.7-acre development site. An area of 1,763 acres of the larger study area will be preserved as the option to purchase this area was donated by Station Casinos to the Sonoma Land Trust to be managed as open space into perpetuity.

1 It is expected that the areas examined will become tribal trust land. As such, they will not be subject to State or local laws and regulations. However, because the project may require certain road improvements outside the trust lands, we also examined the implications of such improvements under State law (e.g., state-listed species).

2.0 Existing Setting

2.1 General Setting

The study area is primarily annual grassland interspersed with wetland areas and ranges in elevation from approximately 5 feet mean sea level (msl) to about 450 feet msl.

A soil map of the study area is presented on Figure 4. Soils are generally deep and well-developed, although often poorly drained, especially in the lower-lying areas. These soils generally have high clay content. No bedrock exposures occur anywhere on the site. Localized areas of erosion occur in the hill portions of the site.

The North section is largely undeveloped; however, some areas are used for grazing. The southern portion of the North section adjacent to Highway 37 is generally flat with gentle slopes. This portion of the site is historic baylands. Figure 5 shows the extent of historic baylands in the study area. Moving towards the northeast corner of the North section, the slopes increase in steepness with the maximum elevations occurring along the eastern edge of the property. These hills are dissected by a number of narrow, steep-sided, generally west- and south-draining canyons. Elevations in the North section range from approximately 7 feet msl in the western portion to 380 feet msl in the northeast corner. A ranch area extending eastward from Lakeville Highway in the southwest portion of this area is excluded from the study area.

Elevations in the Middle and South sections are lower than in the North portion and range from sea level to about 160 feet msl in the northeastern corner adjacent to Highway 37. The majority of the South section however is generally flat and about 5 feet msl or lower. The South section and the western portion of the Middle section are historic baylands (see Figure 5) and are currently used for growing row crops. In the South section, a narrow strip of land outside the current levee lies within the tidal influence of San Pablo Bay. The eastern portion of the Middle section is primarily annual grassland with interspersed wetland areas and is occupied by moderate, low south- and west-facing hill slopes.

The West section (the development site) is mostly low-lying and gently undulating, consisting of annual grasslands with interspersed wetlands. The eastern portion of this area is occupied by moderate, low southwest-facing hill slopes. Elevations in this section of the site range from approximately 3 feet msl in the southwest corner to 55 feet msl in one area along Lakeville Highway.

Most of the study area is occupied by grassland. Shrubs are mostly absent. Native trees are restricted to a few small stands of willows (*Salix* spp.) in canyons in the hills, one small clump of red willow (*Salix laevigata*) in the West section, and a few individuals of arroyo willow (*Salix lasiolepis*) in the Middle section. Planted or adventive trees occur at a few other locations, including two small, dense stands of eucalyptus (*Eucalyptus* sp.) just north of the railroad right of way in the Middle section. A number of shallow seasonal pools occur at various locations within the study area. A pond is located in the western portion of the West section. In addition, a stock pond is immediately adjacent to the North section near its western boundary along Lakeville Highway.

Two areas with houses, other buildings, and landscaping are included in the survey area. One is located along Highway 37 in the north-central portion of the Middle section, and one is located along Lakeville Highway in the western portion of the North section. Other than a few corrals and water tanks and a windmill, no other developed features are located on the site.

2.2 Preliminary Reports

A biologist from CH2M Hill conducted a reconnaissance level investigation of the site's biological resources in January 2003; the results are described in the Environmental Constraints Analysis Report (January 2003). In March 2003 a team of CH2M Hill biologists conducted botanical, wildlife, and wetlands surveys of the North and Middle sections of the study area. These studies led to preparation of the following preliminary reports:

- Environmental Constraints Analysis Report (January 2003)
- Biological Reconnaissance Survey of Northern and Middle Sections of Kenwood Investments Project Site, Sonoma County, California (March 27, 2003)
- Draft Preliminary Evaluation of the Potential for Wetland Restoration and Biological Resources Habitat Creation on the Southern Portion of the Kenwood Investments Sonoma Property (April 9, 2003)

2.3 Vegetation Communities

EcoSystems West botanists Roy Buck and Glenn Clifton conducted a field survey of the West, North and Middle sections between 16 May and19 June 2003. Virginia Dains surveyed the South section on May 22, 2003. Field surveys of Lakeville Highway and Highway 37 were conducted by Virginia Dains on May 23 and June 23-26, 2003. All sites were surveyed in detail on foot. All vascular plant species encountered that were identifiable at the time the surveys were conducted were identified to species or infraspecific taxon, using keys and descriptions in Abrams (1923, 1944, 1951); Abrams and Ferris (1960); Munz and Keck (1973); Hickman (1993); and Best et al. (1996). All habitat types occurring on the site were characterized and data was recorded on physiognomy, dominant and characteristic species, topographic position, slope, aspect, substrate conditions, hydrologic regime, and evident disturbance for each habitat type. In classifying the habitat types on the site, the generalized plant community classification schemes of Holland (1986); Sawyer and Keeler-Wolf (1995); and CDFG (2002) were used. The final classification and characterization of the habitat types of the study area was based on field observations.

Five major habitat types are present in the North, West and Middle sections of the study area: California annual grassland, seasonal pools, drainageways, willow riparian woodland, and developed/ruderal. California annual grassland occupies most of the site. Seasonal pools are scattered in various locations in the study area, with the greatest concentration of them in the West section. The drainageways habitat type is discontinuous along watercourses, mostly in canyon bottoms in the hill portions of the North section. Several small stands of willow riparian woodland occur in canyon bottoms in the hill areas. Developed/ruderal habitat, is primarily associated with human occupation and intensive, repeated disturbance.

Several additional habitat types occur on or immediately adjacent to the study area, but each occurs only once. Seasonal drainage habitat occupies a relatively small area in the North section,

the only occurrence of this habitat type on the project site. A stock pond lies offsite immediately adjacent to the North section near its boundary with Lakeville Highway. An area of salt marsh habitat is present in the South section.

These habitat types are described below for each section of the project area surveyed by EcoSystems West. Lists of plant species identified during onsite field surveys on the North, West, Middle and South sections of the study area are presented in Tables 1, 2, 3 and 4, respectively. A list of plant species for the relevant roadway rights of way is presented in Table 5. The extent and distribution of vegetation types within the study area is shown in Figure 6.

2.3.1 North Section

A total of 243 taxa of vascular plants growing without cultivation were observed in the North section of the study area. Of these, 136 taxa are native and 105 taxa are non-native. Two species could be identified only to genus, and it could not be determined whether they are native or non-native. A list of all vascular plant species observed (not including planted or cultivated species) in this portion of the study area is presented in Table 1.

The California annual grassland habitat type overwhelmingly predominates in this section. Six seasonal pools occur in the southwestern portion of this section in areas of relatively low relief, and two additional seasonal pools occur in the hilly eastern portion. The drainageways habitat type occurs discontinuously along and adjacent to watercourses in this section, mainly in canyon bottoms in the hill areas. Small areas of willow riparian woodland also occur in canyon bottoms in the hill areas. An offsite perennial pond is located immediately adjacent to the western portion of this section. One area of developed/ruderal habitat is also present.

California annual grassland

This is the predominant habitat type in the North section and throughout most of the study area, and occupies a much greater area than any other habitat type. This grassland is very heterogeneous in species composition and physiognomy. Much of this diversity is correlated with evident microhabitat factors, such as microtopography, slope, aspect, soil type, and grazing intensity. This grassland is mostly without woody species, and is comprised of a mostly dense cover (generally greater than 80 percent, and often 100 percent or nearly so) of grasses and associated herbs. The grasses are mostly 1 to 3 feet tall, although locally where grazing is relatively heavy they may be lower.

The dominant grasses are mostly annual and non-native, and, at any given location, include some combination of the following species: slender wild oat (*Avena barbata*), Italian rye grass (*Lolium multiflorum*, sometimes a biennial), soft chess (*Bromus hordeaceus*), ripgut grass (*Bromus diandrus*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), rattlesnake grass (*Briza maxima*), hare barley (*Hordeum murinum* ssp. *leporinum*), six-weeks fescue (*Vulpia bromoides*), and purple false brome (*Brachypodium distachyon*). Another non-native annual grass, the highly invasive species Medusa head (*Taeniatherum caput-medusae*), is also locally dominant in sizable patches, mostly in the hill areas. Italian rye grass is often the overwhelming dominant in the flatter, lower-lying portions of the site, and Mediterranean barley is also especially abundant in these areas, while rattlesnake grass and purple false brome are most abundant in the hill areas.

Two native perennial bunchgrasses, purple needlegrass (*Nassella pulchra*) and California oatgrass (*Danthonia californica*), are widespread in this grassland and are often locally among the dominants, although they always share dominance with non-native grass species. The native rhizomatous perennial grass creeping wild rye (*Leymus triticoides*) is locally dominant in large patches, mostly in the flatter areas and in canyon bottoms in the hill areas. Another native perennial grass, meadow barley (*Hordeum brachyantherum*), is widespread, but generally not among the dominants.

Associated with the grasses is a variety of herbaceous species, both native and non-native. Characteristic native herbs include owl's-clover (*Castilleja densiflora* ssp. *densiflora*), hayfield tarplant (*Hemizonia congesta* ssp. *congesta*), harvest brodiaea (*Brodiaea elegans* ssp. *elegans*), sky lupine (*Lupinus nanus*), coast tarplant (*Madia sativa*), yellowbeak owl's-clover (*Triphysaria versicolor* ssp. *faucibarbata*), paint-brush orthocarpus (*Castilleja ambigua* ssp. *ambigua*), prickly coyote-thistle (*Eryngium armatum*), California poppy (*Eschscholzia californica*), Lindley's annual lupine (*Lupinus bicolor*), Douglas' microseris (*Microseris douglasii* ssp. *douglasii* and ssp. *tenella*), blow-wives (*Achyrachaena mollis*), and Monterey centaury (*Centaurium muehlenbergii*). The low subshrub alkali heath (*Frankenia salina*) is locally moderately abundant in a few low-lying areas in this section. The diversity of native herbs is generally somewhat greater in the hill areas than in the flatter areas; characteristic native species occurring in the hill areas which are absent or uncommon in the flatter areas include Johnny-jump-up (*Viola pedunculata*), chick lupine (*Lupinus microcarpus* var. *densiflorus*), silver lupine (*Lupinus albifrons* var. *collinus*), narrow-leaved mule-ears (*Wyethia angustifolia*), Sierra foothills microseris (*Microseris acuminata*), large-flowered agoseris (*Agoseris grandiflora*), California buttercup (*Ranunculus californicus*), Ithuriel's spear (*Triteleia laxa*), soap plant (*Chlorogalum pomeridianum*), yellow mariposa-lily (*Calochortus luteus*), blue-eyed grass (*Sisyrinchium bellum*), and royal larkspur (*Delphinium variegatum* ssp. *variegatum*). A few native species are found mostly in the flatter areas; these include white brodiaea (*Triteleia hyacinthina*) and sour clover (*Trifolium fucatum*). The special-status species saline clover (*Trifolium depauperatum* var. *hydrophilum*) is also scattered and locally abundant in the grassland in flatter, lower-lying areas in this section and in the Middle section.

A large number of non-native herbs are also characteristic and widespread in the non-native grassland habitat type. These include wild radish (*Raphanus sativus*), bur-clover (*Medicago polymorpha*), common vetch (*Vicia sativa* ssp. *sativa*), purple vetch (*Vicia benghalensis*), subterranean clover (*Trifolium subterraneum*), strawberry clover (*Trifolium fragiferum*), long-beaked filaree (*Erodium botrys*), English plantain (*Plantago lanceolata*), bindweed (*Convolvulus arvensis*), shamrock clover (*Trifolium dubium*), yellow parentucellia (*Parentucellia viscosa*), purple star thistle (*Centaurea calcitrapa*), yellow star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echioides*), hairy cat's-ear (*Hypocharis radicata*), black mustard (*Brassica nigra*), sheep sorrel (*Rumex acetosella*), fiddle dock (*Rumex pulcher*), mayweed (*Anthemis cotula*), cut-leaved geranium (*Geranium dissectum*), Italian thistle (*Carduus pycnocephalus*), and bellardia (*Bellardia trixago*). The large, invasive, non-native species artichoke thistle (*Cynara cardunculus*) is widespread in the hill areas in this section, and locally forms large, dense patches on hillsides in the northern portion of the site.

A number of small watercourses and drainage ditches traverse portions of the West, North, and Middle sections, in the lower-lying, flatter areas of the study area. For the most part, these features were dry at the time of the survey and were sparsely vegetated. The species composition in these features is generally not sharply distinct from that of the adjacent non-native grassland, although they often contain some species indicative of seasonal moisture, most prominently the non-native species annual beard grass (*Polypogon monspeliensis*) and brass buttons (*Cotula coronopifolia*). For the purposes of characterizing vegetation, these features are included in the non-native grassland habitat type, as are those segments of canyon-bottom watercourses in the hill areas that do not support the distinctive drainageways habitat type (below).

This habitat type is recognized as the California annual grassland alliance by CDFG (2002) and as the California annual grassland series by Sawyer and Keeler-Wolf (1995). It corresponds to the non-native grassland habitat type of Holland (1986). However, it also has affinities to the coastal terrace prairie habitat type of Holland (1986) and CDFG (2002), a CNDDB "high priority" habitat type (CDFG 2002). The coastal terrace prairie habitat type is characterized by dominance of native perennial bunchgrasses, with a diverse assortment of native herb species as associates (Heady et al. 1977). It is presumed that all of the grasslands in the study area represented coastal terrace prairie before the introduction of non-native species. Many of the native herbs, along with the native perennial bunchgrasses purple needlegrass and California oatgrass, are characteristic coastal terrace prairie species. Areas in which one or both of these bunchgrass species are among the dominant grasses come closest to retaining the character of the original coastal terrace prairie. Heady *et al.* (1977) lists four major reasons for the decline of coastal prairie habitats as overgrazing; the introduction of aggressive, weedy non-native species; the cessation of frequent fires; and cultivation. It is presumed that the first three of these factors are responsible for the conversion of the original coastal terrace prairie on the site to California annual grassland, and the grassland on the site could be regarded as degraded coastal terrace prairie, with some areas more degraded than others.

Seasonal pools

A number of seasonal pools of varying sizes are located in the study area. These are shallow but distinct topographic depressions that hold water for varying lengths of time during the winter and spring, then dry out completely by late spring or summer. Most of these pools are located in the flatter, lower-lying portions of the area, although two small seasonal pools are located in the hill areas of the North section: one on an elevated upland terrace, and one occupying a small, apparently natural bowl on the side of a hill, with drainage blocked by higher ground on the downhill side.

The majority of the seasonal pools in the study area are located in the West section, although six pools occur in the southwestern portion of the North section, in addition to the two small seasonal pools in the hill areas. Most of the following discussion is general and covers all the seasonal pools in the area, including the west and Middle sections as well as the North section. The seasonal pools on the site range in size from less than 0.1 to nearly 5 acres. Most of the seasonal pools occupy less than 0.4 acres. Over all or most of their area, these seasonal pools are quite distinct in vegetation composition from the surrounding California annual grassland. In some cases, they are indistinct around all or portions of their margins, and gradually intergrade

with the grassland. This generally occurs where the topographic gradient from grassland to pool bottom is gradual. The vegetation cover is generally relatively high, usually greater than 70 percent and often 90-100 percent, although a few pools have sizable areas with much lower cover.

These pools support a variety of native and non-native species, most of them indicators of seasonally wet or moist conditions. The species composition is quite heterogeneous from pool to pool, and sometimes in different portions of the same pool. Native species found in all or a high percentage of pools include California semaphore grass (*Pleuropogon californicus*), Jepson's coyote-thistle (*Eryngium aristulatum* var. *aristulatum*), field mint (*Mentha arvensis*), and cocklebur (*Xanthium strumarium*). Other native species that are important in some pools include pale spike-rush (*Eleocharis macrostachya*), stipitate allocarya (*Plagiobothrys stipitatus* var. *micranthus*), brown-headed rush (*Juncus phaeocephalus* var. *paniculatus*), flowering quillwort (*Lilaea scilloides*), smooth lasthenia (*Lasthenia glaberrima*), and spiny clotbur (*Xanthium spinosum*). Non-native species found in all or many pools include annual beard grass, curly dock (*Rumex crispus*), hyssop loosestrife (*Lythrum hyssopifolium*), and brass buttons. Other non-native species important in some pools include bird's-foot trefoil (*Lotus corniculatus*), Italian rye grass (generally but not always around margins, in areas transitional to grassland), hairy-flowered bent grass (*Agrostis avenacea*), bindweed, and mayweed (often around margins).

Many pools, or large portions of them, are dominated by some combination of California semaphore grass, Jepson's coyote-thistle, field mint, annual beard grass, and pale spike-rush. Pale spike-rush is generally only present in the deeper portions of the better-developed pools. In some pools, or portions of them, cocklebur is a principal dominant; often, but not always, this species is a dominant in shallower pools or in shallower portions of deeper pools. Other species that are occasionally among the dominants include curly dock, bird's-foot trefoil, bindweed, mayweed, hairy-flowered bent grass, and (generally near margins) Italian rye grass.

Seasonal pools of the type found on the site are not adequately treated in generalized vegetation classification schemes, but these pools do have some of the attributes of the northern claypan vernal pool habitat type of Holland (1986) and CDFG (2002), which is recognized as a CNDDB "high priority" habitat type (CDFG 2002). A few species found in some pools are generally considered indicators of typical vernal pool habitats; these include Jepson's coyote-thistle, stipitate allocarya, maroon-spotted downingia (*Downingia concolor* var. *concolor*), flat-faced downingia (*Downingia pulchella*), and American pilularia (*Pilularia americana*). A number of other species occurring in these pools are also characteristic species of typical vernal pools, but are also commonly found in other seasonally moist habitats; these include pale spike-rush, flowering quillwort, smooth lasthenia, and purslane speedwell (*Veronica peregrina* ssp. *xalapensis*). However, the seasonal pools on the site differ from typical vernal pools in a number of respects: the generally relatively high vegetation cover; the relative abundance of non-native species; the lack of typical vernal pool vegetation structure (i.e., concentric zonation); the abundance, in many pools, of native species not generally found, or found only at low abundance, in typical vernal pools, including especially field mint, cocklebur, and spiny clotbur; and the absence of many typical vernal pool indicator species.

The eight seasonal pools located in the North section are quite diverse in species composition as well as in size and topographic position. For example, species such as Jepson's coyote-thistle and cocklebur are dominants in some pools and absent or nearly so from others. Three especially characteristic vernal pool species, maroon-spotted downingia, flat-faced downingia, and American pilularia, were found only in seasonal pools in this section. The largest pool is located in the southwest portion of this section; this pool is mostly quite shallow and is somewhat anomalous in species composition over most of its area, being largely dominated by cocklebur, with many typical species absent or confined to a deeper central portion. The two pools in the hill portion of this section both appear to be natural features. They are largely dominated by species such as Jepson's coyote-thistle, California semaphore grass, and pale spike-rush, and, although they are relatively small and support relatively few species, they, do not otherwise differ appreciably from other seasonal pools elsewhere on the site.

Drainageways

Areas along and immediately adjacent to seasonal or permanent watercourses in the area that are seasonally or (less commonly) permanently wet often support an assemblage of moisture-loving species that is quite different from the adjacent California annual grassland. All examples of this habitat type in the study area are in the North section, most in canyon bottoms in the hill areas. This habitat type is more or less discontinuous along watercourses, and typically alternates with areas of California annual grassland. It is typically dominated by some combination of the native species Baltic rush (*Juncus balticus*), brown-headed rush, and pale spike-rush. Other species characteristic of this habitat type, but not generally dominant, include the native species northern willow-herb (*Epilobium ciliatum*) bugle hedge-nettle (*Stachys ajugoides* var. *ajugoides*), toad rush (*Juncus bufonius* var. *bufonius* and var. *congestus*) common or seep-spring monkeyflower (*Mimulus guttatus*), and tall cyperus (*Cyperus eragrostis*) and the non-native species annual beard grass and ditch beard grass (*Polypogon interruptus*). Southern cattail (*Typha domingensis*) is occasional where water ponds for particularly long periods. Dense patches of the native, moisture-loving fern ally giant horsetail (*Equisetum telmateia* ssp. *braunii*) occur at a few locations. Occasionally, the characteristic species of this habitat type, especially Baltic rush, extend for some distance up the banks above the watercourses, indicating local areas of seepage.

This habitat type is not adequately treated in generalized vegetation classification schemes, but it has affinities to both the freshwater seep and coastal and valley freshwater marsh habitat types of Holland (1986) and CDFG (2002) and to the spikerush series of Sawyer and Keeler-Wolf (1995).

Willow riparian woodland

Several small stands of willows, some consisting of only a single tree, occur in and near the bottoms of canyons in the hill portion of this section. This habitat type occurs only in the North section. These stands are dominated by arroyo willow (*Salix lasiolepis*) and/or red willow (*Salix laevigata*). The canopy is open to locally dense. Because cattle frequently congregate under the trees in hot weather, the understory is mostly highly disturbed by grazing and trampling. Essentially no shrubs are associated with this habitat type. Herbaceous cover in the understory ranges from none to moderate or, locally, dense. It is of low diversity and consists mostly of non-native species, particularly Italian rye grass, Italian thistle, and annual beard grass.

This habitat type might best be treated as a somewhat degraded example of the red willow/arroyo willow association of CDFG (2002). It also has affinities to the central coast arroyo willow habitat type of Holland (1986) and CDFG (2002) and to the arroyo willow series of Sawyer and Keeler-Wolf (1995) and the mixed willow and red willow alliances (series) of Sawyer and Keeler-Wolf (1995) and CDFG (2002).

Pond
One permanently inundated pond occurs offsite but immediately adjacent to the western portion of the North section. The drying margins of this pond are densely vegetated. Pale spike-rush is the most abundant species, with knot grass (*Paspalum distichum*) and tall cyperus as frequent associates. Field mint, Baltic rush, and brown-headed rush are locally abundant in patches around the outer edges of this drying margin. A zone of dense viscid bulrush (*Scirpus acutus* var. *occidentalis*) is adjacent to the dam, in the water; several other dense clumps of viscid bulrush occur elsewhere in shallow water near the edges of the pond. Narrow-leaved cattail (*Typha angustifolia*) is associated with viscid bulrush in one of these patches. Long-leaved pondweed (*Potamogeton nodosus*) is locally abundant in shallow water near the pond edges.

Developed/ruderal
One area of developed/ruderal habitat occurs in the western portion of the North section, just east of Lakeville Highway. This area contains a residence and outbuildings. Where not occupied by buildings, driveways, or other developed features, this area is vegetated primarily by landscaping plants or weedy species.

2.3.2 West Section

A total of 102 taxa of vascular plants were observed growing without cultivation in the West section of the study area (including most of the development site). Of these, 41 taxa are native and 61 taxa are non-native. A list of all vascular plant species observed (not including planted or cultivated species) in this portion of the study area is presented in Table 2.

Two major habitat types occupy most of this section. The largest area is occupied by the California annual grassland habitat type. Thirteen more or less well-defined seasonal pools, the majority of the examples of this habitat type on the site, occur in this section; seasonal pools are distributed throughout the section, except in the somewhat elevated eastern portion. There are also a number of shallow depressions that are transitional to seasonal pools, but that, for the purposes of characterizing vegetation, are classified with the California annual grassland habitat type. In addition, one minor habitat type, seasonal drainage, occurs in this section.

California annual grassland
The California annual grassland in the West section is generally similar to that elsewhere on the site, although it is notable for its relatively low species diversity. Many of the native and some of the non-native species characteristic of this habitat type elsewhere on the site, especially in the hill areas of the North section, are absent or uncommon in the West section. Italian rye grass is especially prominent as a dominant grass in much of this section. Dense mats formed by such non-native species as subterranean clover and strawberry clover occur in low-lying grassland areas throughout the site, but are especially extensive in the West section. The native perennial

bunchgrass purple needlegrass is absent from most of this section; California oatgrass is scattered, and is locally among the dominants in a few areas.

In much of the West section, drainage is somewhat impeded, and topographic gradients are slight. A number of very shallow, poorly defined depressions occur in this area that are transitional between the California annual grassland habitat type and the seasonal pools habitat type. Where they were not sharply distinct in vegetation composition, these areas were treated as belonging to the California annual grassland habitat type for the purposes of characterizing vegetation, even though they typically contained one or more species characteristic of seasonal pools, especially including California semaphore grass, Jepson's coyote-thistle, and annual beard grass.

Seasonal pools
As noted above, the largest number of seasonal pools on the site (13) is in the West section. This habitat type is discussed in detail under the North section discussion (above). Seasonal pools are distributed throughout the West section, and vary greatly in size and species composition. The second-largest seasonal pool on the site, located near the southwest corner of the West section west of Lakeville Highway, is especially well-developed, and retains water in its central portion longer than any of the other seasonal pools in the study area; this pool occupies several acres.

Seasonal drainage
In the southeast portion of the West section, there is a seasonal drainage whose vegetation is unlike that of any other habitat type on the site, although it has affinities to the seasonal pool habitat type. The vegetation in this drainage is heterogeneous and is composed mainly of native and non-native species of seasonally moist habitats. Much of this drainage is sparsely vegetated (20-30 percent cover), with the principal species being water manna grass (*Glyceria occidentalis*), annual beard grass, hyssop loosestrife, flowering quillwort, field mint, California semaphore grass, brass buttons, spiny clotbur, cocklebur, Jepson's coyote-thistle, and stipitate allocarya. The relatively narrow downstream portion is relatively densely vegetated (80-90 percent cover), with the dominant species being field mint, Jepson's coyote-thistle, California semaphore grass, common knotweed (*Polygonum arenastrum*), and brass buttons. Also included in this habitat type is a broader low-lying area adjacent to the main drainage with relatively dense vegetation, much of it spiny clotbur; other important species in this area include common knotweed, California semaphore grass, annual beard grass, field mint, and Jepson's coyote-thistle.

2.3.3 Middle Section

A total of 168 taxa of vascular plants were observed growing without cultivation in the Middle section of the Sonoma Project study area. Of these, 76 taxa are native and 92 taxa are non-native. A list of all vascular plant species observed (not including planted or cultivated species) in this portion of the study area is presented in Table 3.

California annual grassland occupies the eastern portion of this section, including slightly more than half the area. The western portion, including slightly less than half the area, is occupied by cultivated hayfields, which share many species with the California annual grassland but which

are cultivated for hay that is harvested every year. One area of developed/ruderal habitat is also located in this section.

California annual grassland
The California annual grassland of this section is similar to that elsewhere in the study area. It is quite heterogeneous in this section, although it is not as diverse in species composition as in the North section, especially the hillier areas. As in the other sections, Italian rye grass is especially prominent as a dominant in the lower-lying areas. The native perennial bunchgrasses purple needlegrass and California oatgrass are locally among the dominant grasses in some portions of this section. Large patches of creeping wild rye occur in the grassland in this section, especially in the lower-lying areas. Although a sizable number of both native and non-native herbs are widespread in the grassland in this section, most of the native herb species especially characteristic of the hillier areas of the North section do not occur in this section. Scattered, more or less localized low, seasonally moist places in this grassland in this section provide habitat for the special-status species saline clover; another special-status species, alkali milk-vetch, occurs in one area near the southeast corner of this grassland.

Seasonal pools
Three seasonal pools occur near Highway 37 in the north-central portion of this section. These pools are generally similar to seasonal pools elsewhere in the study area, although they are relatively low in species diversity. They are notable for relatively dense cover of Jepson's coyote-thistle and, more locally, dense cocklebur. California semaphore grass is also an important species in these pools.

Cultivated hayfields
The western portion of the Middle section is occupied by cultivated hayfields. These hayfields are apparently regularly disked, and the hay had been cut at the time of our survey. The principal grass in these hayfields appears to be English rye grass (*Lolium perenne*), presumably planted. Annual beard grass is widespread and moderately abundant. Bristly ox-tongue and bindweed are abundant and widespread. Hayfield tarplant is also widespread, but less abundant. Hyssop loosestrife and brass buttons are locally abundant in some areas, and a substantial amount of curly dock occurs in one area.

Developed/ruderal
One large ranch area off Highway 37 in the north-central portion of this section contains residences, barns, and other outbuildings. Where not occupied by buildings, driveways, or other developed features, these areas are vegetated primarily by landscaping plants or weedy species.

2.3.4 South Section

A list of plant species observed (not including planted or cultivated species) in this portion of the study area is presented in Table 4.

Ruderal Vegetation of Field Borders, Roads, and Levees
Outside of the fields planted to hay, field margins, road edges and levees comprise most of the vegetated area of the study area. Ruderal, mostly annual herbaceous vegetation, is dominant in these locations. Levees support discontinuous patches of coyote bush (*Baccharis pilularis*) and

fennel (*Foeniculum vulgare*). Annual grasses including rip-gut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum leporinum*), and medusa grass (*Taeniathrum caput-medusae*) are found with star thistle (*Centaurea solstitialis*), vetch (*Vicia sativa*), prickly ox-tongue (*Picris echioides*), and wild radish (*Raphanus sativa*) in these ruderal zones. Roads around fields support low growing knotweed (*Polygonum arenastrum*), Persian speedwell (*Veronica persica*), and plantain (*Plantago elongata*). Blue gum (*Eucalyptus globulus*) trees of significant size trees (>24" in trunk diameters) are found in five locations in field corners.

Drainage Ditches

Drainage ditches have no open and direct connection to the San Pablo Bay salt marsh. Tule (*Scirpus robustus*) and cattail (*Typha latifolia*) are found in patches along the steep sided drains. Saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), and brass buttons (*Cotula coronopifolia*) are found where standing water is shallow and there is adequate rooting substrate along the margins of the excavated channels. Water levels in the drains fluctuate with the season and farming activity and active maintenance of the drains prevents establishment of significant perennial vegetation.

Seasonal Wetlands

The silty clay surface of the Reyes series soil precludes the downward percolation of rainwater resulting in ponding or surface saturation. These conditions favor plant species known to occur in vernal pools including several special status plants in Sonoma County. In addition to the poor drainage properties of the underlying soils, farming activity and the use of heavy equipment for harvesting, hauling and planting has created depressions in the old tidal landscape that are seasonally wet. The annual vegetation of these depression includes popcornflower (*Plagiobothrys bracteatus*), rabbit's foot grass (*Polypogon monspeliensis*), annual canary grass (*Phalaris paradoxa*), toad rush (*Juncus bufonius*) and little quaking grass (*Briza minor*). In more alkaline settings, brass buttons (*Cotula coronopifolia*) is dominant. The lack of a diversity of native vernal pool species in these seasonal wetlands is evidence for the disturbed nature of the habitat. It is probable that the reworking of the fields during plowing and planting annually alters these depressions.

Salt Marsh

Salt marsh outside the existing levee consists uniformly of pickleweed (*Salicornia virginica*). The band of transitional habitats from upland to pickleweed marsh is narrow. The bases of the levees support saltgrass, alkali heath (*Frankenia salina*), hen fat (*Atriplex patula*), and perennial peppergrass (*Lepidium latifolium*). The parasitic salt marsh dodder (*Cuscuta salina*) can be seen in patches on the mat of pickleweed. Channels through the marsh are sparsely vegetated with cordgrass (*Spartina foliosa*), and older levees possibly on the property boundary are marked by rows of coyote bush.

2.3.5 Highway Rights of Way

The approximate 11-mile surveyed section of Lakeville Highway traverses annual grasslands, agricultural fields, vineyards, pasture, marsh, and horticultural/urban settings. It is crossed by Stage Gulch and several unnamed perennial and intermittent drainages arising from the hills to the east. A list of plant species observed (not including planted or cultivated species) along the highway right of way is presented in Table 5.

The surveyed 4-mile section of Black Point Road primarily crosses through annual grassland used for range and agricultural fields. It is crossed by drainages that support willow scrub riparian vegetation, agricultural drains, and a few intermittent streams coming from the hilly terrain to the north.

The intersection of Black Point Road and SR121 at the eastern end of the survey area contains willow scrub riparian vegetation, emergent marsh, a roadside drain, and horticultural plantings. The northern sections are covered with ruderal annual grassland vegetation.

Ruderal Vegetation of Roadsides and Field Borders

Most of the roadside vegetation consists of annual grasses and herbs growing on disturbed gravelly road fill. For much of the survey area, the base of the fill corresponded to the lateral extent of the right of way. Very few areas were found where vegetation of the adjacent lands extended into the survey area. More often, disturbances such as over spray of herbicides, irrigation of roadside horticultural plantings and agricultural drainage, mowing, and the escape and establishment of agricultural and horticultural plants into the right of way affected the species composition and limited the habitat suitability for special status plants.

Typical ruderal species included annual grasses such as rip-gut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum leporinum*), and medusa grass (*Taeniathrum caput-medusae*), and weedy broadleaf species such as star thistle (*Centaurea solstitialis*), wild radish (*Raphanus sativa*), and hedge musard (*Sisymbrium officianale*). Near the northern section of Lakeville Highway, Queen Anne's lace (*Daucus carota*) and Italian thistle (*Carduus pycnocephalus*) lined the roadside. At the western end of the survey area along Black Point Road where it borders low hay fields, fennel (*Foeniculum vulgare*), bristly ox-tongue (*Picris echioides*), milk thistle (*Silybum marianum*), and dense thickets of creeping wild rye (*Leymus triticoides*) are found along side roadside drainage ditches. On the compacted ground of road shoulders low growing knotweed (*Polygonum arenastrum*), Persian speedwell (*Veronica persica*), puncture vine (*Tribulus terrestris*), fluellin (*Kicksia elatine*), and rat tail fescue (*Vulpia myuros*) are able to persist.

Roadside drainage ditches were examined for suitability to harbor rare species. Typically weedy species such as Johnson grass (*Sorghum halepense*) or Harding grass (*Phalaris aquatica*) lined the drier channels. Cattail (*Typha latifolia*) and tule (*Scirpus* sp.) colonized standing water, while brass buttons (*Cotula coronopifolia*) and annual beard grass (*Polypogon monspeliensis*) was more common in seasonally flooded drains. Water levels in the drains fluctuate with the season and farming activity and active maintenance of the drains prevents establishment of significant perennial vegetation.

Special status plant habitat is very limited within sections of ruderal vegetation. Very few natural habitats are present in these segments of the roadway.

Annual Grassland

Annual grassland is found most extensively in the southern section of the study area along the eastern portion of the Black Point Road and the southern end of Lakeville Highway. Grassland

species include soft chess (*Bromus hordeaceous*), medusa grass (*Taeniathrum caput-medusae*), and herbs such as cut-leaf filaree (*Erodium cicutarium*), rose clover, (*Trifolium hirtum*), and tarweed (*Holocarpha virgata*), a native summer annual. Soil and drainage characteristics of the grassland affects species composition along with the presence of grazing animals. The extensive grasslands in the southern portion of the study area are used for pasture. Within the right of way, grassland vegetation from adjacent properties occurs mostly on the top of cut slopes or as a narrow band at the toe of fill. Perennial ryegrass (*Lolium perenne*) is most common in these areas where roadside runoff, ponding at the base of slope, and the lack of grazing pressure alters the annual grassland composition. Within the annual grassland, areas that are most likely to support special status plants are naturally seasonally saturated or ponded, and adjacent to similar habitats outside the right of way.

Riparian Vegetation

Perennial waterways crossing or adjacent to the right of way support willow scrub vegetation in three locations. A east-draining stream running along the south side of Black Point Road supports native arroyo willow (*Salix lasiolepis*) and weeping willows (*Salix babylonica*) that were planted at a vineyard entry. Himalayan blackberry (*Rubus discolor*) forms thickets at the streambank and the floodplain is colonized by dense mats of Baltic rush (*Juncus balticus*) and Bermuda grass (*Cynodon dactylon*). The willow scrub vegetation of a second stream crossing under Black Point Road is protected from grazing inside the road right of way fencing. This stream drains southeast out of the steeply sloping annual grassland. Willow thickets grade into coyote bush (*Baccharis pilularis*) established on the road bank forming an extensive and locally diverse habitat.

An unnamed stream crossing under Lakeville Highway near the sewage treatment plant supports an assemblage of riparian and wetlands plants including trees such as coast live oak (*Quercus agrifolia*), California buckeye (*Aesculus californica*), and red willow (*Salix laevigata*), and shrubs including California rose (*Rosa californica*) and Himalayan blackberry (*Rubus discolor*), as well as perennial wetland herbs including rosilla (*Helenium puberulum*) and leather root (*Hoita macrostachya*). This stream channel is adjacent to emergent wetlands along the sewage treatment plant containing a marsh of tule and cattail.

The willow scrub riparian communities of the right of way survey area are not known to harbor special status plants.

Seasonal Wetlands

Seasonally ponded or saturated wetlands are found in several scattered locations along the right of way. These habitats, if adjacent to natural habitats outside the right of way, are most likely to support special status plant species. Remnants of vernal pool habitat is present within the right of way of Lakeville Highway in two locations. High terrace pools remnants are found within a vineyard complex near the southern end of Old Lakeville Road 3. These pools have several characteristic species such as coyote thistle (*Eryngium aristulatum*), popcorn flower (*Plagiobothrys bracteatus*) and spikerush (*Eleocharis macrostachya*). The adjoining habitat is disturbed with ubiquitous seasonal wetland species such as wandering speedwell (*Veronica peregrina*), hyssop loosestrife (*Lythrum hyssopifolium*), and little quaking grass (*Briza minor*)

being more predominant than vernal pool endemics in the genera *Lasthenia, Downingia, Psilocarphus,* or *Navarretia.*

Other seasonal wetland habitat that is more alkaline in composition is found along Lakeville Highway near Cannon Road and near the intersection with Black Point Road. These habitats support alkali mallow (*Malvella leprosa*), brass buttons (*Cotula coronopifolia*), semaphore grass (*Pleuropogon californicus*), and smooth goldfields (*Laasthenia glaberrima*). Saline clover (*Trifolium depauperatum* ssp. *hydrophyllum*) and alkali milk vetch (*Astragalus tener* var. *tener*) are two special-status plants that could occur in the habitat.

Salt Marsh

Salt marsh vegetation is present in two short segments of Lakeville Highway where the road bed intercepts historic Tolay Lake. The vegetation is dominated by pickleweed (*Salicornia virginica*) but grades into uplands supporting transitional habitats with saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), alkali cress (*Cressa truxillensis*), and hen fat (*Atriplex patula*). The salt marsh endemic soft bird's beak (*Cordylanthus mollis* ssp. *mollis*) is associated with similar habitats.

Horticultural Plantings

Several areas along the northern and central sections of Lakeville Highway are planted to ornamental species. A mile-long continuous stand of blue gum (*Eucalyptus globules*) trees of significant size (>24-inch trunk diameters) is a notable landscape feature. The understory of this planting is all but barren of herbaceous cover. The northern section of Lakeville Highway enters an urban/industrial landscape with lawns and ornamental plantings found on the south side of the road. Other continuous patches of landscaping in the right of way are found in small communities along Lakeville Highway, and at the intersection of SR 116. Black Point Road has plantings of sea fig (*Carpobrotus chilensis*) along the Petaluma River marina and landscaped areas at the intersection with SR 121. Other ornamentals that have been planted or have escaped to colonize the roadways include coast redwood (*Sequoia sempervirens*), French broom (*Genista monspessulana*), olive (*Olea europaea*), and pampas grass (*Cortaderia selloana*). Areas of horticultural plantings have no value as habitat for special status plants.

2.4 Animal Populations

The discussion on wildlife species is based on a review of available literature, information from the CNDDB and observations and qualitative surveys of habitats conducted by HBG biologists in 2003. Gary Deghi of HBG conducted wildlife surveys within the overall study area on May 8, 9, 14, 15, 16, 19, 20, 22, 23, 24 and 25, 2003. In addition, surveys have been conducted for two endangered species of butterfly and habitat evaluations have been completed for two special status species of amphibian. The results of the species specific site assessments and surveys are summarized in the "Special Status Species" Section 2.6.2.

A list of wildlife species observed onsite or expected to utilize the project area was developed through habitat reconnaissance, field observation, and literature sources. Supplemental information was obtained from the literature, particularly for wildlife taxa not observed during the surveys. A complete listing of the references from which information was compiled on the flora and fauna inhabiting the region is contained in the References section. Table 6 provides a

species list based on these reconnaissance level observations for reptiles, amphibians, birds, and mammals over the entire project area and species expected to occur in the study area. The table lists, by scientific and common names, wildlife species documented as existing onsite or expected to occur in the study area, and provide the scientific names of all species mentioned in the text of this section.

The habitats onsite support a variety of wildlife species. The complex of habitat types include the presence of standing water, on both a seasonal and permanent basis and which can accommodate wildlife adapted to aquatic areas, as well as extensive grasslands, with scattered trees and shrubs. The complex of habitats provide nesting, foraging and roosting sites for birds, in addition to foraging areas for mammals, reptiles, and amphibians. Riparian areas include the presence of water on both a seasonal and permanent basis and cover for animals, and may serve as migration and movement corridors for wildlife.

A number of wildlife species were observed in the study area during field reviews conducted by Gary Deghi of HBG in May and June of 2003. All species are common to abundant in the region and would be expected in the combination of grassland and wetland habitats present within the study area. Constraints associated with avian resources, including nest sites for state species of special concern and raptors (see discussion below) are shown on Figure 7. Virtually all avian species are protected under the federal Migratory Bird Treaty Act.

2.4.1 North Section

Raptors observed in the North portion of the study area included turkey vulture, northern harrier, red-tailed hawk, American kestrel, golden eagle and great-horned owl. Additional birds documented within onsite grasslands and wetlands within drainages included Canada goose, mallard, rock dove, mourning dove, Anna's hummingbird, California horned lark, loggerhead shrike, black phoebe, western kingbird, western bluebird, northern mockingbird, common raven, American crow, savannah sparrow, western meadowlark, Brewer's blackbird, red-winged blackbird, brown-headed cowbird, house finch and American goldfinch. Riparian habitats in canyons also supported potentially nesting loggerhead shrike (a state species of special concern, see further discussion below), California towhee, ash-throated flycatcher, and roosting great-horned owl. Also observed flying over this section were cliff, barn and tree swallows and killdeer. The immediately adjacent stock pond supported mallard, American coot, pied-billed grebe (with young) and ruddy duck, along with nesting red-winged blackbird. Reptiles and amphibians documented during the survey included southern alligator lizard and Pacific tree frog, as well as bullfrog (adjacent stock pond). Mammals documented in this section included Botta's pocket gopher, California ground squirrel, coyote, and mule deer.

2.4.2 West Section

Raptors observed in the West section included turkey vulture, American kestrel, and golden eagle. Additional avian species documented in this portion of the study area during spring surveys included mallard, Anna's hummingbird, barn swallow, cliff swallow, mourning dove, black phoebe, common raven, American crow, California horned lark, western meadowlark, Brewer's and red-winged blackbirds and savannah sparrow. Additional birds observed flying over the site included double-crested cormorants and Canada geese. The California horned lark

was documented as nesting in the west portion of this section, as a nest with three eggs was observed and photographed on May 16. Mammals observed included black-tailed jackrabbit.

2.4.3 Middle Section

Raptors observed in the Middle section of the study area included red-tailed hawk, northern harrier, osprey, turkey vulture and great-horned owl. A great-horned owl nest was located at the west end of the eucalyptus trees along the railroad right of way along the south boundary of the property on May 19, 2003 (see Figure 7). On this date the female great-horned owl was observed in the nest with three owlets. A red-tailed hawk nest was verified at the east end of this eucalyptus grove on May 21, 2003.

Other birds observed in the Middle section of the study area included ring-necked pheasant, barn swallow, cliff swallow, white-throated swift, Vaux's swift, killdeer, Anna's hummingbird, Allen's hummingbird, rock dove, mourning dove, black phoebe, western kingbird, California horned lark, northern mockingbird, California towhee, savannah sparrow, western meadowlark, red-winged and Brewer's blackbirds, brown-headed cowbird, house finch, American goldfinch and house sparrow. Other wildlife observed included western fence lizard, broad-footed mole, California vole, and black-tailed jackrabbit.

2.4.4 South Section

Raptors observed in the South section included nesting red-tailed hawk and great-horned owl, as well as sightings of turkey vulture, northern harrier, and osprey flying over the area. Red-tailed hawks were documented as nesting in eucalyptus trees at the extreme southwestern corner of the area (see Figure 7). The eucalyptus grove along the north boundary of this area near the railroad right of way harbored a great-horned owl nest (different owl nest than that discussed above, see Figure 8), and three owlets were observed and photographed on May 20, 2003.

Additional birds observed in the farmland and drainage ditches of the South section included mallard, ring-necked pheasant, long-billed curlew, barn swallow, cliff swallow, white-throated swift, Vaux's swift, killdeer, Anna's hummingbird, Allen's hummingbird, mourning dove, black phoebe, northern mockingbird, California horned lark, savannah sparrow, western meadowlark, red-winged and Brewer's blackbirds, house finch and American goldfinch. Additional species observed within the salt marsh at the south end of this area included snowy egret, black-crowned night-heron, gadwall, and numerous song sparrows. Flying over the site were double-crested cormorants and Caspian terns. Also observed during field surveys were western fence lizard, California ground squirrel, California vole, black-tailed jackrabbit, coyote, and mule deer (in the salt marsh).

2.4.5 Highway Rights of Way

Raptors observed flying over the highway right of way included red-tailed hawk, golden eagle and turkey vulture. No nest sites were observed along any of the roadways. Additional birds observed included barn swallow, cliff swallow, rock dove, mourning dove, western kingbird, northern mockingbird, savannah sparrow, western meadowlark, Brewer's blackbird, house finch, American gold finch and house sparrow.

2.5 Wetlands Delineation

In May and June 2003 HBG conducted onsite evaluations of the geographic extent of wetlands and other "waters of the United States" potentially subject to U.S. Army Corps of Engineers (Corps) jurisdiction. Existing land forms, vegetation, hydrology, and soil conditions were studied to identify areas that would likely contain wetland and aquatic habitats. These areas were classified using the U.S. Fish and Wildlife Service's "Classification System for Wetland and Deepwater Habitats" (Cowardin et al. 1979). The landward extent or boundary of these areas was further defined using the methodology currently in use by the Corps, published Corps regulatory guidance letters, and San Francisco District regulatory policy.

The 1987 *Corps Wetlands Delineation Manual* (1987 Manual) was used to determine the extent of wetlands at the study site. Pursuant to the 1987 Manual, key criteria for determining the presence of wetlands are:

(a) The presence of inundated or saturated soil conditions resulting from permanent or periodic inundation by ground water or surface water; and

(b) A prevalence of vegetation typically adapted for life in saturated soil conditions (i.e., hydrophytic vegetation).

Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. Positive wetland indicators of all three parameters are normally present in wetlands. The combined use of indicators of all three parameters enhances the technical accuracy, consistency, and credibility of wetland determinations. For this reason, each of the parameters is required to be present according to the 1987 Manual.

Aquatic habitats other than wetlands which are considered to be waters of the United States also were identified as part of this study. Their landward extent was defined following the definitions provided in Corps' regulations [33 CFR 328.4(a)(b) and (c)]:

(a) *Territorial Seas.* The limit of jurisdiction in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles.

(b) *Tidal Waters of the United States.* The landward limits of jurisdiction in tidal waters:
  (1) Extends to the high tide line, or
  (2) When adjacent non-tidal waters of the United States are present, the jurisdiction extends to the limits identified in (c) below.

(c) *Non-Tidal Waters of the United States.* The limits of jurisdiction in non-tidal waters:
  (1) In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or
  (2) When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands.

(3) When the water of the United States consists only of wetlands, the jurisdiction extends to the limit of the wetlands.

An aerial photograph of the site taken by Air Photo USA dated October 2002 was obtained from GIS Express. The digital orthophoto was brought into GIS software and CAD contour data were overlaid on the aerial photo.

Detailed field investigations were conducted in May and June 2003 to delineate the limits of Corps jurisdiction. A backpack-held Trimble global positioning system (GPS) unit was used to map the wetland boundaries. Once field data collection was completed, the GPS data of the wetland boundaries were overlaid on the topographic map of the project site and the acreages within the wetland polygons were calculated.

Representative sites were selected for detailed analysis of wetland indicators using a transect-based sampling approach. Site selection was based on an examination of sites that would likely pond, flood, or saturate based on their geographic position, soil permeability, and drainage characteristics in relationship to well-drained upland sites (as determined by NRCS soils data).

Wetlands potentially subject to Corps jurisdiction within the 2,082 acre study area total 360.26 acres. The delineation maps (see Figures 8 and 9) and accompanying technical report will require verification by the Corps. The report would contain all supporting information associated with the wetland delineation, including a map of jurisdictional resources on the project site and field data forms. The wetlands identified in the sections below all serve the functions of flood flow alteration, groundwater recharge, sediment stabilization, sediment/toxicant retention, nutrient removal/ transformation, production export, and wildlife habitat.

2.5.1 North Section

Areas potentially subject to the Corps' jurisdiction in the North section of the study area total 82.50 acres, including 0.95 acres within the irregularly-shaped area of the north section that comprises a portion of the 318.7 acre development site. The areas potentially subject to Corps jurisdiction include seasonal fresh water emergent wetlands, seasonal and perennial water courses, and manmade stormwater drainage and flood control ditches.

2.5.2 West Section

Areas potentially subject to the Corps' jurisdiction in the West section of the study area total 123.57 acres and include seasonal fresh water emergent wetlands and manmade stormwater drainages and flood control ditches. All but 0.96 acres of wetlands within the West section are included within the wetland acreage of the development site.

2.5.3 Middle Section

Areas potentially subject to the Corps' jurisdiction in the Middle section of the study area total 65.04 acres and include seasonal fresh water emergent wetlands, seasonal drainages and manmade stormwater drainage and flood control ditches.

2.5.4 South Section

Areas potentially subject to the Corps' jurisdiction in the South section the study area total 89.15 acres and include tidal salt marsh wetlands, seasonal fresh water emergent wetlands, seasonal drainages and manmade drainage and flood control ditches.

2.5.5 Highway Rights of Way

Areas potentially subject to Corps jurisdiction in the rights of way of roadways include seasonal wetlands, perennial and seasonal drainages and manmade roadside drainage ditches.

2.6 Special Status Species

Rare, endangered, or threatened species as well as species that are proposed for listing or candidates for listing are afforded various levels of protection under the Federal Endangered Species Act of 1973 (16 USC § 1531 *et seq.* and rules thereunder, i.e., 50 CFR §§ 17.11 and 17.12), the California Native Plant Protection Act of 1977 (Cal. Fish & Game (CFG) Code § 1900 *et seq.*), and the California Endangered Species Act of 1970 (CFG Code § 2050 *et seq.* and rules thereunder, i.e., California Code of Regulations (CCR) Title 14, §§ 670.2 and 670.51). The California Environmental Quality Act (CEQA) (January 1984) requires that the California Department of Fish and Game (CDFG) be consulted during the CEQA review process as to the impact of proposed projects on endangered and threatened species, and regulations provide additional protection for unlisted species that meet the "rare" or "endangered" criteria.

The CDFG maintains records for the distribution and known occurrences of sensitive species and habitats in the California Natural Diversity Database (CNDDB). Sensitive species include those species listed by the federal and state governments as endangered, threatened, or rare or candidate species for these lists. The CNDDB also included species that are included within the U.S. Fish and Wildlife Services (USFWS) category of species of special concern. This is an informal term that refers to those species which the USFWS believes might be declining or in need of concentrated conservation actions to prevent decline. These species receive no legal protection under the Federal Endangered Species Act. The CNDDB also includes state species of special concern designated by the CDFG because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "species of special concern" is to halt or reverse their decline by calling attention to their plight and address the issues of concern early enough to secure their long term viability. Not all "species of special concern" have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing as a "Threatened" or "Endangered" species under the State and/or Federal Endangered Species Acts, but are not listed. CDFG would consider these species during its environmental review of any proposed activities on non-trust lands.

The CNDDB is organized into map areas based on 7.5-minute topographic maps produced by the U.S. Geological Survey. All known occurrences of sensitive species and important natural communities are mapped onto the quadrangle map. The database gives further detailed information on each occurrence, including specific location of the individual, population, or habitat (if possible) and the presumed current state of the population or habitat. The project site is located in the Sears Point and Petaluma Point 7.5-minute quadrangles. A search of CNDDB records of occurrence for special status animals and plants and natural communities within these

quadrangles indicated that several special status species or natural communities are known to occur within the study area and/or in areas where potential road improvements on non-trust lands may be necessary. However, even the absence of a special animal, plant, or natural community from the report does not necessarily mean they are absent from the area in question but only that no occurrence data have been entered for that species or natural community in the CNDDB inventory. The occurrence of special status plant and animal species in the vicinity of the project area may be an indication that they also could occur in the project area. Therefore, occurrences of special status species throughout the two quadrangles mentioned above were noted in considering the potential presence of these species in the study area.

A target list of special status plants with potential to occur in the vicinity of the study area (i.e., Sears Point and Petaluma Point 7.5-minute quadrangle maps) is presented in Table 7. Table 8 presents a list of special status animals that have been reported in the project vicinity. Each species is discussed below.

2.6.1 Special Status Plant Species

A list of special status plants with potential to occur in the study area was developed from the CNDDB (2003), the USFWS Endangered Species Office, the California Native Plant Society (CNPS), and field knowledge of HBG and EcoSystems West Consulting Group staff. A complete list of special status plant species potentially occurring in the vicinity of the project area is included in Table 7.

Special-status species include species listed as Threatened or Endangered under provisions of the federal Endangered Species Act (ESA) of 1973 (16 USC 1531 *et seq.*, as amended) (U.S. Fish and Wildlife Service [USFWS] 2003a, b); and species listed as Rare, Threatened, or Endangered by the state of California under provisions of the 1984 California Endangered Species Act (CESA) and the 1977 Native Plant Protection Act (NPPA) (California Department of Fish and Game [CDFG] 2003). Species formally proposed for federal listing by the U.S. Fish and Wildlife Service (taxa for which a proposed rule has been published in the Federal Register; USFWS 2003c) are afforded limited legal protection under ESA. The Natural Heritage Division of CDFG administers the state rare species program and maintains the list of designated Endangered, Threatened, and Rare species.

Other special-status species are those on List 1A (Plants Presumed Extinct in California), List 1B (Plants Rare, Threatened, or Endangered in California and Elsewhere), or List 2 (Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere) of the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (Tibor 2001; CNPS 2003). These species are subject to state regulatory authority under the California Environmental Quality Act (CEQA) Guidelines.

Also considered as special-status species are those included on List 3 (Plants about Which We Need More Information—A Review List) and List 4 (Plants of Limited Distribution—A Watch List) of the CNPS *Inventory*. These species are considered to be of lower sensitivity, and generally do not fall under specific state or federal regulatory authority. Specific mitigation considerations are generally not required for species in these categories.

EcoSystems West botanists conducted a focused survey of literature and special-status species data bases in order to identify special-status plant species with potential to occur in the Sonoma Project study area. Sources reviewed include California Natural Diversity Data Base (CNDDB) occurrence records for the Sears Point and Petaluma Point USGS 7.5-minute quadrangles; county occurrence records and USGS quadrangle occurrence records in the CNPS *Inventory* (Tibor 2001; CNPS 2003) for the Sears Point quadrangle and the eight quadrangles surrounding it; and standard floras (Abrams 1923, 1944, 1951; Abrams and Ferris 1960; Munz and Keck 1973; Hickman 1993; Best *et al.*, 1996). Sources consulted for up-to-date agency status information include USFWS (2003a, b, c) for federally listed species and CDFG (2003) for State of California listed species. Based on information from the above sources, a target list of special-status plants with potential to occur in the vicinity of the study area was developed (Table 7).

Scientific nomenclature for plants follows Hickman (1993); Tibor (2001); and CNPS (2003). Common names follow Abrams (1923, 1944, 1951); Abrams and Ferris (1960); and Hickman (1993), except for special-status species, which follow Tibor (2001) and CNPS (2003).

Spring surveys were conducted in May and June 2003 to assess potential habitat and search for flowering special status plant species. Surveys were conducted by Roy Buck of EcoSystems West Consulting Group for the North, West and Middle sections and by Virginia Dains for the South section and relevant highway rights of way. Botanical field surveys of the study area commenced on May 16, 2003. The property was walked and all habitats were surveyed. All habitats were easily observed on foot. The timing of the survey was appropriate for identification of most of the special-status species listed in Table 7, although the survey was started late to document the presence or absence of certain early-blooming species such as Sonoma sunshine (*Blennosperma bakeri*) or dwarf downingia (*Downingia diffusis*).

Three special-status plant species were observed in the study area: Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*), alkali milk-vetch (*Astragalus tener* var. tener), and saline clover (*Trifolium depauperatum* var. *hydrophilum*). Brief discussions of each species are presented below. The observed locations of these special status plant species within the overall study area are shown on Figure 10.

In addition to these three species, an annual species of *Atriplex* was observed at several locations at the margins of seasonal pools and in low-lying areas of California annual grassland that could be San Joaquin spearscale (*Atriplex joaquiniana*). This species is listed on CNPS List 1B (Tibor 2001; CNPS 2003), and has no other federal or state status. The plants observed were in vegetative condition, and flowering or fruiting material is necessary for positive identification.

Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*)
Sonoma alopecurus was listed as Endangered by the U.S. Fish and Wildlife Service in 1997 (USFWS 1997). It is also listed on CNPS List 1B (Tibor 2001; CNPS 2003). This species is a tufted perennial grass that grows up to 75 cm. (30 in.) high, and has elongated, cylindrical flower clusters. It occurs in freshwater marshes and other more-or-less permanently wet habitats (Rubtzoff 1961; Munz and Keck 1973; USFWS 1997). It was previously known from approximately 16 historic natural populations, all in Sonoma and Marin counties, of which approximately eight are known to be extant (USFWS 1997). In addition, several attempts have

been made to artificially create populations in Point Reyes National Seashore, at least some of which have failed (USFWS 1997). Sonoma alopecurus was not previously known from the immediate vicinity of the study area. According to CNDDB records, the nearest previously known occurrence to the study area is in Ledson Marsh in Annadel State park southeast of Santa Rosa, approximately 19 miles north-northwest of the site.

In the survey area, Sonoma alopecurus was observed only in a single small population consisting of approximately 30-40 plants in an area approximately 4×4 feet, east of Lakeville Highway in the North section of the site (see Figure 10). It grows in standing water along a drainageway that is fed either by a natural spring or by leakage from a well (a windmill and water tank are located upstream) and that may have flowing water all year round. The vegetation cover at this location is dense (> 90 percent), and the principal associated species are the native species pale spike-rush, brown-headed rush, and willow dock (*Rumex salicifolius* var. *transitorius*) and the non-native species water cress (*Rorippa nasturtium-aquaticum*), Italian rye grass, annual beard grass, and bird's-foot trefoil.

Alkali milk-vetch (*Astragalus tener* var. *tener*)
Alkali milk-vetch is listed on CNPS List 1B (Tibor 2001; CNPS 2003). It has no other federal or state status. It is a small, delicate annual in the legume family, with pinnately compound leaves and pinkish-purple, pea-shaped flowers. It occurs in alkaline clay soils in seasonally moist grassland, vernal pools, and other seasonally moist habitats from Sonoma, Napa, and Solano counties south to Monterey County and east to San Joaquin and Merced counties (Munz and Keck 1973; Hickman 1993; Best et al. 1996; Tibor 2001; CNPS 2003). It was last collected in the greater San Francisco Bay Area in 1959, and was previously believed to be extirpated in Sonoma County (Tibor 2001; CNPS 2003). According to CNDDB records, the nearest previously known occurrence to the study area was somewhere in or near Petaluma, and this occurrence is known to be extirpated.

Alkali milk-vetch was found at a single location in the survey area, in the southeast corner of the Middle section, in a low-lying area of California annual grassland habitat (see Figure 10). Approximately 25 plants were observed scattered in an area approximately 50×50 feet The grassland at this location is relatively dense (90 percent cover), and associated species include the non-native species sickle grass (*Parapholis incurva*, an indicator of alkaline or saline soils), Italian rye grass, soft chess, Mediterranean barley, and mayweed, and the native species goldfields (*Lasthenia californica*).

Saline clover (*Trifolium depauperatum* var. *hydrophilum*)
Saline clover is listed on CNPS List 1B (Tibor 2001; CNPS 2003). It has no other federal or state status. It is a diminutive annual clover that, like all clovers, has tiny, pea-shaped flowers (pink-purple in this species) in heads. The banner petal becomes noticeably inflated as the flowers start to dry, giving the heads a distinctive appearance. Saline clover is distinguished from other varieties of *T. depauperatum* by its very small, but well-developed and distinctly lobed, involucre, with the lobes generally < 1 mm. long. It is often inconspicuous because it is lower-growing than much of the associated vegetation, although it becomes relatively conspicuous when it grows in dense patches. It grows in alkaline or saline soils in seasonally moist grassland, vernal pools, salt marshes, and other seasonally moist habitats from Sonoma, Napa, and Solano counties (and, possibly, Colusa County) south to San Luis Obispo County

(Munz and Keck 1973; Hickman 1993; Best et al. 1996; Tibor 2001; CNPS 2003). According to CNDDB records, the nearest previously known occurrence to the study area is approximately two miles south of the junction of Highway 121 and Highway 116, approximately 3.5 miles north-northeast of the study area.

In the study area, saline clover is relatively abundant and widespread, although patchily distributed, in a sizable area of low-lying California annual grassland habitat just north of Highway 37 in the south-central portion of the North section (see Figure 10). The microtopography in this area is nearly level but slightly undulating, and saline clover mostly occupies slight but definite depressions. Three small outlying colonies occur beyond the periphery of this area, and another relatively small colony occurs approximately 1,750 feet to the northeast. Six additional colonies of varying sizes occur in the Middle section, all occupying shallow drainageways or local depressions. Characteristic associated species include the native species alkali heath (in the largest area of occurrence), yellowbeak owl's-clover, sour clover, white-tipped clover (*Trifolium variegatum*), California semaphore grass, California oatgrass, and toad rush, and the non-native species Italian rye grass, soft chess, Mediterranean barley, six-weeks fescue, sickle grass, bur-clover, curly dock, and mayweed.

2.6.2 Special Status Animal Species

Animal species noted in the CNDDB as occurring in the Sears Point and Petaluma Point 7.5 minute quadrangle map areas, or that are known to occur in the general vicinity based on the knowledge of HBG biologists, are discussed below. Table 8 lists special status animal species that have been reported in the Sears Point and Petaluma Point USGS 7.5-minute quadrangles.

Myrtle's Silverspot Butterfly (*Speyeria zerene myrtleae*)
Myrtle's silverspot butterfly is a federally listed endangered species. This species has no special state status. A Recovery Plan for Myrtle's silverspot was published by the U.S. Fish and Wildlife Service in September 1998. Myrtle's silverspot inhabits coastal dunes, coastal scrub and coastal prairie at elevations ranging from sea level to 300 meters, and as far as 5 kilometers inland.

The historical range of Myrtle's silverspot butterfly extends from San Mateo County north to the mouth of the Russian River in Sonoma County (USFWS 1992). It was originally collected at San Mateo in 1919, but has not been seen on the San Francisco Peninsula for over 50 years. Four populations are known to inhabit coastal terrace prairie, coastal bluff scrub, and associated non-native grassland habitats in western Marin and southwestern Sonoma Counties. Two populations are located within the Sonoma State beaches in Sonoma County. A population occurs on coastal dunes in Point Reyes National Seashore in Marin County. The closest known population to the project site, according to the CNDDB, is from the 1991 documentation of the species 2 miles north of the junction of Lakeville Highway and Highway 37, approximately 0.5 mile north of the project area.

In contrast to information presented by the U.S. Fish & Wildlife Service (1992) when it recognized the Myrtle's Silverspot as an endangered species, recent taxonomic studies suggest that the subspecies *Speyeria zerene myrtleae* may be extinct. Emmel and Emmel (1998) decided that *S. zerene* populations located north of the Golden Gate Bridge were sufficiently different in appearance from those south of the bridge to be recognized as a new subspecies, *Speyeria zerene*

puntareyes. This restricted geographic range of *S. zerene myrtleae* to the San Francisco Peninsula, where it has not been seen for decades and has led to the presumption that it is extinct.

Inland populations of *S. zerene* from Sonoma County were previously recognized as the subspecies *myrtleae*. However, in 1998 Emmel, Emmel, and Mattoon (1998) determined that these interior populations represented a new subspecies, *S. zerene sonomensis*. The differences in appearance between *myrtleae, puntareyes*, and *sonomensis* are based on the ground color, degree of silver spotting, and darkness of the maculations. These features in *Speyeria* are normally quite variable, so a taxonomic determination must be based on examination of several individuals within a population to differentiate these three subspecies.

All three of these silverspots are primarily associated with grasslands. Their larval food plant is probably *Viola adunca* (Violaceae). Adults wander widely, especially to find nectar, to escape the fog that often lingers along the immediate coast, and for shelter from blustery on-shore winds. Thus, it is not unusual to find adults a few miles inland from the immediate coast, particularly in pocket meadows within forested areas, grassy swales, and other sheltered areas (Arnold, personal observation). As various introduced species of thistle (*Cirsium* and *Silybum*; Asteraceae) are favored nectar plants, adults may also be observed in disturbed areas where the thistles readily grow.

The silverspot is univoltine. The adult flight season begins in mid- to late June and continues through August, with the height of the flight season typically about mid-July. Males are conspicuous as they fly just above the grass tops incessantly searching for females. This flight behavior is often referred to as a patrolling flight. Closely related taxa are known to live as long as several weeks, so the adults of these subspecies probably have a similar lifespan.

Females lay their eggs on or near the larval food plant. After about one week, the larvae hatch from the egg, eat the eggshell, and then spin a small silken pad which shelters them throughout the remaining summer, fall, and winter months. No other feeding occurs until the following spring, when the larvae feed on the new leaves and flowers of their violet food plant. After about 4-6 weeks, they transform into a pupal stage, and the adult butterfly emerges about 2 weeks later.

The California Natural Diversity Data Base (2003) lists a record of *Speyeria zerene myrtleae* from 2 miles north of the junction of Lakeville Highway and Highway 37, which is approximately 0.5 mile north of the project area. However, this is the type locality of the new subspecies *sonomensis* and this record actually refers to specimens that are part of the type series for this new subspecies (Emmel, Emmel, and Matoon, 1998)

Potential habitat for Myrtle's silverspot butterfly occurs in the North section of the project area, as the higher elevation areas in the northeast portion of this section contain numerous colonies of *Viola pedunculata,* host plant for the species, and thistles and other plants used by the butterfly to obtain nectar. Mapping of potential habitat (colonies of *Viola pedunculata*) was conducted for most of the North section by CH2M Hill in late March 2003, and for a portion of the North section as well as the West and Middle sections of the site by HBG in mid-May 2003. Potential breeding habitat for the butterfly species is present in the North section and extends throughout much of the hillside area as shown on Figure 11.

Dr. Richard Arnold of Entomological Consulting Services, Ltd., conducted surveys for Myrtle's silverspot in the project area during the flight season of the species in early summer 2003. Myrtle's silverspot butterflies were not found in the project area. His report is presented in Appendix A.

Callippe Silverspot Butterfly (*Speyeria callippe callippe*)
Callippe silverspot butterfly is a federally listed endangered species (1997). It was recognized as endangered by the USFWS in 1997. This species has no special state status. *Speyeria callippe callippe* is a nymphalid butterfly that occurs in coastal grasslands where its larval food plant, *Viola pedunculata*, grows. Although it was formerly widely distributed throughout the San Francisco Bay area, today the butterfly is known only from San Bruno Mountain in San Mateo County, Joaquin Miller and Redwood Regional Park areas in Oakland (Arnold 1981). Populations that are somewhat intermediate between the Callippe Silverspot and a related subspecies are known from the Pleasanton and Livermore areas, plus the hills (Lake Herman to I-80) of southwestern Solano County and the American Canyon area in southeastern Napa County (Arnold 1983 and 1985). However, the USFWS treats these populations as the endangered butterfly. Even though it has not been observed there in several decades, historical records for the silverspot indicate that it formerly occurred on Twin Peaks in San Francisco. The closest population to the project area was documented in the CNDDB between 1991 and 1993, 1.5 miles north of Lakeville Highway/Highway 37 and 2 miles WNW of Sears Point. This location is approximately 0.5 mile from the boundary of the project area.

The adult flight season is usually May through mid-July. Adults are particularly fond of various thistles (especially *Cirsium* and *Silybum*), buckeye (*Aesculus*), and mint (*Monardella*) species for nectar. Adults congregate at hill tops to locate their mates. The life history information of the species is similar to that described for Myrtle's silverspot butterfly.

Potential breeding habitat for Callippe silverspot butterfly occurs throughout much of the hillside area of the North section, as this area contains colonies of the larval host plant, *Viola pedunculata*, as well as thistles and other plants to be used to obtain nectar as discussed above and as shown on Figure 11.

Dr. Richard Arnold of Entomological Consulting Services, Ltd. conducted surveys for Callippe silverspot in the project area during the flight season of the species in early summer 2003. Callippe silverspot butterflies were shown to be present in appropriate habitats in the North section of the project area. Individuals were observed within the breeding habitat shown on Figure 13, and were also observed beyond these boundaries to obtain nectar from thistles and other suitable plants. Details of Dr. Arnold's surveys are discussed in his report, presented in Appendix A.

The endangered subspecies of Callippe silverspot were observed only in the North section of the property. Although Dr. Arnold is certain breeding by the species occurs within the study area, it was apparent that many individuals came from lands that lie offsite and north of the North section. No silverspots were observed in the Middle, South, or West sections of the property.

Dr. Arnold recommended that the North section be set aside as protected habitat for the endangered Callippe silverspot.

Opler's Longhorn Moth (*Adela oplerella*)
Opler's longhorn moth is a federal species of special concern. Longhorn moths are small, day-flying moths that belong to the family Incurvariidae. Opler's longhorn moth is a small, dark brown hairy moth with a wingspan ranging from 9-14 millimeters. Descriptions of the life history and early stages of this moth are incomplete. Opler's longhorn moth completes the active portions of its life cycle during the winter – spring wet season. Adults fly, mate, and lay their eggs between mid-March and late April, depending on weather conditions. Eggs are deposited directly into the unopened flowers of the host plant, *Platystemon californicus*. A few weeks later the larvae emerge after they have consumed the developing seeds. The larvae may enter diapause during the summer and re-emerge after the winter rains to continue feeding until they are large enough to pupate. The adult host plant is not known, though it appears that the adults may feed on the nectar of *Platystemon californicus* and other native herbaceous species.

The range of Opler's longhorn moth is from Sonoma County and Marin County south to Santa Clara County, with one record for Santa Cruz County. The species is known almost exclusively from serpentine grasslands where the larvae feed on *Platystemon californicus*. Opler's longhorn moth has been documented from an area 2 miles north of Lakeville Highway/Highway 37, a location approximately 1 mile north of the north boundary of the project area. Habitat for the species may be present onsite, depending on the presence of the host plant, *Platystemon californicus*.

Steelhead Trout (*Oncorhynchus mykiss*)
Central California populations of steelhead trout (*Oncorhynchus mykiss*) were federally listed as threatened in August 1997. Steelhead have been divided into ESUs, all of which were listed as threatened under the Federal Endangered Species Act in August 1997. Steelhead in the Central Coast ESU occur from the Russian River south to Soquel Creek and to, but not including, the Pajaro River, and including San Francisco and San Pablo Bays. Steelhead require well-oxygenated streams with riffles and loose, silt-free gravel substrate for spawning.

Juvenile steelhead require a period of residency in a stream before migrating downstream to the ocean. The length of freshwater residency may vary from one to three years or more depending on the living conditions in the stream. The major downstream migration of juvenile steelhead occurs during the period from February through June, depending on the water year and pattern of winter-spring runoff. Fish habitat is physically reduced to a minimum during the low-flow period of July through October.

Steelhead make spawning runs into several rivers and small creeks flowing into San Pablo Bay. In general, adult steelhead return to rivers and creeks in the Bay region from October to April, and spawning takes place in the rivers from December to May. Juvenile steelhead can spend up to 7 years in freshwater before moving downstream as smolts during March to May, and then spend up to 3 years in saltwater before returning to freshwater to spawn. Since juvenile steelhead remain in the creeks year-round, adequate flows, suitable water temperatures and an abundant food supply are necessary throughout the year in order to sustain steelhead populations.

The most critical period is in the summer and early fall when these conditions become limiting. Steelhead runs have been known from the project area in the Petaluma River.

In addition to steelhead, the portion of San Pablo Bay near the project area is within Essential Fish Habitat (EFH) for the following species managed under the three Fishery Management Plans (FMP) under the Magnusun-Stevens Fishery Conservation and Management Act (MSA): Pacific Groundfish FMP, Coastal Pelagics FMP and Pacific Coast Salmon FMP.

Sacramento Splittail (*Pogonichthys macrolepidotus*)
The Sacramento splittail, a cyprinid fish, was removed from the federal list of threatened species on September 22, 2003. The species is a state-designated species of special concern. The Sacramento splittail is endemic to the lakes and rivers of the Central Valley, but is now found only within the Delta and Suisun Bay and associated marshes. This fish prefers slow moving river sections and dead end sloughs, and requires flooded vegetation for spawning and foraging young. The species has been known to occur (April 2001) in the restored high elevational tidal marsh of Carl's Marsh, located near the mouth of the Petaluma River south of Highway 37. The only potentially suitable habitat for Sacramento splittail in the study area is in the narrow strip of tidal marsh south of the outboard levee within the South section of the area.

California Tiger Salamander (*Ambystoma californiense*)
The Sonoma County distinct population segment of the California tiger salamander (*Ambystoma californiense*) was listed as endangered on July 22, 2002. On August 4, 2004 the California tiger salamander was listed as a threatened species throughout its range, at which time the Sonoma County population was also downgraded to threatened status. On August 19, 2005, a U.S. District Court judge ruled that there was no basis for downlisting the Sonoma County distinct population segment when the three distinct population segments were merged, and reinstated the endangered classification for the Sonoma County distinct population segment. The species is also a California species of special concern.

California tiger salamander occurs in central California from the central Sacramento Valley to the central San Joaquin Valley and surrounding foothills of both the Coast Range and the Sierra Nevada. The species also has been recorded in the San Francisco Bay area, the Monterey Bay area, and valleys and foothills in San Luis Obispo and Santa Barbara Counties. The actual occurrence of the species within this range is restricted to locations where breeding ponds are surrounded by suitable upland habitat.

Adult California tiger salamanders inhabit grassland, savanna, or deciduous oak woodland habitats which contain natural ponds, vernal pools, intermittent streams, or stock ponds. They usually are not found unless there is this combination of ponded water for breeding and surrounding upland, with a predominant ground cover of grazed or ungrazed grassland. They spend the majority of their time below ground, in rodent burrows, or other natural crevices. The major threat to the California tiger salamander is the loss of breeding pools and ponds and the conversion of upland habitat for agriculture and urban development. California tiger salamander does not appear in the CNDDB for the local area, but the species occurs in Sonoma County in habitats similar to those found in the North section of the project area.

Potential aestivation habitat is limited onsite due to a general lack of ground squirrel burrows and a very limited number of other open rodent burrows. The lack of breeding habitats in proximity to estivation habitat makes the site of only fair quality to support the California tiger salamander.

California Red-legged Frog (*Rana aurora draytonii)*
The California red-legged frog is a federally listed threatened species and California species of special concern. The historical range of the California red-legged frog extended from the vicinity of Point Reyes National Seashore in Marin County southward to northwestern Baja California, Mexico and inland to approximately Redding in Shasta County (61 *Federal Register* 25813). The geographic range of the frog has declined by 70 percent relative to its historic range. The species is known to occur on the site.

California red-legged frogs have been observed in a number of aquatic and terrestrial habitats, including marshes, streams, lakes, reservoirs, ponds and other permanent, or near permanent, sources of water. Although they occur in ephemeral streams or ponds, California red-legged frogs are expected to thrive in permanent deep-water pools with dense stands of overhanging willows (*Salix* spp.) and emergent vegetation. However, they have been observed in a variety of aquatic environments, including stock ponds and artificial pools with little to no vegetation. California red-legged frogs usually are observed near water, but can move long distances over land between water sources during the rainy season.

The North and West sections of the study area have excellent habitat characteristics for the California red-legged frog. Wetland areas with inundation sufficient to support breeding by California red-legged frog are present within these sections. Ponds within the North section serve as plunge pools; these ponds and adjacent refugial areas are shown in Figure 12. A drainage in the West section of the study area has historically supported breeding individuals of this federally-listed threatened species, and this area as well as surrounding refugial habitat is also shown in Figure 12. Potentially suitable habitat for California red-legged frog is also present in the northeast portion of the Middle section of the study area. Figure 12 shows potential breeding ponds, connecting drainages that could serve as dispersal corridors, and 300 foot buffer zones serving as refugial habitat in various parts of the study area. The setback of 300 feet was chosen for the analysis as this is the buffer zone requirement that has been used to estimate refugial areas by the USFWS.

Northern Harrier (*Circus cyaneus*)
The northern harrier, a state species of special concern with respect to nesting habitat, is found throughout lowland California. Northern harriers mostly nest in emergent wetlands, or along rivers and lakes, but may nest in grasslands. Its nests are found on the ground in shrubby vegetation, usually at the edge of marshes. The CNDDB does not include any records of nesting by the species in the project vicinity. Appropriate nesting habitat for this species is not present in the study area due to the lack of appropriate vegetation. Foraging within the study area by the species is likely, and individuals were observed in the area by HBG in May 2003.

White-tailed Kite (*Elanus caeruleus*)
White-tailed kite is a California fully protected species. The white-tailed kite is a common to uncommon year-long resident in coastal and valley lowlands, but rarely is found away from

agricultural areas. It prefers open grassland and agricultural areas and inhabits herbaceous and open stages of most habitats, mostly in cismontane California. The species has extended its range and increased its numbers in recent decades. Appropriate nesting habitat is not present within the study area, although the species likely forages on or near the area, especially during winter.

Sharp-shinned Hawk (*Accipiter striatus*)
Sharp-shinned hawk is a California species of special concern with respect to nesting habitat. These raptors are found throughout California in winter and are permanent residents in mountainous regions in the northwest and Sierra Nevada (except at high elevations). The species breeds in ponderosa pine, black oak, riparian deciduous and mixed conifer forests of the northern half of state. Many habitats are used by this raptor in winter. Appropriate nesting habitat is not present in the study area, although the species likely forages on or near the area, especially during winter.

Cooper's Hawk (*Accipiter cooperii*)
Coopers hawk is a California species of special concern with respect to nesting habitat. The species nests primarily in riparian forests dominated by deciduous species, but also nests in densely canopied forests from digger pine-oak woodland to ponderosa pine. Although specializing on small to medium sized birds, Cooper's hawk also prey on a substantial number of small mammals. They typically hunt from a perch in a tree and are associated with wooded or scrub habitat or with grasslands bordered by woody habitat. In the winter, their habitat requirements are broader than in the breeding season. Cooper's hawks forage in open woodlands. Appropriate nesting habitat is not present in the study area, although the species likely forages on or near the area, especially during winter.

Ferruginous Hawk (*Buteo regalis*)
The Ferruginous hawk is a federal species of concern and a California species of special concern. As a wintering species, Ferruginous hawks forage almost entirely over open grasslands. Ferruginous hawks require tall trees or telephone poles in which to roost and use as lookouts for prey. Suitable wintering foraging habitat occurs in the non-native grassland on the site. No Ferruginous hawks were observed foraging over the study area by HBG during 2003 surveys. Limited use of the study area as winter foraging habitat by these hawks likely occurs.

Golden Eagle (*Aquila chrysaetos*)
The golden eagle is a California species of special concern. The species has no federal status under the Endangered Species Act. However, the golden eagle is protected under the federal Bald and Golden Eagle Protection Act of 1940 (16 USC § 668) and the Migratory Bird Treaty Act (16 USC § 703 *et seq.*) (See 50 CFR §§ 10.13 and 23.23) and is a California fully protected species. Golden eagles typically frequent rolling foothills, mountain areas, sage-juniper flats and desert. Suitable foraging habitat occurs in the non-native grassland within the study area. Golden eagles were observed in the area by HBG during spring 2003 surveys. Use of the study area as foraging habitat likely occurs in both winter and summer.

Prairie Falcon (*Falco mexicanus*)

Prairie falcon is a California species of special concern with respect to nesting habitat. Prairie falcons nest in scrapes on steep cliffs, bluffs, or rock outcrops and forage for prey over open country. They may also occupy old red-tailed hawk, common raven or golden eagle nests. They prey on small mammals and birds. Habitats where prairie falcons occur include grassland, savanna, rangeland, agriculture fields and desert scrub. Appropriate nest sites are not present in the study area. Prairie falcons could occur in the area in winter.

Merlin (*Falco columbarius*)
Merlin is a California species of special concern with respect to wintering habitat. This falcon breeds in Canada in open woods or wooded prairies and winters in small numbers in a variety of California habitats, including grasslands, savannahs, and wetlands. Merlins forage along the margins of wooden habitat, including riparian strips, and woodland, chaparral, and savanna borders to grasslands. They feed mostly on small birds, although they are known to take aerial insects such as dragonflies and occasionally small mammals. A small number of individuals may pass through the study area, with incidental use of the area as a winter foraging habitat.

Burrowing Owl (*Athene cunicularia*)
Burrowing owl is both a federal and state species of special concern. Burrowing owls are small terrestrial owls commonly found in open grassland topography ranging from western Canada to portions of South America. Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation (Zarn 1974). In California, burrowing owls most commonly inhabit ground squirrel burrows (Thomsen 1971), but they also may use man-made structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement. Burrowing owls exhibit high site fidelity, reusing burrows year after year (Rich 1984, Feeney 1992). Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers during migration. Occupancy of suitable burrowing owl habitat can be verified at a site by an observation of at least one burrowing owl, or, alternatively, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance.

The California Department of Fish and Game has adopted survey protocol and mitigation guidelines as described in an October 17, 1995 Staff Report (CDFG 1995). These guidelines were based on a draft Survey Protocol and Mitigation Guidelines developed by the Burrowing Owl Consortium to meet the need for uniform standards when surveying burrowing owl populations and evaluating impacts from development projects. The California Burrowing Owl Consortium was made up of a group of biologists in the San Francisco Bay Area interested in burrowing owl conservation. The guidelines adopted by CDFG provide information on the conduct of burrowing owl surveys. If possible, the nesting season survey should be conducted during the peak of the breeding season, between April 15 and July 15. Winter surveys should be conducted between December 1 and January 31, during the period when wintering owls are most likely to be present. The guidelines indicate that it is preferable that surveys be conducted from two hours before sunset to one hour after or from one hour before to two hours after sunrise.

The CDFG guidelines assume that a site is occupied if at least one burrowing owl has been observed occupying a burrow there within the last three years. CDFG states that the following should be considered impacts to the species: (i) disturbance within 50 meters (approximately 160

ft.) which may result in harassment of owls at occupied burrows; (ii) destruction of natural and artificial burrows (culverts, concrete slabs and debris piles that provide shelter to burrowing owls); and (iii) destruction and/or degradation of foraging habitat adjacent (within 100 meters) of an occupied burrow(s). Mitigation measures, if necessary, are intended to "avoid and minimize impacts to burrowing owls at a project site and preserve habitat that will support viable owl populations." The guidelines stipulate that "mitigation actions should be carried out from September 1 to January 31 which is prior to the nesting season."

Although California ground squirrel burrows have limited distribution on the site (present only near the center of the North section and in a small area of the South section), habitat for burrowing owl is present. Burrowing owls were observed in the North section by CH2M Hill during site surveys in March 2003. Gary Deghi from HBG conducted nesting surveys for burrowing owl over the entire project area. Survey dates included May 8, 9, 14, 15, 16, 19, 20, 22, 23, 24 and 25, 2003. All surveys for nesting burrowing owl were negative. The documented location for wintering burrowing owl constitutes an "occupied burrow" according to CDFG guidelines (see location of wintering site in Figure 7).

California Clapper Rail (*Rallus longirostris obsoletus*)

The California clapper rail, a federal and state-listed endangered species, is a California fully protected species. It inhabits salt water marshes traversed by tidal sloughs in San Francisco Bay. The California clapper rail requires abundant growths of pickleweed, but does feed away from cover. These rails primarily feed on mollusks from mud-bottomed sloughs.

California clapper rails have been impacted by loss of tidal marsh bordering the San Francisco Bay, which has been reduced from 193,800 acres in 1850 to about 30,100 acres today (Dedrick, 1989). Erosion of shorelines in the East Bay, freshwater discharges from wastewater facilities, and fragmentation of tidal marshes around the Bay have further compromised habitat quality for the species. A proliferation of mammalian predators (e.g., red fox, raccoons, rats, skunks and domestic pets and feral animals) and avian predators (e.g., raptors) that hunt from transmission lines in rail habitat have had profound effects on California clapper rail populations. California clapper rail populations at San Francisco Bay were estimated at 4,200 to 6,000 birds in the mid 1970s (Gill, 1979) and had decreased to about 500 birds in 1991 (USFWS, 1996). It is now estimated that there are approximately 500 to 600 individuals in the South Bay (USFWS, 1996) and 195 to 282 pairs in the North Bay (Evens, et al., 1994).

The CNDDB showed that California clapper rail is known to occur in the project vicinity at Lower Tubbs Island and adjacent marshes. Potentially suitable habitat for the species is present on the South section of the study area in the narrow band of tidal marsh south of the outboard levee.

California Black Rail (*Laterallus jamaicensis coturniculus*)

The California black rail, a federal species of concern, a state-listed threatened species, and California fully protected species, most commonly occurs in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrush in association with pickleweed. In freshwater marsh, they are usually found in bulrush, cattails, and saltgrass. These rails typically occur in the high wetland zones near the upper limit of tidal influence. In California, the species

occurs at San Francisco Bay, the Sacramento-San Joaquin Delta, Morro Bay, the Salton Sea, and the lower Colorado River. Loss of much of the upper marsh zone around San Francisco Bay has reduced numbers considerably. The CNDDB shows presence of California black rail in salt marsh at Tubbs Island and Tolay Creek Marsh. Potentially suitable habitat for the species is present in the South section of the study area in the narrow band of tidal marsh habitat south of the outboard levee.

California Horned Lark (*Eremophila alpestris actia)*
The California horned lark is a California species of special concern. California horned lark is a common to abundant resident in open, level or rolling short-grass prairies, plains, and meadows. Grasslands and open habitat with low, sparse vegetation and surface irregularities, such as rocks, litter, and clods of soil, which provide cover, are preferred habitat for the California horned lark. Suitable foraging and nesting habitat for this species occurs in the grasslands within the study area. Flocks of California horned larks have been observed in the grassland in the West, North, Middle and South sections of the project area. The species was documented as nesting in the West section of the study area (see Figure 7), and nesting is suspected of occurring in other sections, as well.

Loggerhead Shrike (*Lanius ludovicianus*)
Loggerhead shrike is a state species of special concern. Loggerhead shrikes are resident and winter visitors in lowlands and foothills throughout California, and are rare along the coast in winter north to Mendocino County. Preferred habitat includes open areas such as desert, grasslands, and savannah. Loggerhead shrikes nest in thickly foliaged trees or tall shrubs, and forage in open habitats which contain trees, fence posts, utility poles, and other perches. Loggerhead shrikes are usually solitary birds. They feed on insects, reptiles, and small mammals, which they frequently impale on thorns and barbed wire after capturing. Suitable habitat for loggerhead shrike occurs in the grassland habitats of the study area. A pair of loggerhead shrikes observed by HBG in one of the riparian canyons of the North section is presumed to be a nesting pair (see Figure 7).

Tri-colored Blackbird (*Agelaius tricolor*)
Tri-colored blackbird nesting colonies are protected as both a federal and state species of special concern. Tri-colored blackbirds breed near freshwater, usually in emergent wetlands with tall, dense cattails or in thickets of willow, blackberry, or wild rose. Nesting colonies prefer heavy growth of cattails and tules. Tri-colored blackbirds use grasslands and agricultural lands for foraging. A nesting colony of tricolored blackbirds is documented in the CNDDB from a 1997 sighting occurring in the area of the stock pond located immediately adjacent to the North section of the study area (see Figure 7). The nesting colony was not active during May 2003 surveys. Utilization of the habitat onsite for winter foraging is also possible.

Yellow Warbler *(Dendroica petechia brewsteri)*
The yellow warbler is a California species of special concern with respect to nesting habitat. The species breeds in deciduous riparian woodlands, and is widespread during migration. The onsite riparian corridors are not of sufficient extent to support breeding yellow warbler, however, the species is expected in the area during migration, especially in fall.

Saltmarsh Common Yellowthroat (*Geothlypis trichas sinuosa*)
Saltmarsh common yellowthroat is both a federal and state species of special concern. They only are found in Marin, Napa, Sonoma, San Francisco, San Mateo, Santa Clara, and Alameda Counties. These birds require thick continuous cover down to the water surface for foraging, and tall grasses, tule patches, or willows for nesting. They generally are found in freshwater marshes in summer and salt or brackish marsh in fall and winter. The closest known breeding site is south of the study area at San Pablo Bay. Potentially suitable nesting habitat is present in the South section of the study area within patches of tules located in drainage ditches located near the tidal marsh vegetation south of the outboard levee. The species has nested at Lower Tubbs Island near the mouth of Tolay Creek. Foraging by the species within vegetated drainage ditches and in the saltmarsh vegetation fringing San Pablo Bay is possible.

Pallid Bat (*Antrozous pallidus*)
The pallid bat, a state-designated species of special concern, is found in deserts, grasslands, shrublands, woodlands and forests throughout California, except the high Sierra and the northwestern corner of the state. The species is most common in open, dry habitats with rocky areas for roosting. The pallid bat is known for its unique habitat of feeding almost entirely from the ground. Unlike most other North American bats, this species captures little, if any, prey while in flight. Its most common prey include crickets, beetles and grasshoppers. Pallid bats are very sensitive to disturbances at roost sites, and roost sites must be capable of protecting individuals from the effects of high temperatures. In 1990, pallid bats were located under the roof line of an old barn just east of Lakeville Highway, approximately 1.5 miles north of Highway 37. This barn is located just off the north edge of the study area. If this site is used for roosting by pallid bats in the future, individuals would undoubtedly use the open habitats of the study area for foraging.

Saltmarsh Harvest Mouse (*Reithrodontomys raviventris*)
The salt marsh harvest mouse is a federal and state listed endangered species, which is only found in saline emergent wetlands of San Francisco Bay and its tributaries. Densely vegetated tidal salt marsh dominated by pickleweed traditionally has been considered prime salt marsh harvest mouse habitat. Moderate salt marsh harvest mouse populations also have been found in diked marshes. The destruction of approximately 80% of the historic tidal marshes in the Bay Area has been cited as the primary cause of salt marsh harvest mouse population declines. The nearest known population is on San Pablo Bay at Lower Tubbs Island and adjacent marshes. Potentially suitable habitat for saltmarsh harvest mouse is present in the South section of the study area within the band of salt marsh habitat south of the outboard levee.

Suisun Shrew (*Sorex ornatus sinuosus*)
The Suisun shrew is designated as both a federal and state species of special concern. The Suisun shrew occurs in tidal marshes along San Pablo Bay and Suisun Bay. This shrew requires dense, low-lying cover and driftwood and other litter above the mean high tide line for nesting and foraging. Structure (growth form) of the plant community, not species composition, appears to be the determining factor in shrew occupancy. The species has occurred prior to 1952 in the vicinity of Sears Point Road. The only location where habitat conditions in the study area may be suitable to support the species is in the band of salt marsh habitat on the South section beyond the outboard levee.

2.7 Ecological Constraints

Overall ecological constraints within the 2,082-acre study area include the following:

- Potential habitat for federally listed endangered Myrtle's silverspot butterfly and the Callippe silverspot butterfly (documented as occurring on the site) within the North section of the study area.

- Potential habitat for federally-listed threatened California red-legged frog within the North and West sections and the northeast corner of the Middle section. Included are breeding, refugial and dispersal habitats north of Highway 37 (both west and east of Lakeville Highway), and potential breeding habitat with associated refugial habitat in the Middle section.

- Locations of rare plant populations (Sonoma alopecurus, saline clover, and alkali milk-vetch) in the North and Middle sections of the site.

- Avian resources constraints including nesting and/or wintering sites for state species of special concern (including burrowing owl, loggerhead shrike, California horned lark and tricolored blackbird) in the North section, California horned lark in the West section, and locations of all known raptor nests (red-tailed hawk and great-horned owl) along the borders of the Middle and South sections.

- Wetlands and waters of the U.S. potentially subject to jurisdiction of the Corps which are present in all four sections of the site.

Figure 13 shows ecological constraints specifically related to the 318.7-acre development site. Constraints within this area include 123.56 acres of wetlands potentially subject to Corps jurisdiction, habitat for the federally-listed threatened California red-legged frog, and a known nesting location for California horned lark.

3.0 Regulations and Permit Requirements

Portions of the project on trust lands will not be subject to State or local requirements. Portions of the project on non-trust lands (e.g., State or county road improvements) will be subject to applicable State and local laws and regulations. A brief discussion of potentially applicable federal, state and local statutory/regulatory requirements follows.

3.1 U.S. Army Corps of Engineers

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material to wetlands and other waters of the United States. The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency are responsible for implementing this program. Section 404(a) authorizes the Corps to issue permits, after notice and opportunity for comment, for discharges of dredged or fill material into waters of United States. Section 404(b) requires that the Corps issue permits in compliance with EPA guidelines, which are known as the Section 404(b)(1) guidelines. Specifically, the Section 404(b)(1) guidelines require that the Corps only authorize the "least environmentally damaging practicable alternative" (LEDPA) and include all practicable measures to avoid and minimize impacts to the aquatic ecosystem. The guidelines also prohibit discharges that would cause significant degradation of the aquatic environment or violate state water quality standards.

EPA and Corps regulations define wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" [40 CFR §230.3(t); 33 CFR §328.3(b)].

Based on investigations of the project site, HBG has determined that the site contains wetlands. Accordingly, the proposed project will likely require a Section 404 permit from the Corps. Following the recent U.S. Supreme Court decision in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, No. 99-1178 (2001),* some isolated wetlands may be excluded from the Corps' Section 404 jurisdiction because they are (1) non-tidal, (2) non-navigable, (3) not hydrologically connected to navigable waters or adjacent to such waters, and (4) not subject to foreign or interstate commerce. Wetlands on the project site were reviewed to determine whether they may, as isolated wetlands, be beyond the Corps' jurisdiction as isolated wetlands. It was determined that wetlands on the property do not qualify for exclusion from Corps jurisdiction based on the *Solid Waste Agency of Northern Cook County* decision.

3.2 U.S. Environmental Protection Agency

Although the Corps is the principal permitting authority under Clean Water Act 404, EPA has review and potential veto authority over proposed Corps permits. EPA comments on project compliance with the 404(b)(1) guidelines during the public notice process and may elevate Corps permit decisions if they do not comply with the guidelines. Section 404(c) authorizes the EPA to veto a Corps decision to issue a permit of that discharge that "will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishing areas." EPA would also be the agency in charge of any required 401 Water Quality Certification review on trust lands.

3.3 U.S. Fish & Wildlife Service

The USFWS is responsible for implementing the Federal Endangered Species Act (ESA), as applied to species under the Service's jurisdiction. The purpose of the ESA is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved" (16 USC 1531). The ESA establishes an official listing process for plants and animals considered to be in danger of extinction; requires development of specific plans of action for the recovery of listed species; and generally prohibits activities that harm or kill listed species (16 USC 1532, 1538).

The ESA also establishes procedural and substantive requirements for federal agencies when their actions may affect listed species or adversely affect designated critical habitat. When this is the case, federal action agencies must consult with the USFWS or the National Marine Fisheries Service (NMFS or NOAA Fisheries Service) or both to insure that their actions do not jeopardize the continued existence of listed species or adversely modify critical habitat (16 USC 1536). Therefore, the ESA consultation requirement is triggered when the property contains a federally listed threatened or endangered species or designated critical habitat that may be affected by a federal permit decision. In the event that listed species or designated critical habitat are involved and a Corps permit is required for impacts to jurisdictional waters, the Corps must initiate consultation with USFWS (or NMFS) pursuant to Section 7 of the ESA (16 USC 1536; 40 CFR Part 402). If "formal consultation" is required, USFWS or NMFS will issue a biological opinion stating whether the permit action is likely to jeopardize the continued existence of the listed species, recommend reasonable and prudent measures (RPMs) to minimize the impact of take on listed species and identify terms and conditions to effect the RPMs, establishing terms and conditions under which the project may proceed, and authorizing incidental take of the species. If NMFS or USFWS determine that the action would jeopardize the continued existence of a listed species, they would then identify reasonable and prudent alternatives that must be implemented to avoid such a result. In the case of species proposed for listing, a "conference" must be completed if the action is likely to jeopardize the continued existence of a listed species.

The USFWS also has responsibility for project review of federal actions under the Fish and Wildlife Coordination Act. This statute requires that all federal agencies consult with USFWS, NMFS, and the state's wildlife agency (CDFG) for activities that affect, control, or modify streams and other water bodies. Under the authority of the Fish and Wildlife Coordination Act, USFWS, NMFS, and CDFG review applications for permits issued under Section 404 and provide comments to the Corps about potential environmental impacts.

The USFWS also has enforcement authority under the Migratory Bird Treat Act (MBTA) of 1918. The MBTA protects virtually all migratory birds. Under this federal statute it is unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 C.F.R. Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21). "Take" under the MBTA is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities." A take does not include habitat destruction or alteration, as long as there is not a direct taking of birds, nests, eggs, or parts thereof.

To avoid violation of the take provisions of the ESA or MBTA generally requires that project-related disturbance at active nesting sites be reduced or eliminated during the nesting cycle. Disturbance that kills eggs or young or causes abandonment and death of eggs or young may be considered "take" and is potentially punishable by fines and/or imprisonment.

3.4 California Department of Fish & Game

Portions of the project not on tribal trust land (e.g., road improvements) will be under the jurisdiction of the California Department of Fish and Game (in addition to the relevant federal agencies). CDFG regulates activities that use materials from any streambeds; or divert, obstruct, or change the natural flow or bed of any river, stream or lake under Fish and Game Code Sections 1601 – 1603.

Sections 1601-1603 allow CDFG to review any proposed construction and to propose reasonable modifications for the protection of a fish or game resource that might be substantially adversely affected by such construction. CDFG enters into a Streambed Alteration Agreement with a project applicant and may propose conditions on the agreement to prevent adverse impacts to fish and wildlife resources and ensure no net loss of wetlands. If mutual agreement between the CDFG and the affected agency is not reached, resolution on the agreement is reached through an arbitration procedure to be completed prior to construction of the proposed project.

In 1984, the State enacted the California Endangered Species Act (CESA) (Fish and Game Code section 2050). CESA is very similar to the federal ESA. The basic policy of CESA is to conserve and enhance endangered species and their habitats. CESA generally prohibits the "take" of species listed as threatened or endangered (CFG Code § 2080). CEQA also directs all State lead agencies (as defined under CEQA) to consult in writing with the CDFG to determine the impacts of a project on the continued existence of any endangered or threatened species pursuant to section 2090 of the CFG Code. However, section 2090 has been repealed. Because CESA more narrowly defines "take" CDFG considerations pursuant to CESA are typically limited to those actions that would result in the direct take of a listed species. If a proposed project would result in "take" of a State-listed species, an incidental take permit pursuant to section 2081 or authorization under section 2080.1 of the Fish and Game Code is necessary. State and Federal incidental take permits are issued on a discretionary basis and are typically authorized if the impacts of take can be minimized and the proposed impacts would not jeopardize the continued existence of the listed species. In addition to its authority under CESA, CDFG has the authority to protect avian species under Sections 3505, 3503.5, and 3800 of the California Fish and Game Code, which prohibits the take, possession, or destruction of birds, their nests or eggs, including raptor species.

As described above, under authority of the federal Fish and Wildlife Coordination Act, CDFG may review applications for permits issued under Section 404 and provide comments to the Corps regarding environmental impacts. In addition, Fish and Game Code Section 5650(a)(6) states that ". . . it is unlawful to deposit in, or permit to pass into, or place where it can pass into the waters of this state . . . any substance or material deleterious to fish, plant life, or bird life."

3.5 San Francisco Bay Regional Water Quality Control Board

Section 401 of the Clean Water Act requires that applicants for federal permits that may result in a discharge into navigable water to obtain a certification from the state agency with jurisdiction over such navigable waters that such discharge will comply with applicable state water quality standards. Corps Section 404 permits may not be issued until the Section 401 certification is either granted, or waived by the Regional Water Quality Control Board.

Portions of the project not on tribal trust land (e.g., road improvements) will be under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board which is located in Oakland, California. The Regional Board also regulates discharges of dredged or fill material to wetlands (including isolated wetlands) pursuant to the Porter-Cologne Act. Portions of the project on tribal trust lands will be reviewed by EPA for compliance with water quality standards.

In 1972, the Clean Water Act was amended so as to prohibit the discharge of pollutants to waters of the United States from any point source unless the discharge is authorized by and in compliance with a National Pollution Discharge Elimination System (NPDES) permit. The 1987 CWA amendments established a framework for regulating municipal, industrial, and construction-related storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that establish storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water from construction projects that encompass 5 or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. The California State Water Resource Control Board has developed a general construction storm water permit to implement this requirement. The permit requires submittal of a Notice of Intent to comply, fees, and the implementation of a Storm Water Pollution Prevention Plan. The proposed project would likely be required to comply with this state requirement on non-trust land, and would be required to comply with federal NPDES regulations through the EPA on trust land.

4.0 Impacts

4.1 Standards of Significance

The project would be considered to have a significant impact on biological resources if it 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 (on non-trust land) 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 (on non-trust land) or US 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 the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (on non-trust land).

4.2 Project Description

The project proposes development on approximately 175 acres out of the 318.7-acre development site. All development is proposed to take place within the West section of the study area, west of Lakeville Highway. Development would occur under one of two possible scenarios that have an equivalent development footprint, and differ in the arrangement of parking areas and internal access. The development plans for Scenario 1 and Scenario 2 development are shown in Figures 14 and 15, respectively. An area of 1,763 acres of the larger study area will be preserved as the option to purchase this area was donated by Station Casinos to the Sonoma Land Trust to be managed as open space into perpetuity. This area includes the entirety of the South and Middle sections, and most of the North section.

4.3 Impacts to Plant Communities and Wetlands

Impacts to biological resources within the development site in the West section of the study area will result from vegetation removal due to the conversion of upland areas composed of annual grassland, and due to the filling of wetland areas to accommodate proposed development. The acreage of each of the vegetation communities found on the property, and impacts resulting from implementation of the proposed development plan, is shown in Table A. The development is expected to have a footprint of 175.1 acres under either development scenario. The development would, therefore, impact 175.1 acres of habitat, consisting of 101.41 acres of California annual

grassland, 73.33 acres of freshwater marsh wetlands, and 0.36 acres of wetlands found within drainages. An overlay of the Scenario 1 development footprint with vegetation communities found on the project site is shown on Figure 16. An overlay of the Scenario 2 development footprint with vegetation communities found on the project site is shown in Figure 17.

Table A. Impacts to Vegetation Communities from Development Scenarios

Vegetation Community	Existing Acreage	Vegetation Community Impacts-Scenario 1 (acres)	Vegetation Community Impacts-Scenario 2 (acres)
California annual grassland	195.14	101.4	101.4
Freshwater marsh (wetland)	122.75	73.33	73.33
Drainages	0.81	0.36	0.36
TOTAL	**318.7**	**175.1**	**175.1**

Impacts to the annual grassland areas are not considered significant due to the prevalence of these habitat types in the region.

A total of 73.69 acres of wetlands and waters of the U.S. potentially subject to Corps jurisdiction will be filled to accommodate the proposed development under either development scenario, with consequent loss of the function provided by these areas unless mitigated. Wetlands impacts would occur within 73.33 acres of palustrine emergent seasonal wetlands, and an additional 0.36 acres of impacts would occur within the 0.36 acres found within an on-site drainage. An overlay of Scenario 1 development with the potential jurisdictional wetlands is shown in Figure 18, and an overlay with Scenario 2 development is shown in Figure 19.

At a mitigation ratio of 2:1 (two acres of wetland creation to compensate for each acre impacted) a wetland mitigation consisting of 147.38 acres of wetlands created within an open space preserve subject to conservation easements would be necessary to replace wetland acreage and associated functions. It would also significantly increase the amount of wetland in the project area and the region.

An additional impact is that project landscaping is also expected to introduce exotic, non-native vegetation, some of which may not exist in the area.

4.4 Impacts to Animal Populations

Loss of vegetation and associated habitats associated with any of the possible scenarios discussed above will displace existing wildlife within the West section of the study area. Some bird roosting, nesting, and foraging areas will be eliminated. Reptiles, amphibians, and small mammals that utilize these areas will be displaced to remaining undisturbed areas. Given that a significant area of approximately 1,763 acres of the larger study area will be preserved and managed as open space into perpetuity (the option to purchase this area was donated by Station Casinos to the Sonoma Land Trust), significant animal habitats within open space would occur nearby and impacts to most animal species would be minor. Nevertheless, some terrestrial wildlife may be impacted during construction activities. In terms of common species, any loss that occurs would not be considered significant. Special status species are discussed below.

Animal species that have adapted to living in close association with human disturbance can be expected to increase within and near the West section of the study area after construction of the proposed project. These species include mammals such as raccoon, California ground squirrel, deer mouse, and house mouse, and birds such as rock dove, mourning dove, Western scrub-jay, American robin, European starling, house sparrow, Brewer's blackbird, brown-headed cowbird, house finch, and California towhee.

Nesting bird species protected by the federal Migratory Bird Treaty Act could be impacted during project construction. The removal of trees and shrubs during the February 1 to August 1 breeding season could result in mortality of nesting avian species if they are present. Nesting red-tailed hawks and great-horned owls in and near the Middle section of the study area would be protected within open space areas and would remain unaffected by development of the project.

Nightime lighting associated with the proposed facility, including parking lot lighting, can have a a potentially significant impact on migrating and local bird populations. Increased lighting has been shown to increase collisions of birds and structures, as well as causing a disorientation effect on species.

Grading, placement of fill material and other ground-disturbing activities could promote erosion and allow elevated levels of sediment to wash into on-site wetlands and riparian areas where potential impacts to fish and wildlife species would be possible. In the absence of water quality controls, indirect impacts to animal populations in wetlands and other aquatic habitats could result from the proposed project due to elevated contaminants in stormwater runoff. However, the requirement for construction mitigation that includes the implementation of a Stormwater Pollution Prevention Plan and proper construction techniques and Best Management Practices (BMPs), will minimize adverse effects associated with these activities. Furthermore, standard techniques to control contaminants in stormwater such as oil and grease traps will be employed to further mitigate water quality concerns.

Subsequent to site development, indirect impacts to animal populations in wetlands and other aquatic habitats could result from the proposed project. These include disturbances to wildlife from people visiting the project, vehicles, pets, etc. Development setbacks would need to be established from preserved sensitive areas. Over the long term, fencing or signage may be required to restrict access to preserved sensitive areas, and means to lessen intrusion of pets (e.g., enforcement of leash laws) may be necessary.

4.5 Special Status Species

Special status species present in the project area and possibly in the area of potential roadway improvements include species with designations under both federal and state law. Mitigation measures are required for federally protected species on both tribal lands and within other areas evaluated that are not tribal-owned. Impacts to state-designated species of special concern that occur on trust land do not require mitigation. Therefore no mitigation measures are proposed for impacts to these species on trust land.

4.5.1 Special Status Plant Species

The three special status plant species known to occur on the project site would not be affected by development under either Scenario within the West section of the site. As shown in Figure 10, Sonoma alopecurus has been documented as occurring in the North section of the site, saline clover has been documented as occurring on the site in the North and Middle sections of the site, and alkali milk-vetch has been documented as occurring on the site in the southeast portion of the Middle section. No impacts to any of these species would be anticipated under the development scenarios. Systematic rare plant surveys of the project site are planned for the early spring flowering period to document presence or absence of early blooming species (e.g., Sonoma Sunshine, dwarf downingia) that may have been missed due to the timing of commencement of studies for this biological assessment.

4.5.2 Special Status Animal Species

A review of habitat requirements of sensitive species documented by the CNDDB as occurring in the Sears Point and Petaluma Point 7.5 minute quadrangles, and sensitive species known to occur in the general vicinity, was conducted by HBG biologists. The federally-listed threatened California red-legged frog is known to occur within the West section (development portion) of the site. Another listed species, the federally-listed endangered Callippe silverspot butterfly, occurs within the larger study area in area that is expected to be preserved as open space into perpetuity. The federally-listed endangered California tiger salamander is not expected to utilize the site because aestivation habitats are limited. Other species of special concern are present or possible as described below.

Myrtle's Silverspot Butterfly

Surveys conducted in 2003 concluded that Myrtle's silverspot butterflies are not present in the study area, although the USFWS could consider all areas where *Viola* occurs within the North section of the site as habitat for this species. Potential habitat for this species does not occur within the development site in the West section of the project area. Development as planned under either Scenario 1 or 2 would not impact this species.

Callippe Silverspot Butterfly

Any habitat modification to Callippe silverspot habitat that actually results in death or injury to this species would be considered "take" by the USFWS and would require incidental take authorization under the Endangered Species Act. Surveys conducted in 2003 concluded that Callipe silverspot butterflies are present in areas of suitable habitat in the North section of the site. Because populations of Callippe Silverspot are federally-listed as endangered, the USFWS will likely place strong emphasis on avoidance of significant habitat impacts. The USFWS is likely to consider all areas where *Viola* occurs in the North section of the study area as habitat for this species. Potential habitat for this species does not occur within the development site in the West section of the project area. Development as planned under either Scenario 1 or 2 would not impact this species.

Steelhead Trout

In general wastewater discharges into streams can affect steelhead through higher creek temperatures, eutrophication and possible feminization of fish from endocrines in the wastewater. One of the options for development of the Lakeville site would discharge to a

tributary of the Petaluma River during the wet season. Discharges of tertiarily treated wastewater into a tributary of the Petaluma River in the winter months would not be expected to significantly impact populations of salmonid fish or fish covered under the MSA. Impacts to steelhead would be considered insignificant due to discharge requirements of EPA and the negligible loading of effluent resulting from the project. Nevertheless, the applicant will work with the Corps and NOAA Fisheries to verify this finding within the context of an anticipated Section 7 consultation for this project.

The project development site itself is not located in the vicinity of a creek or river known to be used for spawning by steelhead. Migrating individuals could pass by the South portion of the site, which is adjacent to and separated by levees from San Pablo Bay. However, no development is planned in this portion of the project area, and indirect impacts associated with alterations in the quality of water draining to the Bay are not anticipated. Implementation of a project construction Stormwater Pollution Prevention Plan (SWPPP) and post–construction Stormwater Management Plans will minimize the potential for pollutant discharge and mitigate the potential for adverse impacts to these species.

California Red-legged Frog

Suitable breeding, refugial and dispersal habitat for California red-legged frogs in the West section of the study area would be directly impacted by development of the proposed facility under either of the development scenarios, and indirect impacts to some of the habitat present within the North section of the site near Lakeville Highway are possible. Grading within the development footprint for either development scenario would result in direct impacts California red-legged frog habitat. Impacts would result from fill placed within 0.12 acres of known breeding habitat for the species within the drainage ditch west of Lakeville Highway. Additional fill would be placed within an additional 2.24 acres of wetlands that serve as potential breeding ponds for the species, and within a separate small drainge of 0.01 acres serving as a dispersal corridor. An additional 33.2 acres of upland refugial habitat (defined as all upland areas impacted within 300 feet of known or potential breeding areas for the species) would be impacted as well.

Existing potential habitats for this species within the remainder of the North section of the study area and at the east end of the Middle section of the study area would remain in open space areas into perpetuity. These areas would not be impacted by development and the long-term conservation value of such property would be improved. A significant mitigation program would need to be developed with the U.S. Fish and Wildlife Service that would consist of means to lessen impacts to individuals of the species during construction and plans to compensate for loss of both breeding and refugial, as well as dispersal habitats. Such a mitigation program would be developed as part of a Section 7 consultation that would be necessary with the U.S. Fish and Wildlife Service during the process of obtaining a Corps permit for the project.

California Tiger Salamander

It is not likely that California tiger salamander occurs on the site. The only remotely suitable habitat is found in the North section which would be set aside as a project open space preserve and, if so, would not be impacted by development. The long-term conservation value of such property would be improved. Impacts to California tiger salamander would not occur.

Burrowing Owl
Burrowing owls were not observed in the West portion of the site during both winter and spring nesting surveys of the property in 2003. Impacts to burrowing owls are not likely due to development under either of the development scenarios. A pre-construction survey conducted of the area could determine if individuals of this species would be in harms way during construction activities. Any burrowing owls that may be present could be relocated from the area during non-nesting seasons. A burrowing owl wintering site (see Figure 7) documented in the North section of the study area (during 2003 the owls wintering at this site did not stay to nest) would be included within areas planned as open space preserve.

Avian Species of Special Concern
The State of California designates several raptor species with a potential to occur on the site as species of special concern based on the presence of nesting habitat. These species include northern harrier, white-tailed kite, sharp-shinned hawk, Cooper's hawk, golden eagle and prairie falcon. Winter use of the site by these species is expected, however, in all cases, appropriate nesting habitat appears not to be present. Three raptors that could occur are designated as species of concern based on presence of wintering habitat (ferruginous hawk, golden eagle, and merlin). Of these species, golden eagles were observed during the nesting season in May 2003 foraging over the development portion of the study area. All of the species mentioned are wide-ranging species often wintering over a broad area, and incidental use of the site by these species primarily in winter is certainly possible. The site, however, provides no unique features that would highlight the importance of the site as a wintering location for any of these species.

Two other species of special concern were observed within the broader study area in May 2003: California horned lark and loggerhead shrike. California horned lark was documented as a nesting species in the West section, and if nesting were to occur in the same area during construction, impacts to the nesting birds could be possible. Although loggerhead shrike was noted as a probable nesting species in a riparian canyon of the North section of the study area, this species was not observed at the development site during either winter or spring surveys of the area. Preconstruction surveys of the development site should be conducted to determine if nesting by California horned lark is occurring, and if nests of either species are found, it would be prudent to devise a construction plan that would allow successful nesting.

4.6 Permit Requirements

The project will likely require authorization from the Army Corps of Engineers under Section 404 of the Clean Water Act. The project also will likely require Section 401 water quality certification from the SFBRWQCB for jurisdictional impacts on non-trust land and from EPA on trust lands. Mitigation of wetlands will be required to obtain Corps and RWQCB approval. A Section 7 consultation with USFWS pertaining to potential impacts to federally-listed species, most notably the federally listed threatened California red-legged frog, will be required. To the extent that the proposed project may adversely affect fish species managed under a Fishery Management Plan of the Pacific Fishery Management Council or "Essential Fish Habitat," consultation would also be required with NMFS. Based on findings to date, it is unlikely that consultation with NMFS would be required for the project.

Coordination and permit authorization (a Streambed Alteration Agreement) from the CDFG will be required under Section 1603 of the California Fish and Game Code for any work that may take place within drainages on non-trust lands. An NPDES permit will be required for storm water discharges from the SFBRWQCB on non-trust land, and from the EPA on trust land.

5.0 Mitigation Measures

Impacts to special biological resources are usually mitigated by preserving, creating, restoring, or enhancing similar resources within the project area at specifications determined through negotiations with state and federal resource agencies having jurisdiction over those resources. Although such consultations have not taken place as of this writing, the following section presents suggested conceptual mitigation measures which subsequently will be refined as agency coordination proceeds. Although not specifically required under a Section 7 consultation, mitigation is recommended below for species proposed for federal listing and for federal species of concern, in the event that these species later become listed. Mitigation for state species of concern applies to non-trust land.

To minimize biological impacts on the project site, the following mitigation measures are recommended:

5.1 Wetlands

- For impacts to wetlands or other waters of the United States, or waters of the state on non-trust lands, authorization from the Corps and RWQCB (for non-trust lands) will be required. Appropriate wetland mitigation will be required by the Corps and RWQCB to compensate for onsite impacts to wetlands under federal or state jurisdiction. The developer will need to apply for a permit from the Corps, the 401 water quality certification from the SFBRWQCB and/or EPA and a Streambed Alteration Agreement from CDFG (again, for non-trust lands).

- A wetland mitigation plan to mitigate impacts to jurisdictional wetlands should be developed as part of the Corps and RWQCB (where applicable) permit process. Wetland mitigation would be accomplished through wetland creation within an open space preserve subject to conservation easements. Such compensation would be necessary to replace wetland acreage and associated functions. It would also significantly increase the amount of wetland in the project area and the region.

- A detailed mitigation plan will be designed that will include monitoring and reporting requirements, responsibilities, performance success criteria, reporting procedures and contingency requirements.

5.2 Animal Populations

- If feasible, construction work should take place outside of the February 1 to August 1 breeding window for nesting birds. If construction is to be conducted during the breeding season, a qualified biologist should conduct a pre-construction breeding bird survey in areas of suitable habitat within 30 days prior to the onset of construction activity. If bird nests are found, appropriate buffer zones should be established around all active nests to protect nesting adults and their young from construction disturbance. Size of buffer zones should be determined in consultation with wildlife agency staff based on site conditions and species involved.

- To mitigate the potential impacts associated with night lighting at the facility, the operator of the facility should turn off as many exterior lights as possible during the peak bird migration hours of midnight to dawn to reduce potential building collisions with migrating birds and should install downcast lights with top and side shields to reduce upward and sideways illumination to prevent spillover of excess lighting into habitat areas.

5.3 Sensitive Species

- Issues related to direct impacts on breeding, refugial and dispersal habitat for the California red-legged frog shall be considered within the context of a Section 7 consultation with the U.S. Fish and Wildlife Service as part of the process of obtaining a wetland fill permit from the Corps. Reasonable and prudent measures will need to be developed to address impacts to individuals of the species during construction and to include plans to compensate for loss of breeding, refugial and dispersal habitats.

- The applicant should work with the Corps and NOAA Fisheries within the context of a Section 7 consultation to verify a finding of no adverse effect from the wastewater discharges on populations of steelhead in the Petaluma River.

- Systematic rare plant surveys of the project site should be conducted during the early spring flowering period to document presence or absence of early blooming species (e.g., Sonoma Sunshine, dwarf downingia) that may have been missed due to the timing of commencement of studies for this biological assessment (field work was conducted between May and July 2003). Additional systematic rare plant survey should be scheduled for late March or April.

- A preconstruction survey for burrowing owl should be conducted to ensure impacts to burrowing owls, if present in the construction area, do not occur during either the nesting season or winter months. Preconstruction surveys should be conducted within 30 days of initiation of construction activity. The presence of burrowing owl nest would require mitigation to ensure all individuals remain out of harms way.

- A preconstruction survey for California horned lark should be conducted to determine if nesting by the species is occurring at the development site, and to ensure that impacts to individuals of the species do not occur during the nesting season. Preconstruction surveys should be conducted within 30 days of initiation of construction activity. The presence of nests could require delay of construction until the young have fledged.

5.4 Construction

- During construction, vegetation should only be cleared from the permitted construction footprint and necessary laydown and assembly areas. Areas cleared of vegetation, pavement, or other substrates should be stabilized as quickly as possible

and best management practices (erosion fencing, straw and other material applied to soils) to prevent erosion and runoff.

5.5 Landscaping

- Where appropriate, vegetation removed as a result of project activities should be replaced with native species which are of value to local wildlife. Native plants have significant cultural value, are generally more valuable as wildlife food sources and require less irrigation, fertilizers, and pesticides than exotic species.

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Figures

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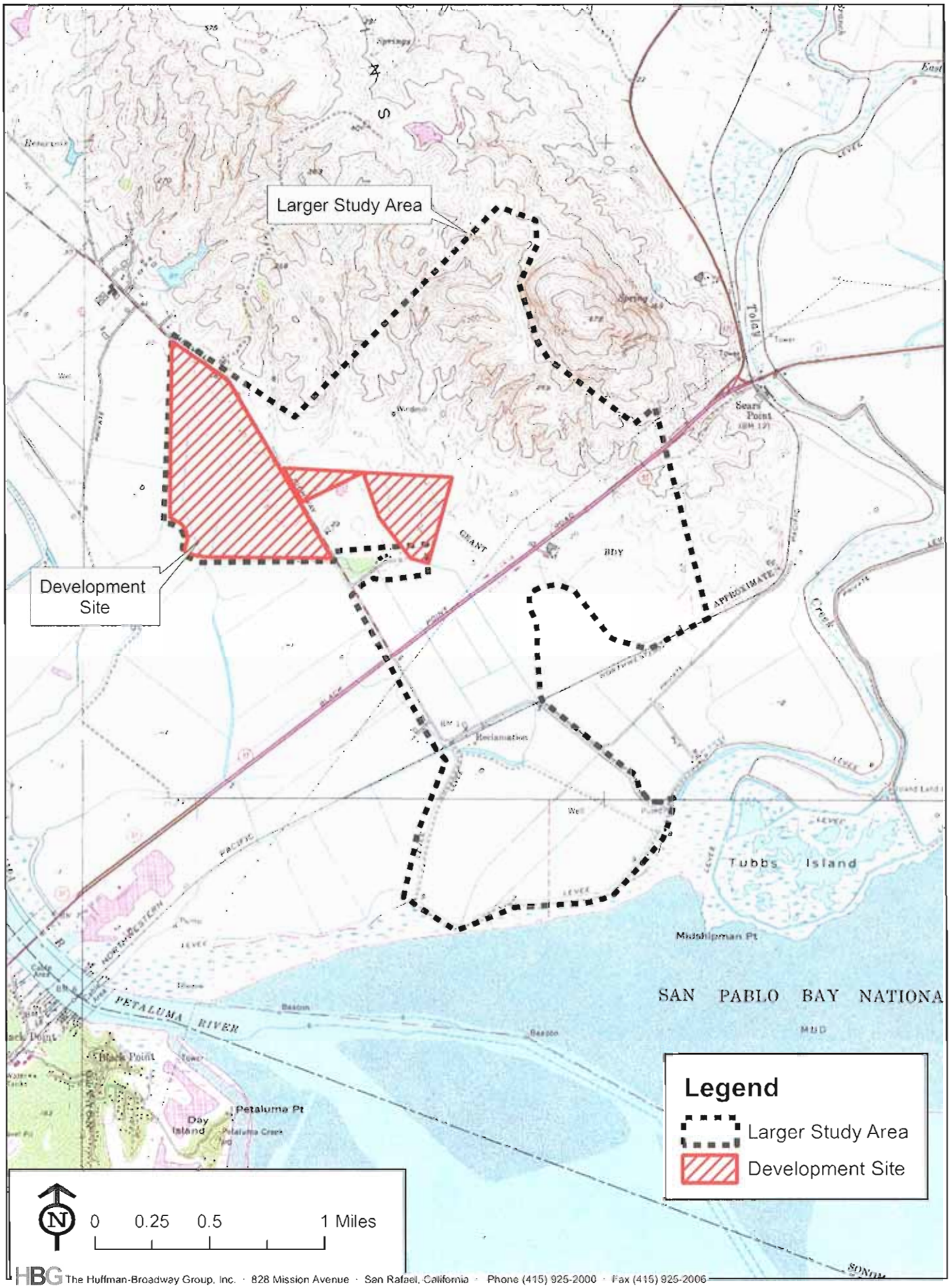

Figure 1. Location of the Development Site and the Larger Study Area

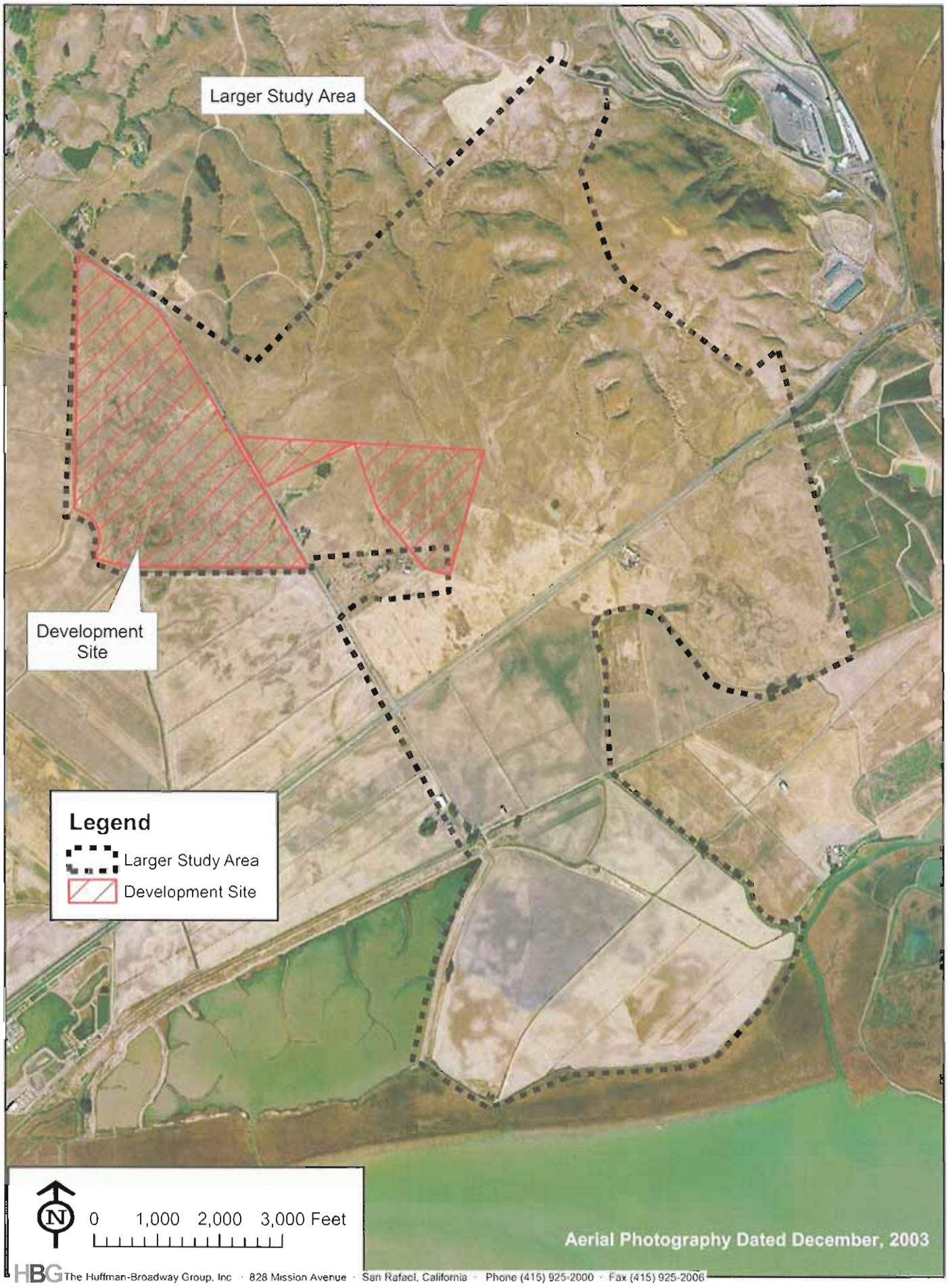

Figure 2. Aerial Photograph of the Study Area

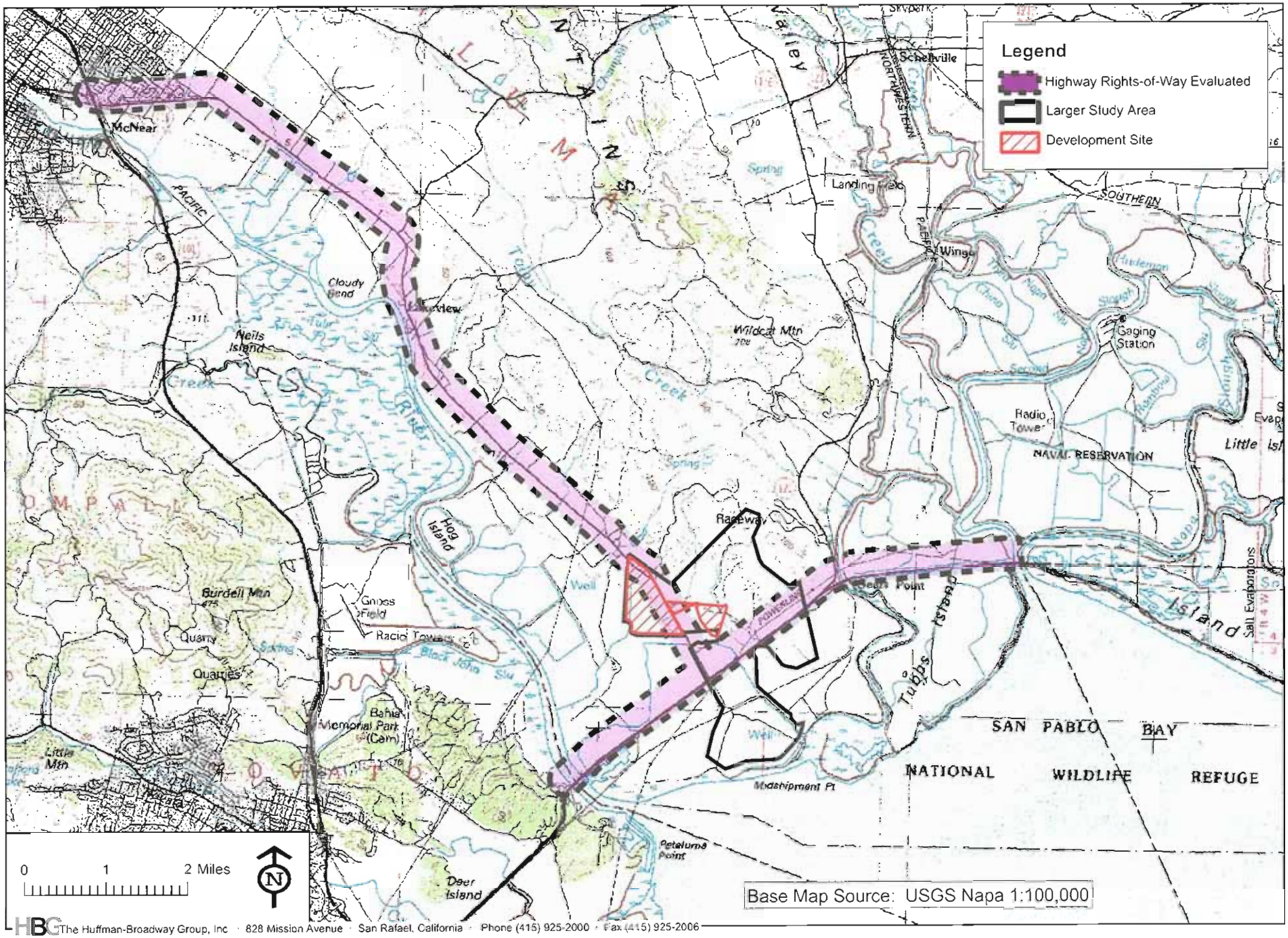

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Figure 3. Location of Rights-of-Way Evaluated

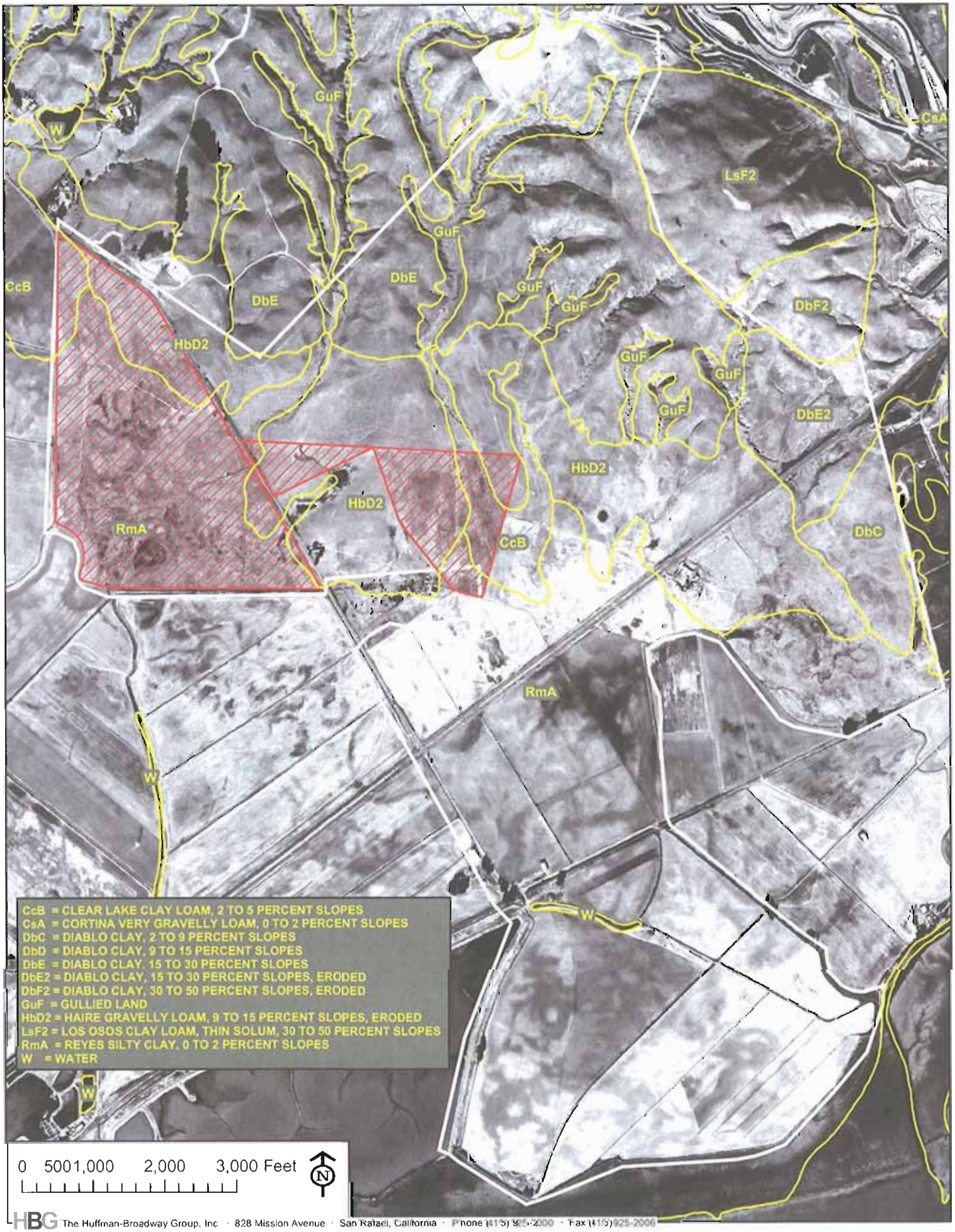

Figure 4. Soil Map of Project Site

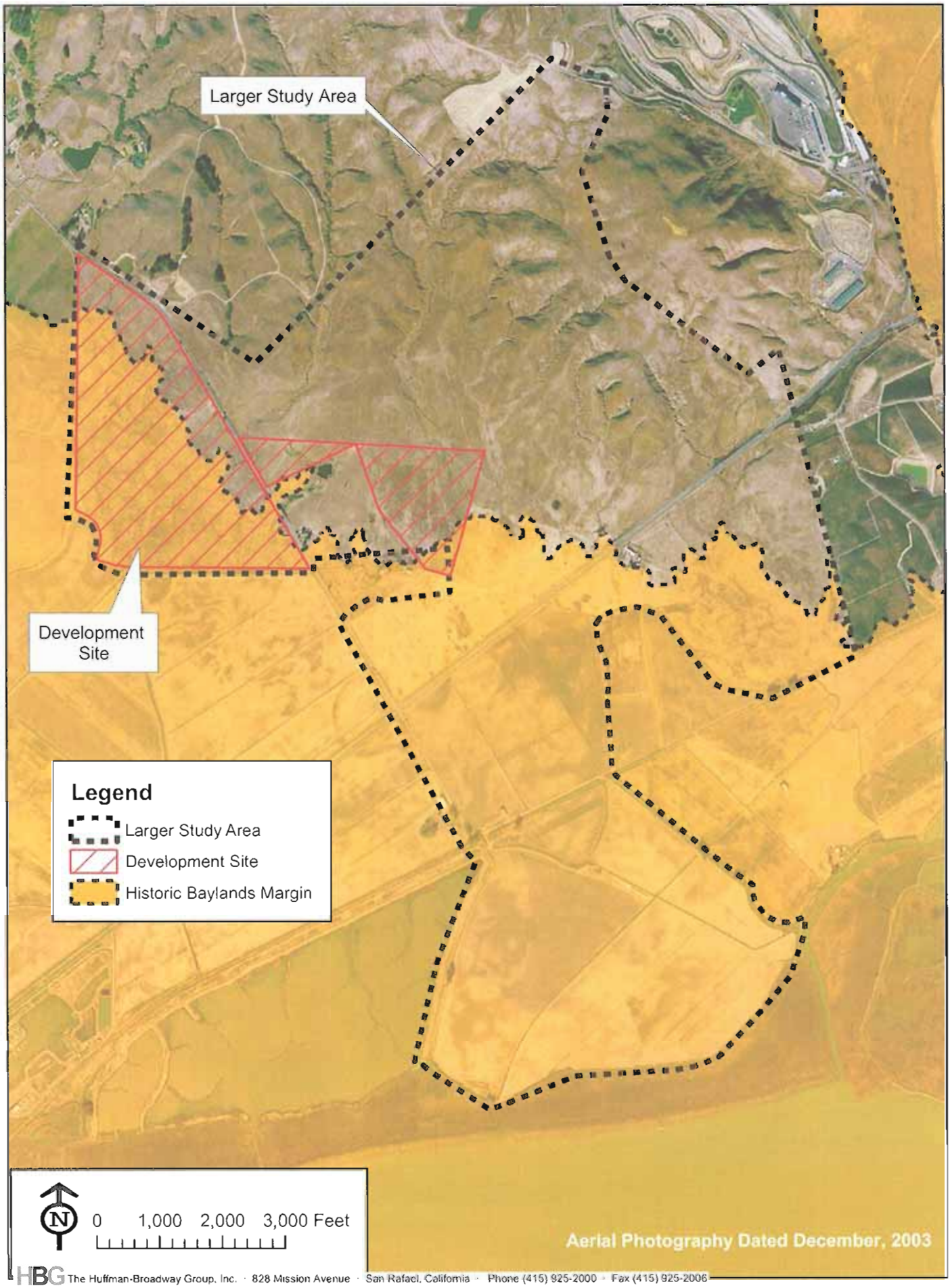

Figure 5. Historic Baylands Margin in the Project Vicinity

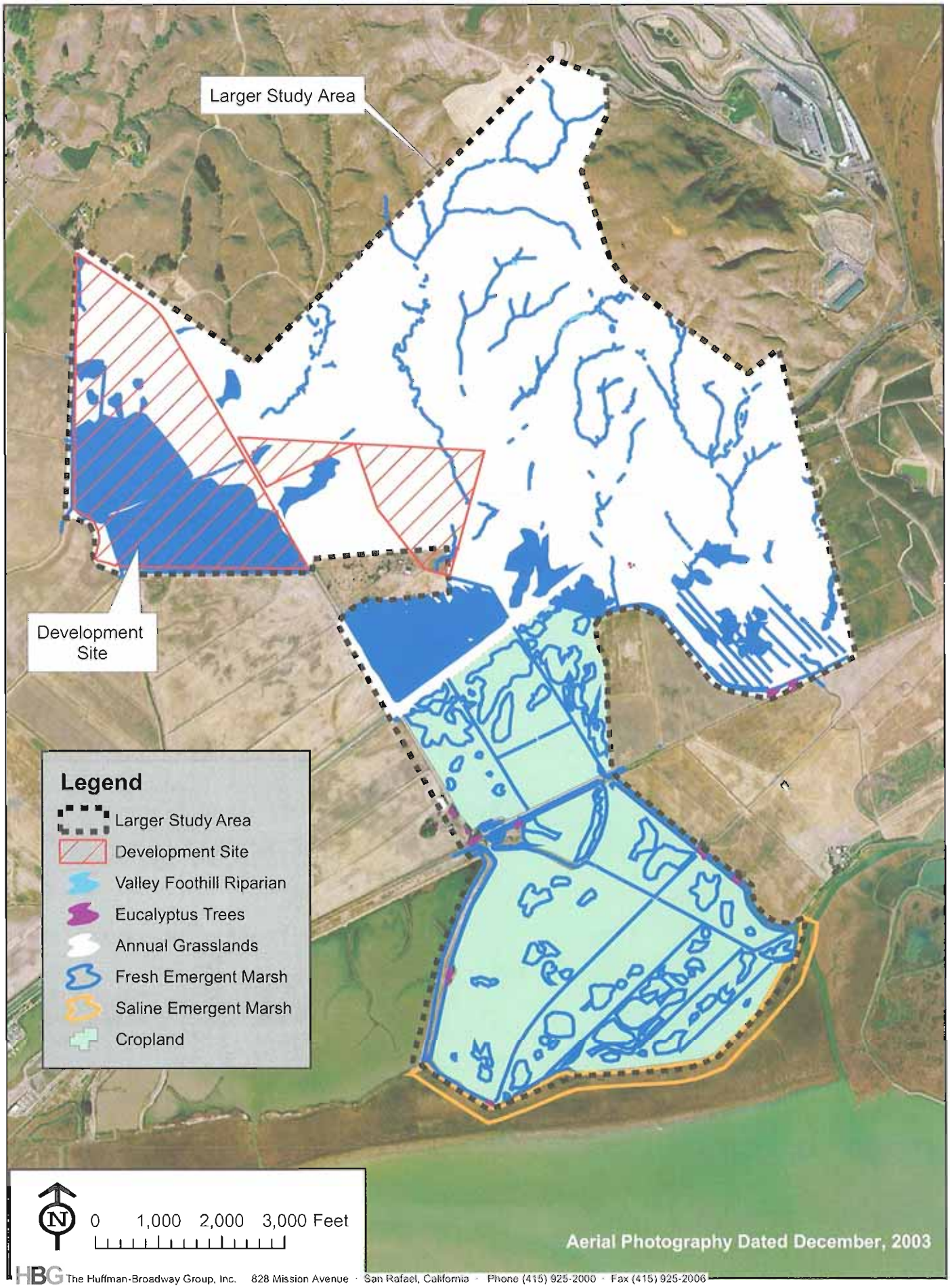

Figure 6. Extent and Distribution of Vegetation Communities in the Study Area

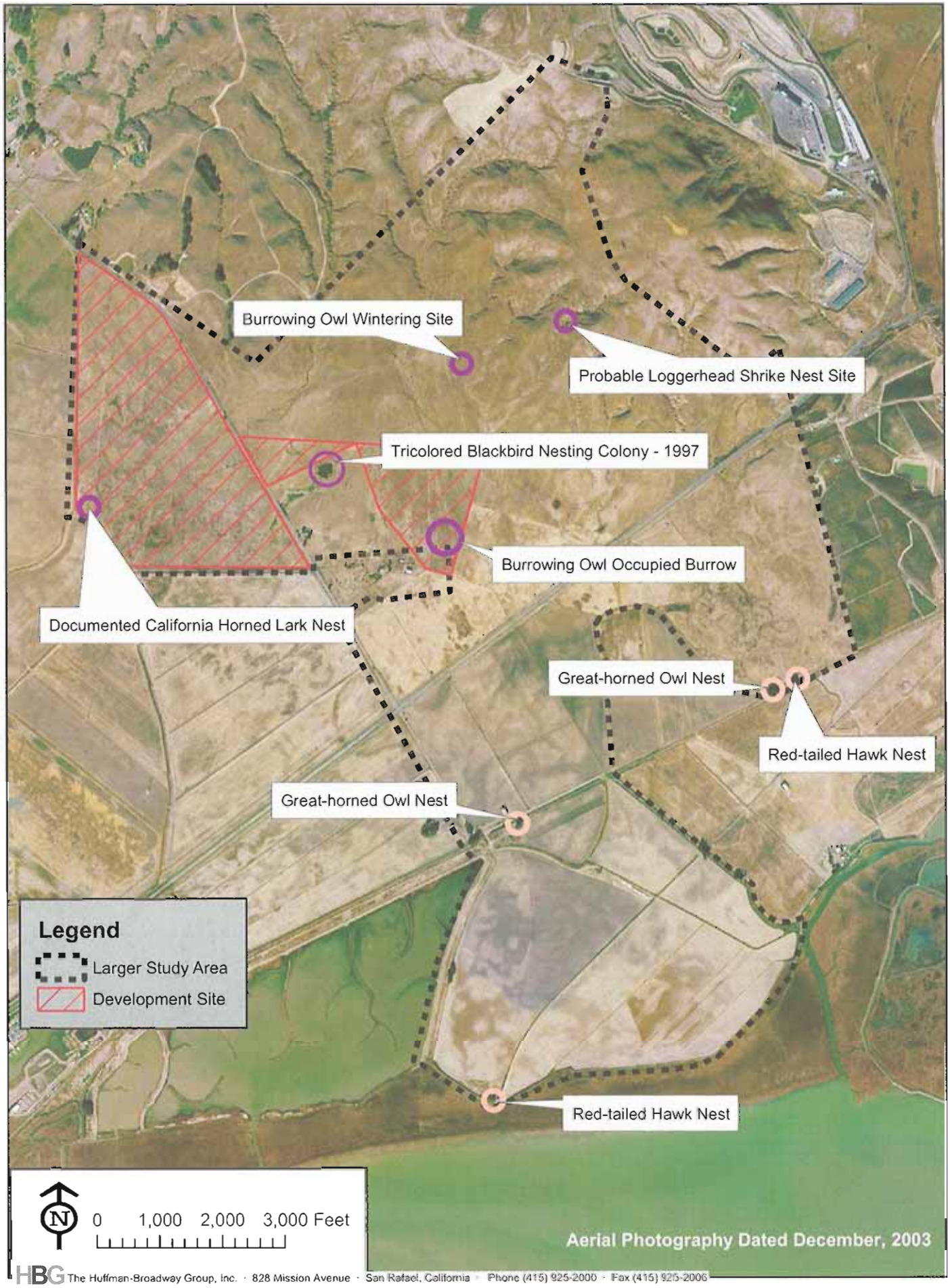

Figure 7. Avian Resource Constraints Occurring in the Study Area

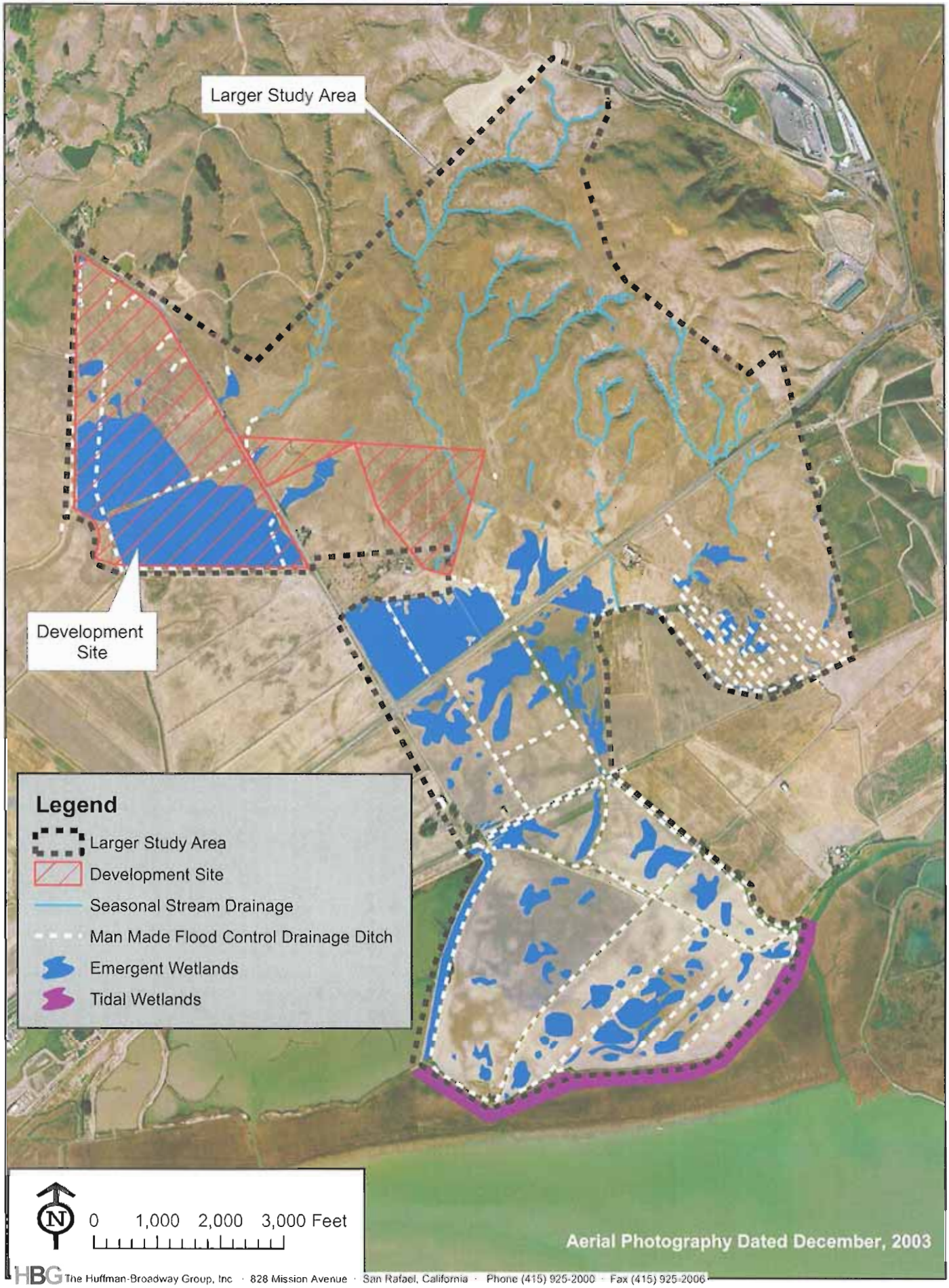

Figure 8. Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction in the Study Area

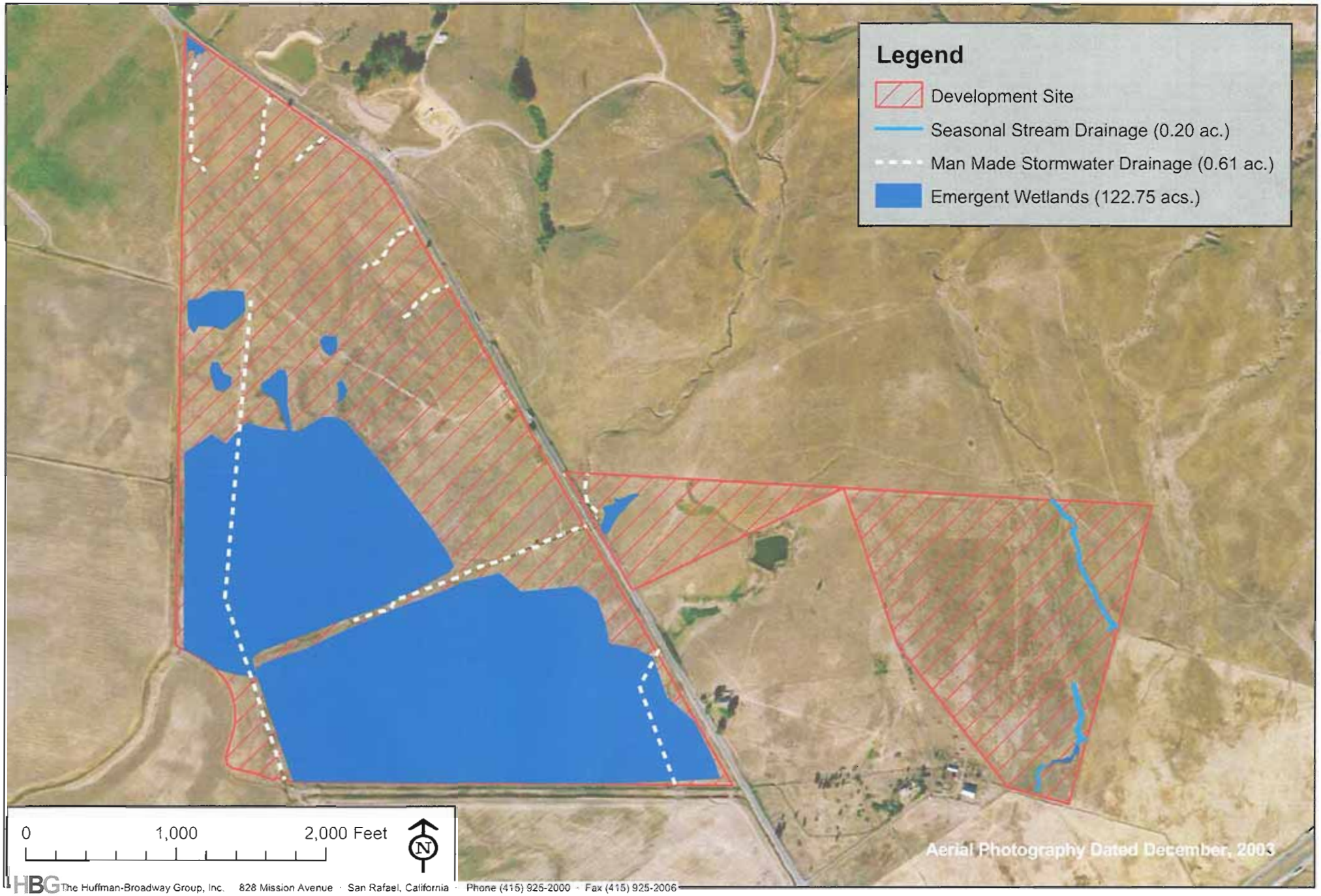

Figure 9. Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction within the Development Site

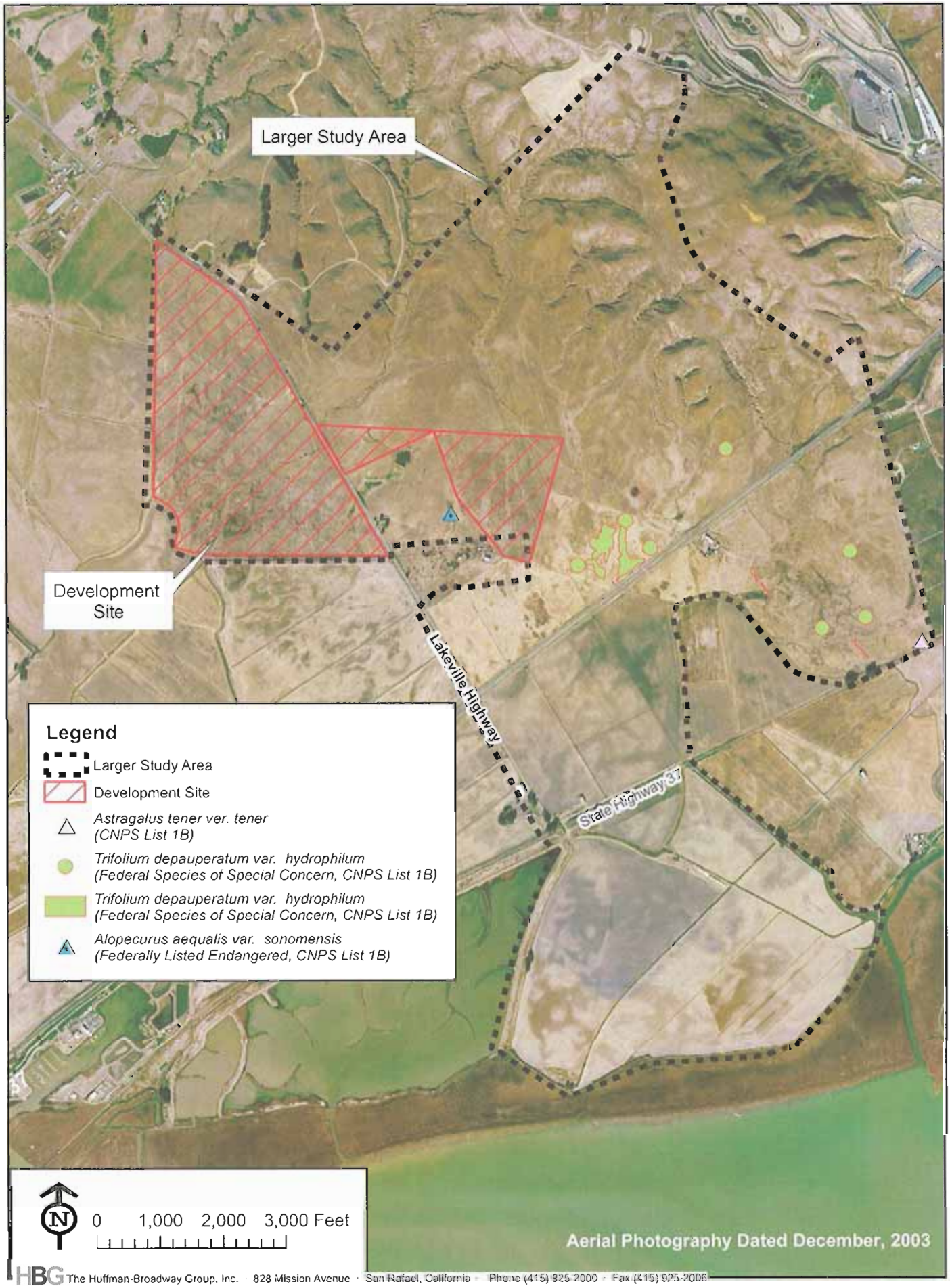

Figure 10. Location of Special Status Plant Populations in the Study Area

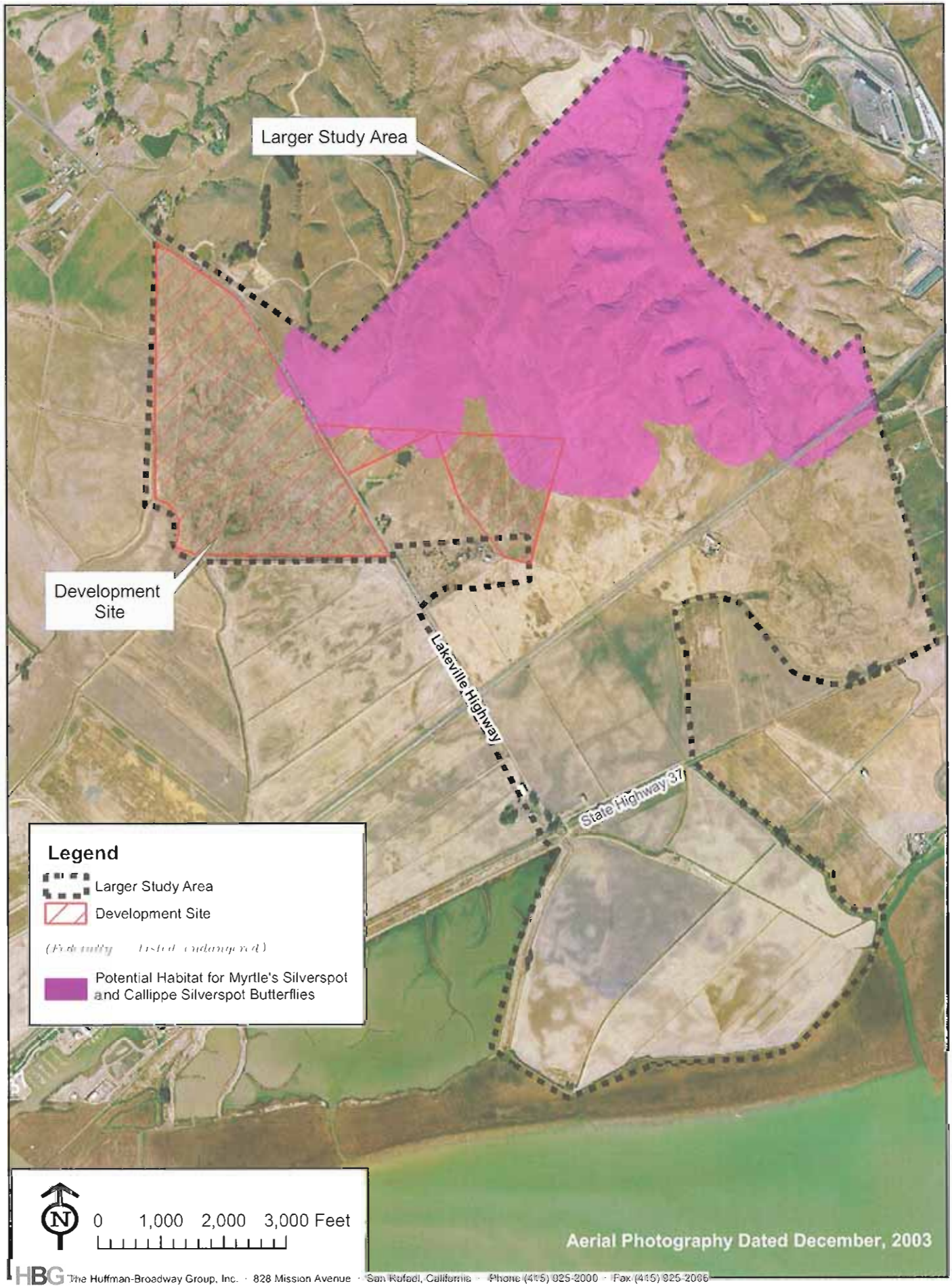

Figure 11. Habitat for Callippe Silverspot and Myrtle's Silverspot Butterfly in the Study Area

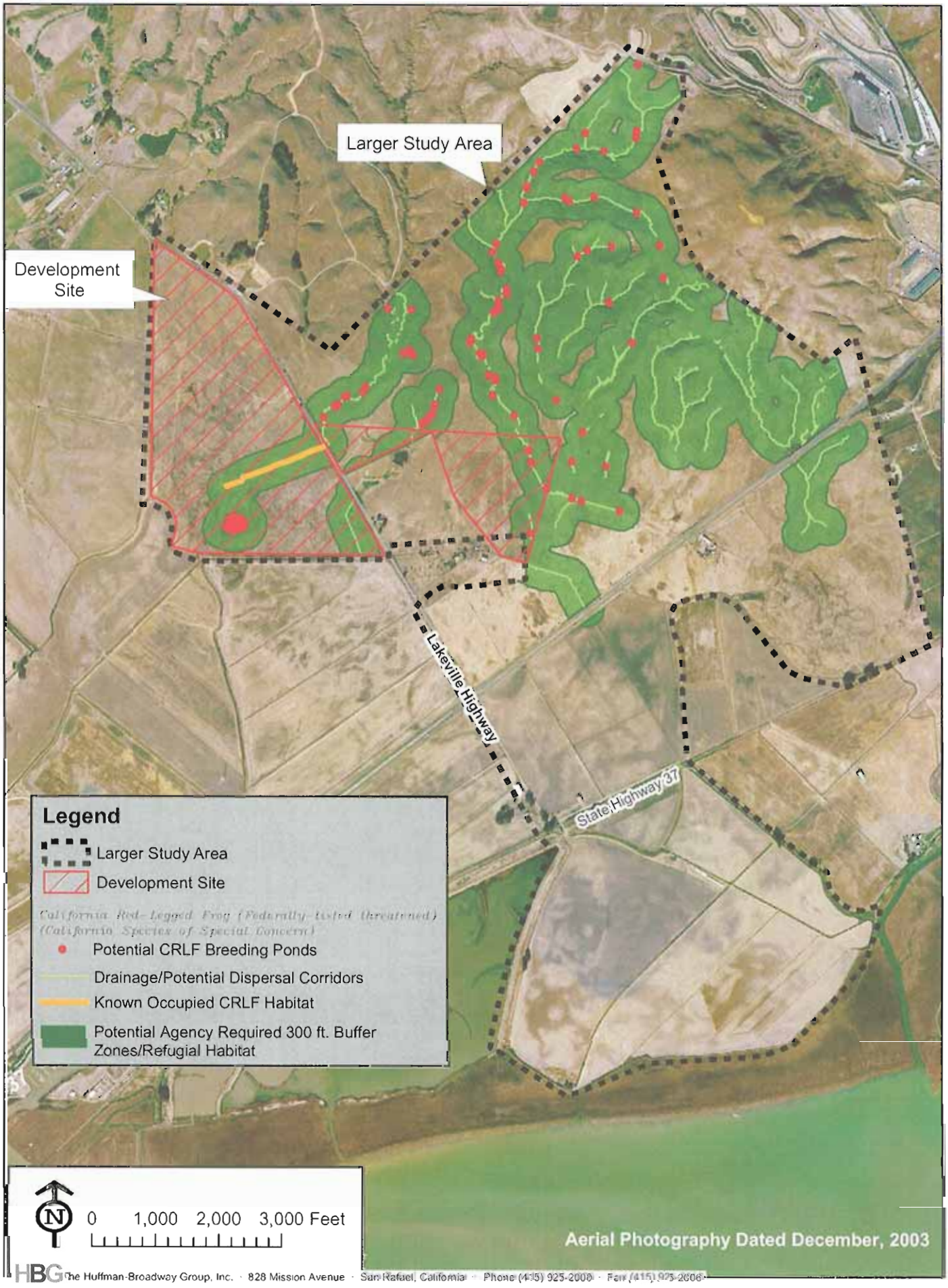

Figure 12. Potential Habitat for California Red-Legged Frog

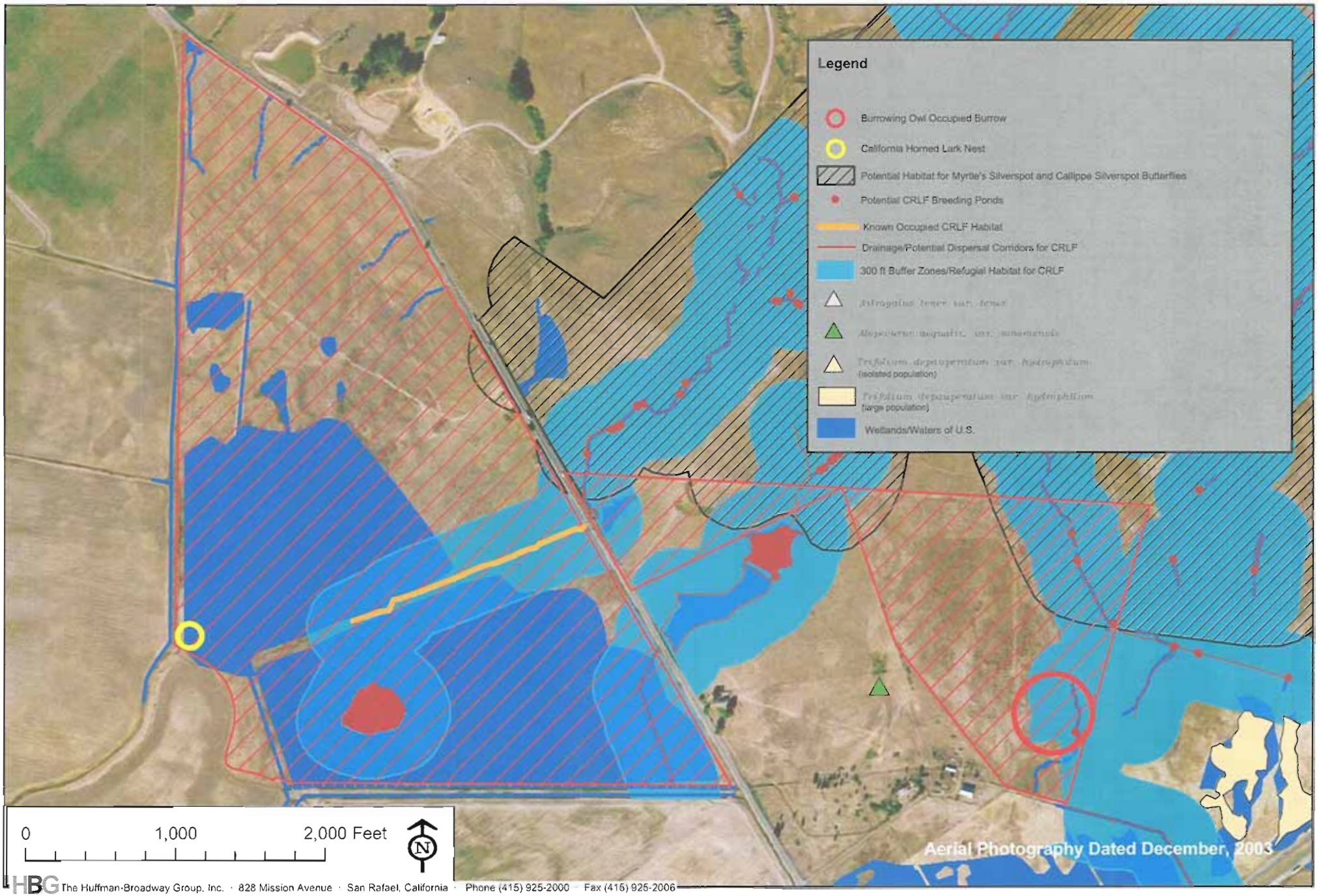

Figure 13. Summary of Environmental Constraints at the Development Site

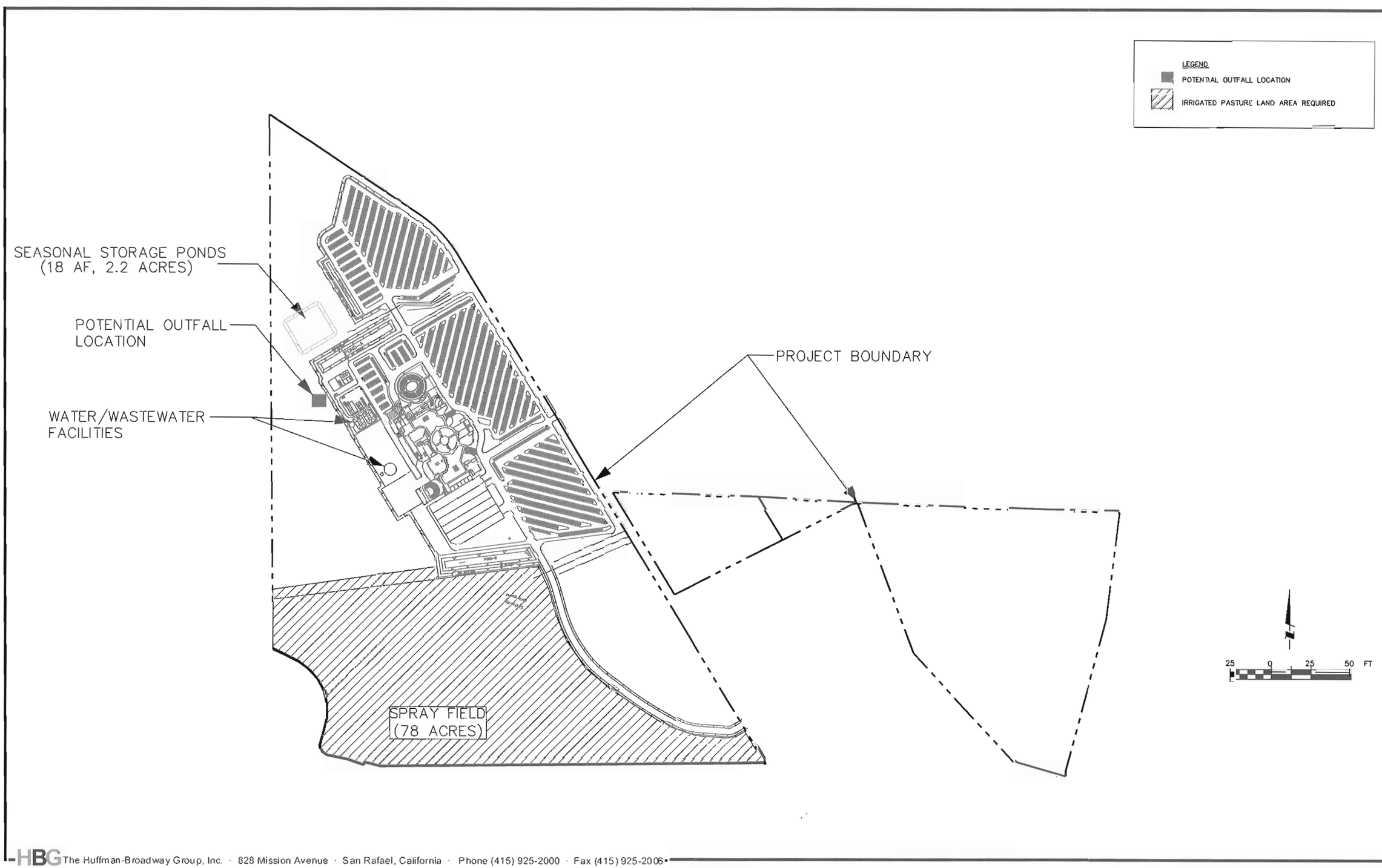

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Figure 14. Project Development Plan-Scenario 1

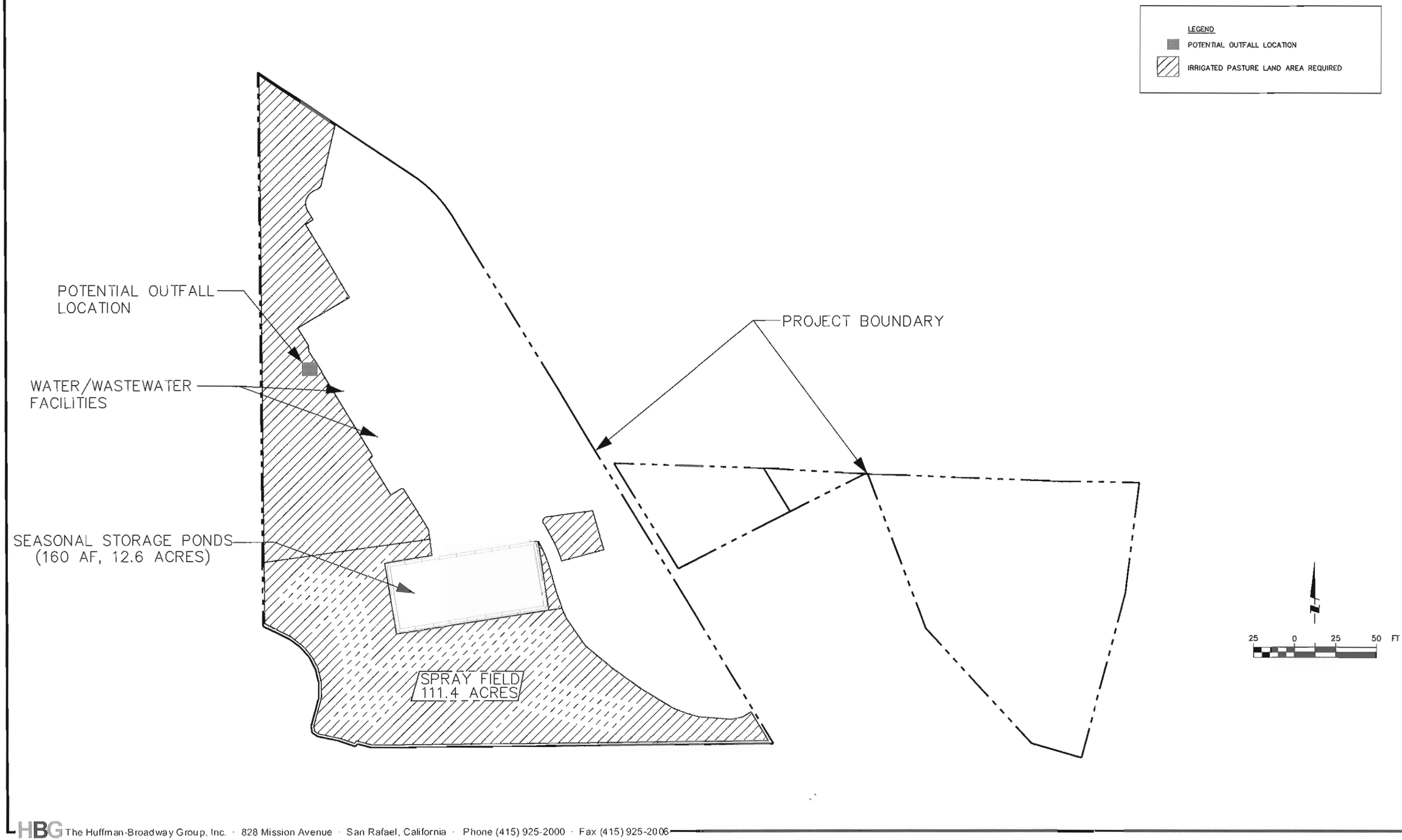

Figure 15. Project Development Plan-Scenario 2

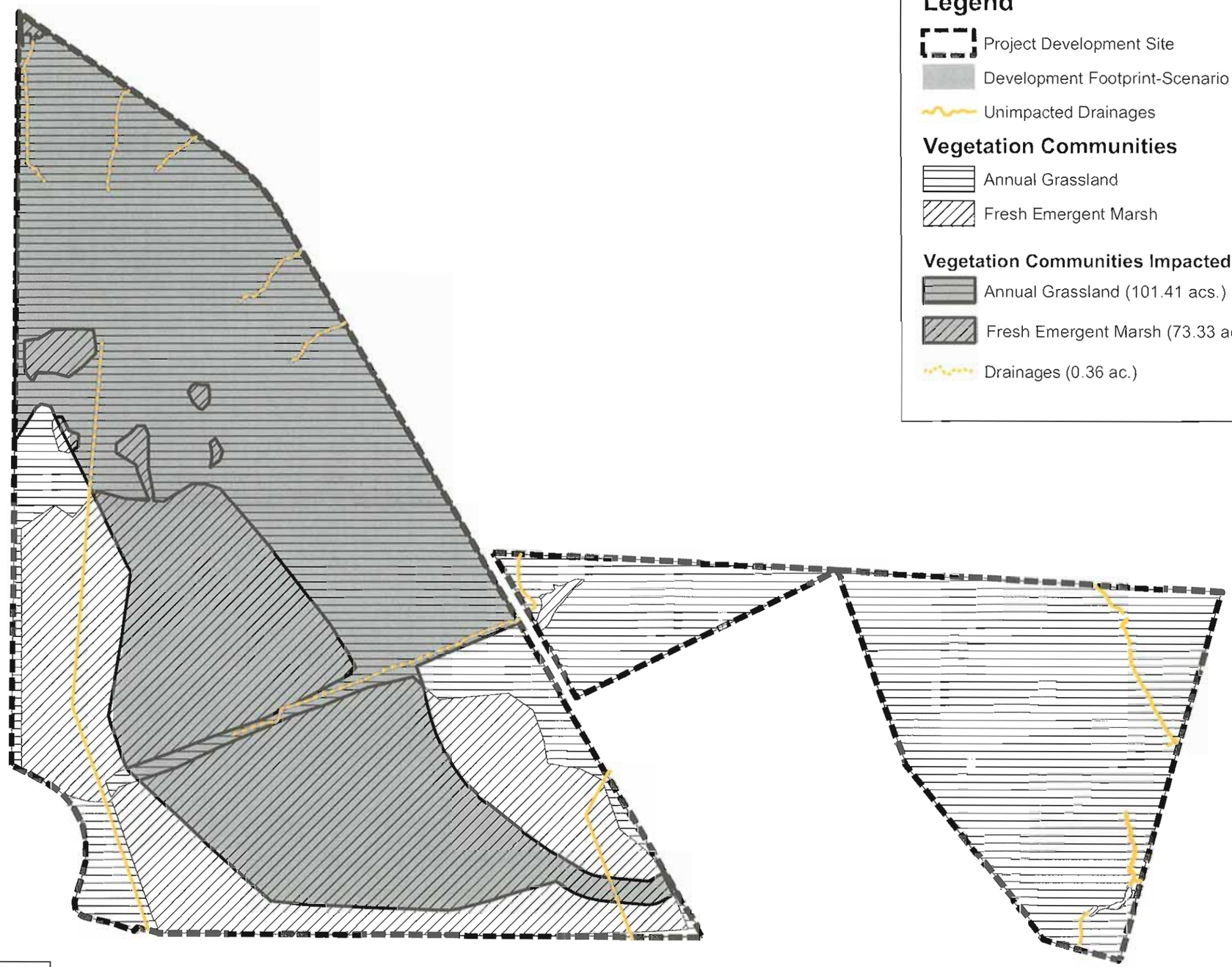

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Figure 16. Vegetation Communities Impacted by Development Footprint-Scenario 1

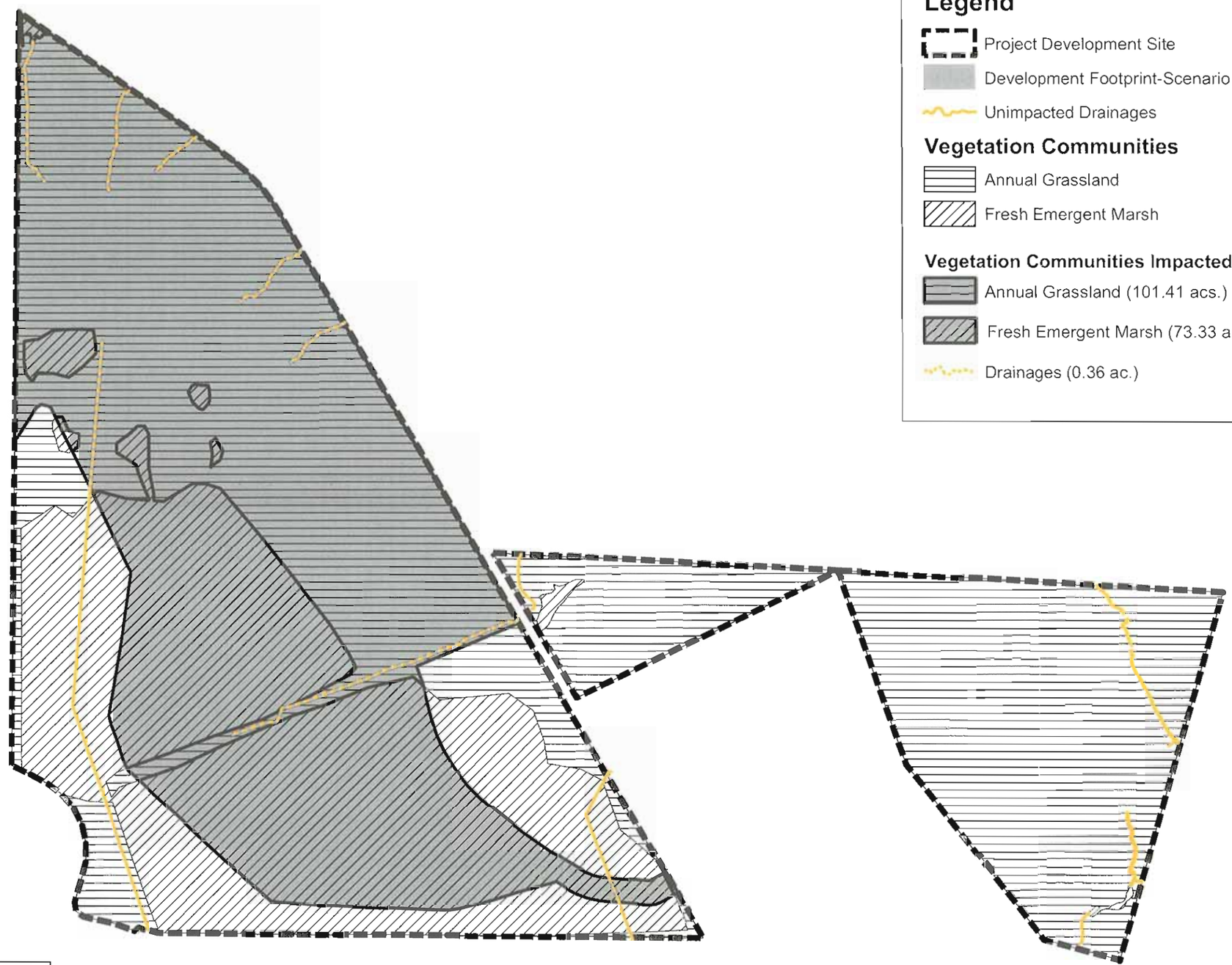

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Figure 17. Vegetation Communities Impacted by Development Footprint-Scenario 2

Figure 18. Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction Impacted by the Development Footprint-Scenario 1

Figure 19. Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction Impacted by the Development Footprint-Scenario 2

Tables

Table 1.

Plant List for North Section

Table 1.
Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma County California
North Section

FERNS AND FERN-ALLIES

EQUISETACEAE
- Equisetum telmateia ssp. braunii

MARSILEACEAE
- Pilularia americana

SINOPTERIDACEAE
- Pentagramma triangularis ssp. triangularis

FLOWERING PLANTS (ANGIOSPERMAE - DICOTYLEDONEAE)

ANACARDIACEAE
- Toxicodendron diversilobum

APIACEAE
- *Conium maculatum
- *Daucus carota
- Eryngium aristulatum var. aristulatum
- Eryngium aristulatum var. aristulatum
- Eryngium armatum
- *Foeniculum vulgare
- Perideridia kelloggii
- Sanicula bipinnatifida
- Sanicula crassicaulis
- *Torilis nodosa

ASTERACEAE
- Achillea millefolium
- Achyrachaena mollis
- Agoseris grandiflora
- *Anthemis cotula
- Baccharis pilularis
- *Carduus pycnocephalus
- *Centaurea calcitrapa
- *Centaurea solstitialis
- *Chamomilla suaveolens
- *Cichorium intybus
- *Cirsium vulgare
- (*?) Conyza sp.
- *Cotula coronopifolia
- *Cynara cardunculus
- *Filago gallica
- Gnaphalium californicum
- Gnaphalium purpureum
- Hesperevax sparsiflora var. sparsiflora
- *Hypochaeris glabra
- *Hypochaeris radicata
- *Lactuca serriola
- Lasthenia glaberrima
- Layia chrysanthemoides
- *Leontodon taraxacoides ssp. longirostris
- Madia gracilis
- Madia sativa
- Micropus californicus var. californicus
- Microseris acuminata
- Microseris douglasii ssp. douglasii
- Microseris douglasii ssp. tenella
- *Picris echioides
- Psilocarphus tenellus var. tenellus
- *Silybum marianum
- *Soliva sessilis
- *Sonchus asper
- *Sonchus oleraceus
- *Tragopogon porrifolius
- Xanthium spinosum
- Xanthium strumarium
- Wyethia angustifolia

BORAGINACEAE
- Amsinckia menziesii var. intermedia
- Amsinckia menziesii var. menziesii
- Plagiobothrys bracteatus
- Plagiobothrys fulvus
- Plagiobothrys nothofulvus
- Plagiobothrys stipitatus var. micranthus
- Plagiobothrys undulatus

BRASSICACEAE
- *Brassica nigra
- *Capsella bursa-pastoris
- Lepidium nitidum
- *Raphanus sativus
- *Rorippa nasturtium-aquaticum
- *Sisymbrium officinale

CALLITRICHACEAE
- Callitriche marginata

CAMPANULACEAE
- Downingia concolor var. concolor
- Downingia pulchella

Table 1.
Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma County California
North Section

CARYOPHYLLACEAE
- *Cerastium glomeratum
- *Silene gallica
- *Spergula arvensis
- Spergularia macrotheca var. leucantha
- *Spergularia rubra
- *Stellaria media

CHENOPODIACEAE
- Atriplex sp.

CONVOLVULACEAE
- Calystegia subacaulis ssp. subacaulis
- *Convolvulus arvensis

CRASSULACEAE
- Crassula aquatica

CUSCUTACEAE
- Cuscuta californica var. californica

EUPHORBIACEAE
- Eremocarpus setigerus
- Euphorbia spathulata

FABACEAE
- *Genista monspessulana
- *Lathyrus aphaca
- *Lathyrus hirsutus
- *Lotus corniculatus
- Lotus purshianus
- Lotus wrangelianus
- Lupinus albifrons var. collinus
- Lupinus bicolor
- Lupinus microcarpus var. densiflorus
- Lupinus nanus
- Lupinus succulentus
- *Medicago polymorpha
- *Melilotus indica
- Thermopsis macrophylla var. macrophylla
- *Trifolium campestre
- *Trifolium cernuum
- Trifolium depauperatum var. depauperatum
- Trifolium depauperatum var. hydrophilum
- *Trifolium dubium
- *Trifolium fragiferum
- Trifolium fucatum
- *Trifolium glomeratum
- Trifolium gracilentum var. gracilentum
- *Trifolium hirtum
- Trifolium microdon
- Trifolium oliganthum
- *Trifolium subterraneum
- *Trifolium tomentosum
- Trifolium variegatum
- Trifolium willdenovii
- *Vicia benghalensis
- *Vicia sativa ssp. nigra
- *Vicia sativa ssp. sativa
- Vicia americana var. americana
- *Vicia villosa ssp. varia

FRANKENIACEAE
- Frankenia salina

GENTIANACEAE
- Centaurium muehlenbergii
- Centaurium venustum

GERANIACEAE
- *Erodium botrys
- *Erodium cicutarium
- *Erodium moschatum
- *Geranium dissectum
- *Geranium molle

LAMIACEAE
- Mentha arvensis
- Stachys ajugoides var. ajugoides
- Stachys ajugoides var. rigida

LYTHRACEAE
- *Lythrum hyssopifolium

MALVACEAE
- *Malva nicaeensis
- Malvella leprosa
- Sidalcea malvaeflora ssp. laciniata

ONAGRACEAE
- Epilobium brachycarpum
- Epilobium ciliatum ssp. watsonii

OXALIDACEAE
- (*?) Oxalis sp.

PAPAVERACEAE
- Eschscholzia californica

PLANTAGINACEAE
- *Plantago lanceolata
- *Plantago major

Table 1.
Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma County California
North Section

POLYGONACEAE
- *Polygonum arenastrum
- *Rumex acetosella
- *Rumex crispus
- *Rumex pulcher
- Rumex salicifolius var. salicifolius
- Rumex salicifolius var. transitorius

PORTULACEAE
- Claytonia perfoliata

PRIMULACEAE
- *Anagallis arvensis

RANUNCULACEAE
- Delphinium hesperium ssp. hesperium
- Delphinium variegatum ssp. variegatum
- Ranunculus aquatilus var. capillaceus
- Ranunculus californicus
- Ranunculus sceleratus
- *Ranunculus muricatus

ROSACEAE
- *Prunus sp.
- *Rubus discolor

RUBIACEAE
- *Galium aparine
- *Galium divaricatum
- *Galium murale
- *Sherardia arvensis

SALICACEAE
- Salix exigua
- Salix laevigata
- Salix lasiolepis

SCROPHULARIACEAE
- *Bellardia trixago
- Castilleja ambigua ssp. ambigua
- Castilleja attenuata
- Castilleja densiflora ssp. densiflora
- *Kickxia elatine
- Mimulus guttatus
- *Parentucellia viscosa
- Triphysaria pusilla
- Triphysaria versicolor ssp. faucibarbata
- Veronica peregrina ssp. xalapensis

URTICACEAE
- *Urtica urens

VERBENACEAE
- Phyla nodiflora var. nodiflora
- Verbena lasiostachys var. scabrida

VIOLACEAE
- Viola pedunculata

FLOWERING PLANTS (ANGIOSPERMAE - MONOCOTYLEDONEAE)

ALISMATACEAE
- Alisma plantago-aquatica

CYPERACEAE
- Carex obnupta
- Cyperus eragrostis
- Eleocharis macrostachya
- Scirpus acutus var. occidentalis
- Scirpus cernuus

IRIDACEAE
- Sisyrinchium bellum

JUNCACEAE
- Juncus balticus
- Juncus bufonius var. bufonius
- Juncus bufonius var. congestus
- Juncus effusus var. pacificus
- Juncus patens
- Juncus phaeocephalus var. paniculatus

JUNCAGINACEAE
- Lilaea scilloides

LEMNACEAE
- Lemna gibba
- Lemna valdiviana

LILIACEAE
- Brodiaea elegans ssp. elegans
- Calochortus luteus
- Calochortus venustus
- Chlorogalum pomeridianum
- Dichelostemma capitatum ssp. capitatum
- Triteleia hyacinthina
- Triteleia laxa

ORCHIDACEAE
- Spiranthes romanzoffiana

Table 1.
Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma County California
North Section

POACEAE
- *Agrostis avenacea
- *Aira caryophyllea
- Alopecurus aequalis var. sonomensis
- *Avena barbata
- *Avena fatua
- *Brachypodium distachyon
- *Briza maxima
- *Briza minor
- *Bromus alopecurus
- *Bromus diandrus
- *Bromus hordeaceus
- *Cynodon dactylon
- *Cynosurus echinatus
- Danthonia californica
- Deschampsia danthonioides
- Distichlis spicata
- Elymus glaucus ssp. glaucus
- Elymus multisetus
- *Festuca arundinacea
- Glyceria occidentalis
- *Holcus lanatus
- Hordeum brachyantherum
- *Hordeum marinum ssp. gussoneanum
- *Hordeum murinum ssp. leporinum
- Leymus triticoides
- *Lolium multiflorum
- *Lolium perenne
- Nassella cernuua
- Nassella pulchra
- *Parapholis incurva
- Paspalum distichum
- *Phalaris aquatica
- *Phalaris paradoxa
- Pleuropogon californicus
- *Poa annua
- *Polypogon interruptus
- *Polypogon monspeliensis
- *Taeniatherum caput-medusae
- *Vulpia bromoides
- *Vulpia myuros var. myuros

POTAMOGETONACEAE
- Potamogeton nodosus

TYPHACEAE
- Typha angustifolia
- Typha domingensis

*Species introduced or naturalized in the study area.

Table 2.

Plant List for West Section

Table 2.

Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma, County, California
West Section

FLOWERING PLANTS (ANGIOSPERMAE - DICOTYLEDONEAE)

APIACEAE
- Eryngium aristulatum var. aristulatum
- Eryngium armatum
- *Foeniculum vulgare

ASTERACEAE
- Achyrachaena mollis
- *Anthemis cotula
- *Carduus pycnocephalus
- *Centaurea calcitrapa
- *Centaurea solstitialis
- *Chamomilla suaveolens
- *Cotula coronopifolia
- *Cynara cardunculus
- *Hypocharis glabra
- *Hypocharis radicata
- *Lactuca serriola
- Lasthenia glaberrima
- Madia sativa
- Microseris douglasii ssp. douglasii
- *Picris echioides
- *Silybum marianum
- Xanthium spinosum
- Xanthium strumarium

BORAGINACEAE
- Plagiobothrys bracteatus
- Plagiobothrys fulvus
- Plagiobothrys stipitatus var. micranthus

BRASSICACEAE
- *Capsella bursa-pastoris
- *Raphanus sativus

CARYOPHYLLACEAE
- *Spergula arvensis
- *Spergularia bocconii
- *Spergularia rubra

CHENOPODIACEAE
- Atriplex sp.

CONVOLVULACEAE
- *Convolvulus arvensis

CUSCUTACEAE
- Cuscuta californica var. californica

FABACEAE
- *Lathyrus hirsutus
- *Lotus corniculatus
- Lupinus bicolor
- Lupinus nanus
- *Medicago polymorpha
- *Trifolium campestre
- *Trifolium dubium
- *Trifolium fragiferum
- Trifolium fucatum
- *Trifolium subterraneum *Trifolium tomentosum
- *Vicia benghalensis
- *Vicia sativa ssp. sativa

GENTIANACEAE
- Centaurium muehlenbergii

GERANIACEAE
- *Erodium botrys
- *Geranium dissectum

LAMIACEAE
- Mentha arvensis
- Stachys ajugoides var. ajugoides

LYTHRACEAE
- *Lythrum hyssopifolium

MALVACEAE
- *Malva nicaeensis

PAPAVERACEAE
- Eschscholzia californica

PLANTAGINACEAE
- *Plantago lanceolata

POLEMONIACEAE
- Navarretia squarrosa

POLYGONACEAE
- *Polygonum arenastrum
- *Rumex acetosella
- *Rumex crispus
- *Rumex pulcher

PORTULACEAE
- Calandrinia ciliata

PRIMULACEAE
- *Anagallis arvensis

Table 2.

Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma, County, California
West Section

RANUNCULACEAE
- *Ranunculus muricatus

SALICACEAE
- Salix laevigata

SCROPHULARIACEAE
- *Bellardia trixago
- Castilleja ambigua ssp. ambigua
- Castilleja attenuata
- Castilleja densiflora ssp. densiflora
- *Parentucellia viscosa
- Triphysaria pusilla
- Triphysaria versicolor ssp. faucibarbata

FLOWERING PLANTS (ANGIOSPERMAE - MONOCOTYLEDONEAE)

CYPERACEAE
- Eleocharis macrostachya

IRIDACEAE
- Sisyrinchium bellum

JUNCACEAE
- Juncus bufonius var. bufonius
- Juncus bufonius var. congestus
- Juncus phaeocephalus var. paniculatus

JUNCAGINACEAE
- Lilaea scilloides

LILIACEAE
- Brodiaea elegans ssp. elegans
- Triteleia hyacinthina

POACEAE
- *Agrostis avenacea
- *Aira caryophyllea
- *Avena barbata
- *Avena fatua
- *Briza maxima
- *Briza minor
- *Bromus diandrus
- *Bromus hordeaceus
- Danthonia californica
- Glyceria occidentalis
- *Hordeum marinum ssp. gussoneanum
- *Hordeum murinum ssp. leporinum
- Leymus triticoides
- *Lolium multiflorum
- *Lolium perenne
- Nassella pulchra
- *Parapholis incurva
- *Phalaris caroliniana
- *Phalaris paradoxa
- Pleuropogon californicus
- *Poa annua
- *Polypogon monspeliensis
- *Vulpia bromoides
- *Vulpia myuros var. myuros

*Species introduced or naturalized in the study area.

Table 3.

Plant List for Middle Section

Table 3.

Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma, County, California Middle Section

FLOWERING PLANTS (ANGIOSPERMAE - DICOTYLEDONEAE)

APIACEAE
- *Conium maculatum
- Eryngium aristulatum var. aristulatum
- Eryngium armatum
- *Foeniculum vulgare

ASTERACEAE
- Achyrachaena mollis
- *Anthemis cotula
- Baccharis douglasii
- Baccharis pilularis
- *Carduus pycnocephalus
- *Centaurea calcitrapa
- *Centaurea solstitialis
- *Chamomilla suaveolens
- *Cichorium intybus
- *Cirsium vulgare
- *Cotula coronopifolia
- *Filago gallica
- *Gnaphalium luteo-album
- Hemizonia congesta ssp. congesta
- Hesperevax sparsiflora var. sparsiflora
- *Hypocharis glabra
- *Hypocharis radicata
- *Lactuca serriola
- *Lactuca virosa
- Lasthenia californica
- Lasthenia glaberrima
- Layia chrysanthemoides
- Madia sativa
- Microseris douglasii ssp. douglasii
- *Picris echioides
- Psilocarphus tenellus var. tenellus
- *Senecio sylvaticus
- *Silybum marianum
- *Soliva sessilis
- *Sonchus oleraceus
- Xanthium spinosum
- Xanthium strumarium
- Wyethia angustifolia

BORAGINACEAE
- Amsinckia eastwoodiae
- Amsinckia menziesii var. intermedia
- Plagiobothrys bracteatus
- Plagiobothrys stipitatus var. micranthus

BRASSICACEAE
- *Brassica nigra
- *Brassica rapa
- *Capsella bursa-pastoris
- *Lepidium latifolium
- Lepidium latipes
- Lepidium nitidum
- *Raphanus sativus
- *Rorippa nasturtium-aquaticum
- *Sisymbrium officinale

CARYOPHYLLACEAE
- *Cerastium glomeratum
- Sagina procumbens
- *Silene gallica
- *Spergula arvensis
- Spergularia macrotheca var. leucantha
- *Spergularia rubra

CHENOPODIACEAE
- Atriplex sp.
- Chenopodium berlandieri
- *Chenopodium murale

CONVOLVULACEAE
- Calystegia subacaulis ssp. subacaulis
- *Convolvulus arvensis
- Cressa truxillensis

CUSCUTACEAE
- Cuscuta californica var. californica

FABACEAE
- Astragalus tener var. tener
- *Lotus corniculatus
- Lotus wrangelianus
- Lupinus bicolor
- Lupinus nanus
- *Medicago polymorpha
- *Melilotus indica
- Trifolium barbigerum var. barbigerum
- *Trifolium campestre
- *Trifolium cernuum
- Trifolium depauperatum var depauperatum
- Trifolium depauperatum var. hydrophilum
- *Trifolium dubium
- *Trifolium fragiferum
- Trifolium fucatum
- *Trifolium glomeratum

Table 3.

Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma, County, California Middle Section

*Trifolium hirtum
Trifolium microcephalum
Trifolium microdon
Trifolium obtusiflorum
Trifolium oliganthum
*Trifolium subterraneum *Trifolium tomentosum
Trifolium variegatum
*Vicia benghalensis
*Vicia sativa ssp. nigra
*Vicia sativa ssp. sativa

FRANKENIACEAE
Frankenia salina

GENTIANACEAE
Centaurium muehlenbergii

GERANIACEAE
*Erodium botrys
*Erodium moschatum
*Geranium dissectum

LAMIACEAE
Mentha arvensis

LYTHRACEAE
*Lythrum hyssopifolium

MALVACEAE
*Malva nicaeensis
*Malva parviflora

MYRTACEAE
*Eucalyptus sp.

ONAGRACEAE
Camissonia ovata
Epilobium brachycarpum

PAPAVERACEAE
Eschscholzia californica

PLANTAGINACEAE
Plantago elongata
*Plantago lanceolata

POLYGONACEAE
*Polygonum arenastrum
*Rumex acetosella
*Rumex conglomeratus
*Rumex crispus
*Rumex dentatus
*Rumex pulcher
Rumex salicifolius var. salicifolius

PORTULACEAE
Calandrinia ciliata

PRIMULACEAE
*Anagallis arvensis

RANUNCULACEAE
*Ranunculus muricatus
Ranunculus sceleratus

ROSACEAE
*Rubus discolor

RUBIACEAE
Galium tricornutum

SALICACEAE
Salix lasiolepis

SCROPHULARIACEAE
*Bellardia trixago
Castilleja attenuata
Castilleja densiflora ssp. densiflora
*Kickxia elatine
*Parentucellia viscosa
Triphysaria pusilla
Triphysaria versicolor ssp. faucibarbata

URTICACEAE
*Urtica urens

FLOWERING PLANTS (ANGIOSPERMAE - MONOCOTYLEDONEAE)

CYPERACEAE
Cyperus eragrostis
Scirpus robustus

JUNCACEAE
Juncus balticus
Juncus bufonius var. bufonius
Juncus bufonius var. congestus
Juncus phaeocephalus var. paniculatus

Table 3.

Vascular Plant Species Observed in the Sonoma Project Study Area, Sonoma, County, California Middle Section

JUNCAGINACEAE
- Lilaea scilloides

LILIACEAE
- Brodiaea elegans ssp. elegans
- Triteleia hyacinthina

POACEAE
- *Agrostis avenacea
- *Aira caryophyllea
- *Avena barbata
- *Avena fatua
- *Briza maxima
- *Briza minor
- *Bromus alopecurus
- *Bromus diandrus
- *Bromus hordeaceus
- *Crypsis schoenoides
- Danthonia californica
- Deschampsia danthonioides
- *Festuca arundinacea
- Hordeum brachyantherum
- *Hordeum marinum ssp. gussoneanum
- *Hordeum murinum ssp. leporinum
- Leymus triticoides
- *Lolium multiflorum
- *Lolium perenne
- Nassella pulchra
- *Parapholis incurva
- *Paspalum dilatatum
- Phalaris lemmonii
- *Phalaris paradoxa
- Pleuropogon californicus
- *Poa annua
- *Polypogon monspeliensis
- *Taeniatherum caput-medusae
- *Vulpia bromoides
- *Vulpia myuros var. myuros

TYPHACEAE
- Typha domingensis

*Species introduced or naturalized in the study area.

Table 4.

Plant List for South Section

Table 4.

Plant List for South Section
(Compiled by Virginia Dains, May 22, 2003)

Family	Scientific Name	Common Name	Wetland Indicator
Aizoaceae			
	Carpobrotus chilensis	sea fig	
Apiaceae			
	Conium maculatum	poison hemlock	FAC
	Foeniculum vulgare	fennel	FACU-
Asteraceae			
	Anthemis cotula	dog-fennel	FACU
	Baccharis pilularis	coyote brush	NI
	Carduus pycnocephalus	Italian thistle	NI
	Centaurea solstitialis	yellow star-thistle	NI
	Cotula coronopifolia	brass-buttons	FACW+
	Gnaphalium palustre	western marsh cudweed	FACW
	Grindelia camporum	Great Valley gumweed	FACU
	Leontodon taraxacoides	hawkbit	FACU
	Senecio vulgaris	common groundsel	NI*
	Silybum marianum	milk thistle	NI
	Sonchus asper ssp. asper	prickly sow thistle	FAC
	Taraxacum officinale	common dandelion	FACU
Boraginaceae			
	Plagiobothrys bracteatus	bracted popcorn flower	OBL
	Plagiobothrys trachycarpus	rough-fruited allocarya	FACW*
Brassicaceae			
	Brassica nigra	black mustard	NI
	Lepidium latifolium	broad-leaved pepper-grass	FACW
	Raphanus sativus	wild radish	UPL
	Sisymbrium officinale	hedge mustard	NI
Caryophyllaceae			
	Spergularia rubra	red sandspurry	FAC-
Chenopodiaceae			
	Atriplex patula	spear oracle	FACW
	Atriplex semibaccata	Australian saltbush	FAC
	Salicornia virginica	pickleweed	OBL
Convolvulaceae			
	Convolvulus arvensis	field bindweed	NI
Cuscutaceae			
	Cuscuta salina	salt marsh dodder	NI
Cyperaceae			
	Scirpus americanus	American tule	OBL
	Scirpus robustus	big bulrush	OBL
Fabaceae			

Table 4.

Plant List for South Section
(Compiled by Virginia Dains, May 22, 2003)

Family	Scientific Name	Common Name	Wetland Indicator
	Lotus corniculatus	bird's-foot trefoil	FAC
	Medicago polymorpha	California burclover	FACU-
	Melilotus alba	white sweetclover	
	Trifolium incarnatum	crimson clover	NI
	Vicia sativa	spring vetch	
Frankeniaceae			
	Frankenia salina	alkali heath	FACW+
Juncaceae			
	Juncus bufonius	toad rush	FACW+
Lythraceae			
	Lythrum hyssopifolium	hyssop loosestrife	
Myrtaceae			
	Eucalyptus globulus	blue gum	NI
Onagraceae			
	Epilobium brachycarpum	autumn willowweed	UPL
Plantaginaceae			
	Plantago elongata	long-leaf plantain	FACW*
Poaceae			
	Avena barbata	slender wild oats	NI
	Avena sativa	common oats	NI
	Briza minor	little quaking grass	FACU
	Bromus diandrus	ripgut brome	NI
	Dactylis glomerata	orchard-grass	FACU
	Distichlis spicata	saltgrass	FACW
	Festuca arundinacea	tall fescue	FAC-
	Hordeum brachyantherum	meadow barley	FACW
	Hordeum murinum ssp. leporinum	foxtail barley	UPL
	Leptochloa fascicularis	sprangletop	OBL
	Leymus triticoides	creeping wild-rye	FAC+
	Lolium perenne	English rye-grass	FAC*
	Phalaris aquatica	Harding grass	FAC
	Phalaris paradoxa	hood canarygrass	FAC*
	Polypogon interruptus	ditch beard grass	OBL
	Polypogon monspeliensis	annual beard grass	FACW+
	Spartina foliosa	California cord grass	OBL
	Vulpia myuros	rattail fescue	FACU*
Polygonaceae			
	Polygonum arenastrum	common knotweed	FAC
	Rumex acetosella	common sheep sorrel	FAC-
	Rumex crispus	curly dock	FACW-
	Rumex pulcher	fiddle dock	FAC+
Portulacaceae			

Table 4.

Plant List for South Section
(Compiled by Virginia Dains, May 22, 2003)

Family	Scientific Name	Common Name	Wetland Indicator
	Calandrinia ciliata	red maids	FACU*
	Claytonia perfoliata	miner's lettuce	FACU
Primulaceae			
	Anagallis arvensis	scarlet pimpernel	FAC
Rubiaceae			
	Galium aparine	common bedstraw	FACU
Scrophulariaceae			
	Parentucellia viscosa	yellow parentucellia	FAC
	Veronica persica	Persian speedwell	NI
Typhaceae			
	Typha angustifolia	narrow-leaf cattail	OBL
	Typha latifolia	broadleaf cattail	OBL

Table 5.

Plant List for Highway Rights of Way
(Compiled by Virginia Dains, May 22 & June 23-26, 2003)

Table 5.

Plant List for Highway Rights of Way
(Compiled by Virginia Dains, May 22 & June 23-26, 2003)

Family	Scientific Name	Common Name	Wetland Indicator
Aizoaceae			
	Carpobrotus chilensis	sea fig	
Alismataceae			
	Alisma plantago-aquatica	water plantain	OBL
Apiaceae			
	Anthriscus caucalis	bur-chervil	NI
	Conium maculatum	poison hemlock	FAC
	Daucus carota	carrot	NI
	Eryngium aristulatum	Jepson's button-celery	OBL
	Foeniculum vulgare	fennel	FACU-
	Torilis arvensis	field hedge-parsley	NI
Asteraceae			
	Achillea millefolium	yarrow	FACU
	Anthemis cotula	dog-fennel	FACU
	Artemisia douglasiana	mugwort	FAC+
	Baccharis pilularis	coyote brush	NI
	Carduus pycnocephalus	Italian thistle	NI
	Centaurea calcitrapa	red star-thistle	NI
	Centaurea solstitialis	yellow star-thistle	NI
	Cichorium intybus	chicory	NI
	Cotula coronopifolia	brass-buttons	FACW+
	Cynara cardunculus	cardoon	NI
	Euthamia occidentalis	western flat-topped goldenrod	OBL
	Helenium puberulum	rosilla	FACW
	Helianthus annuus	common sunflower	FAC-
	Holocarpha virgata	narrow tarplant	NI
	Iva axillaris	povertyweed	
	Lactuca saligna	narrow-leaved wild-lettuce	NI*
	Lactuca serriola	prickly lettuce	FAC
	Lasthenia glaberrima	smooth goldfields	OBL
	Leontodon taraxacoides	hawkbit	FACU
	Picris echioides	bristly ox-tongue	FAC
	Senecio vulgaris	common groundsel	NI*
	Silybum marianum	milk thistle	NI
	Sonchus oleraceus	common sow thistle	NI*
	Tragopogon porrifolius	salsify	NI
	Xanthium strumarium	cocklebur	FAC+
Boraginaceae			
	Plagiobothrys bracteatus	bracted popcorn flower	OBL
Brassicaceae			
	Brassica nigra	black mustard	NI
	Brassica rapa	field mustard	NI

Table 5.

Plant List for Highway Rights of Way
(Compiled by Virginia Dains, May 22 & June 23-26, 2003)

Family	Scientific Name	Common Name	Wetland Indicator
	Capsella bursa-pastoris	shepherd's purse	FAC-
	Lepidium latifolium	broad-leaved pepper-grass	FACW
	Lepidium perfoliatum	Klamath pepper-grass	FACU
	Raphanus sativus	wild radish	UPL
	Rorippa nasturtium-aquaticum	water cress	OBL
	Sisymbrium officinale	hedge mustard	NI
Caryophyllaceae			
	Spergula arvensis ssp. arvensis	stickwort	
	Spergularia rubra	red sandspurry	FAC-
	Stellaria media	common chickweed	FACU
Chenopodiaceae			
	Atriplex patula	spear oracle	FACW
	Chenopodium album	white goosefoot	FAC
	Salsola tragus	tumbleweed	FACU
Convolvulaceae			
	Convolvulus arvensis	field bindweed	NI
	Cressa truxillensis	alkali weed	FACW
Cyperaceae			
	Carex barbarae	valley sedge	FACW
	Cyperus eragrostis	tall flatsedge	FACW
	Scirpus acutus var. occidentalis	common tule	OBL
	Scirpus americanus	American tule	OBL
	Scirpus robustus	big bulrush	OBL
Dipsacaceae			
	Dipsacus fullonum	wild teasel	FACW-
Equisetaceae			
	Equisetum laevigatum	smooth scouring rush	FACW
Euphorbiaceae			
	Chamaesyce serpyllifolia ssp. serpyllifolia	thyme-leafed spurge	NI
	Eremocarpus setigerus	turkey mullein	NI
Fabaceae			
	Genista monspessulana	French broom	NI
	Hoita macrostachya	leather root	OBL
	Lathyrus odoratus	sweet pea	NI
	Lotus corniculatus	bird's-foot trefoil	FAC
	Lotus humistratus	short-podded lotus	NI
	Lupinus bicolor	miniature lupine	NI
	Medicago polymorpha	California burclover	FACU-
	Melilotus alba	white sweetclover	
	Melilotus officinalis	yellow sweetclover	FACU
	Rupertia physodes	common rupertia	NI

Table 5.

Plant List for Highway Rights of Way
(Compiled by Virginia Dains, May 22 & June 23-26, 2003)

Family	Scientific Name	Common Name	Wetland Indicator
	Trifolium dubium	shamrock	FACU*
	Trifolium fucatum	bull clover	FAC
	Trifolium glomeratum	clustered clover	NI
	Trifolium hirtum	rose clover	NI
	Trifolium incarnatum	crimson clover	NI
	Vicia americana var. americana	American vetch	FACU*
	Vicia sativa	spring vetch	
	Vicia villosa	hairy vetch	
Fagaceae			
	Quercus agrifolia	coast live oak	NI
Frankeniaceae			
	Frankenia salina	alkali heath	FACW+
Gentianaceae			
	Centaurium davyi	Davy's centaury	FAC+
Geraniaceae			
	Erodium cicutarium	red-stemmed filaree	NI
	Geranium dissectum	cut-leaved geranium	NI
Hippocastanaceae			
	Aesculus californica	California buckeye	UPL
Juncaceae			
	Juncus balticus	Baltic rush	FACW+
	Juncus bufonius	toad rush	FACW+
	Juncus effusus	common bog rush	FACW+
	Juncus xiphioides	iris-leaved rush	OBL
Linaceae			
	Linum bienne	pale flax	NI
Lythraceae			
	Lythrum hyssopifolium	hyssop loosestrife	
Malvaceae			
	Malva parviflora	cheeseweed	NI
	Malvella leprosa	alkali mallow	FAC*
Myrtaceae			
	Eucalyptus globulus	blue gum	NI
Oleaceae			
	Olea europaea	olive	NI
Onagraceae			
	Epilobium brachycarpum	autumn willowweed	UPL
	Epilobium ciliatum ssp ciliatum	willowherb	FACW
	Epilobium cleistogamum	cleistogamous boisduvalia	OBL
Papaveraceae			

Table 5.

Plant List for Highway Rights of Way
(Compiled by Virginia Dains, May 22 & June 23-26, 2003)

Family	Scientific Name	Common Name	Wetland Indicator
	Eschscholzia californica	California poppy	NI
Plantaginaceae			
	Plantago major	common plantain	FAC
Poaceae			
	Agrostis avenacea	pacific bentgrass	FACW*
	Avena barbata	slender wild oats	NI
	Avena sativa	common oats	NI
	Briza maxima	big quaking grass	NI
	Briza minor	little quaking grass	FACU
	Bromus diandrus	ripgut brome	NI
	Cortaderia selloana	pampas grass	NI
	Crypsis schoenoides	swamp grass	OBL
	Cynodon dactylon	bermuda grass	FACU
	Dactylis glomerata	orchard-grass	FACU
	Distichlis spicata	saltgrass	FACW
	Elytrigia elongata	tall wheatgrass	NI
	Festuca arundinacea	tall fescue	FAC-
	Holcus lanatus	common velvetgrass	FAC
	Hordeum brachyantherum	meadow barley	FACW
	Hordeum murinum ssp. leporinum	foxtail barley	UPL
	Leymus triticoides	creeping wild-rye	FAC+
	Lolium perenne	English rye-grass	FAC*
	Paspalum dilatatum	dallis grass	FAC
	Phalaris aquatica	Harding grass	FAC
	Pleuropogon californicus	semaphore grass	OBL
	Polypogon interruptus	ditch beard grass	OBL
	Polypogon monspeliensis	annual beard grass	FACW+
	Sorghum halepense	Johnson grass	FACU
	Taeniatherum caput-medusae	Medusa-head	NI
	Triticum aestivum	common wheat	NI
	Vulpia myuros	rattail fescue	FACU*
Polygonaceae			
	Rumex acetosella	common sheep sorrel	FAC-
	Rumex crispus	curly dock	FACW-
Rosaceae			
	Rosa californica	California wild rose	FAC+
	Rubus discolor	Himalaya-berry	FAC+
Salicaceae			
	Salix babylonica	weeping willow	FACW-
	Salix laevigata	red willow	FACW+
	Salix lasiolepis	arroyo willow	FACW
Scrophulariaceae			
	Bellardia trixago	Mediterranean lineseed	NI

Table 5.

Plant List for Highway Rights of Way
(Compiled by Virginia Dains, May 22 & June 23-26, 2003)

Family	Scientific Name	Common Name	Wetland Indicator
	Kickxia elatine	fluellin	NI*
	Mimulus guttatus	common yellow monkeyflower	FACW+
	Parentucellia viscosa	yellow parentucellia	FAC
	Veronica anagallis-aquatica	water speedwell	OBL
	Veronica peregrina ssp. xalapensis	hairy purslane speedwell	OBL
	Veronica persica	bird's-eye speedwell	NI
Taxodiaceae			
	Sequoia sempervirens	coast redwood	NI
Typhaceae			
	Typha angustifolia	narrow-leaf cattail	OBL
	Typha latifolia	broadleaf cattail	OBL
Verbenaceae			
	Verbena hastata	swamp verbena	FACW
Vitaceae			
	Vitis vinifera	cultivated grape	UPL
Zannichelliaceae			
	Zannichellia palustris	horned pondweed	OBL
Zygophyllaceae			
	Tribulus terrestris	puncture-vine	NI

Table 6.

Animal Species Observed in the Project Area or Expected to Utilize the Project Area

TABLE 6. Animal Species Observed in the Project Area or Expected to Utilize the Project Area

(Includes observed wildlife and expected species from the adjacent stock pond.)

(1) *Documented as occurring in the project area by HBG during spring/early summer surveys*
(2) *Documented as occurring in the project area by CH2M Hill during winter surveys*

MAMMALS

Virginia Opossum	*Didelphis virginiana*
Broad-footed Mole [1]	*Scapanus latimanus*
Yuma Myotis	*Myotis yumanensis*
California Myotis	*Myotis californicus*
Western Pipistrelle	*Pipistrellus hesperus*
Big Brown Bat	*Eptesicus fuscus*
Red Bat	*Lasiurus borealis*
Pallid Bat	*Antrozous pallidus*
Brazilian Free-tailed Bat	*Tadarida brasiliensis*
Black-tailed Hare [1, 2]	*Lepus californicus*
Brush Rabbit	*Sylvilagus bachmani*
California Ground Squirrel [1]	*Spermophilus beecheyi*
Botta's Pocket Gopher [1]	*Thomomys bottae*
California Kangaroo Rat	*Dipodomys californicus*
Western Harvest Mouse	*Reithrodontomys megalotis*
Deer Mouse	*Peromyscus maniculatus*
California Vole [1, 2]	*Microtus californicus*
Norway Rat	*Rattus norvegicus*
House Mouse [2]	*Mus musculus*
Coyote [1, 2]	*Canis latrans*
Gray Fox	*Urocyon cinereoargenteus*
Raccoon	*Procyon lotor*
Long-tailed Weasel	*Mustela frenata*
Striped Skunk [1]	*Mephitis mephitis*
Bobcat	*Felis rufus*
Mule Deer [1, 2]	*Odocoileus hemionus*

REPTILES AND AMPHIBIANS

California Slender Salamander	*Batrachoseps attenuatus*
Western Toad [2]	*Bufo boreas*
Pacific Treefrog [1, 2]	*Hyla regilla*
California Red-legged Frog [2]	*Rana aurora draytonii*
Bullfrog [1, 2]	*Rana catesbeiana*
Western Fence Lizard [1, 2]	*Sceloporus occidentalis*
Coast Horned Lizard	*Phrynosoma coronatum*
Western Skink	*Eumeces skiltonianus*
Southern Alligator Lizard [1]	*Gerrhonotus multicarinatus*
Ringneck Snake	*Diadophis punctatus*

TABLE 6. Animal Species Observed in the Project Area or Expected to Utilize the Project Area

(Includes observed wildlife and expected species from the adjacent stock pond.)

(1) *Documented as occurring in the project area by HBG during spring/early summer surveys*
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Sharp-tailed Snake	*Contia tenuis*
Racer	*Coluber constrictor*
Coachwhip	*Masticophis flagellum*
Gopher Snake	*Pituophis melanoleucus*
Common Kingsnake	*Lampropeltis getulus*
Common Garter Snake	*Thamnophis sirtalis*
Western Terrestrial Garter Snake	*Thamnophis elegans*
Night Snake	*Hypsiglena torquata*
Western Rattlesnake	*Crotalis viridus*

TABLE 6. Animal Species Observed in the Project Area or Expected to Utilize the Project Area

(Includes observed wildlife and expected species from the adjacent stock pond.)

(1) *Documented as occurring in the project area by HBG during spring/early summer surveys*

(2) *Documented as occurring in the project area by CH2M Hill during winter surveys*

BIRDS

Pied-billed Grebe [1, 2]	*Podilymbus podceaps*
Eared Grebe	*Podiceps nigricollis*
American White Pelican [2]	*Pelecanus erythrorhynchos*
Double-crested Cormorant [1]	*Phalacrocorax auritus*
Great Blue Heron	*Ardea herodias*
Green Heron	*Butorides virescens*
Black-crowned Night Heron [1]	*Nycticorax nycticorax*
Great Egret	*Casmerodius albus*
Snowy Egret [1]	*Egretta thula*
Canada Goose [1]	*Branta canadensis*
Green-Winged Teal	*Anas crecca*
Mallard [1, 2]	*Anas platyrhyncos*
Northern Pintail	*Anas acuta*
Cinnamon Teal	*Anas cyanoptera*
Northern Shoveler	*Anas clyeata*
Gadwall [1]	*Anas strepera*
American Wigeon [2]	*Anas americana*
Canvasback	*Aythya valisineria*
Ring-necked Duck	*Aythya collaris*
Greater Scaup	*Aythya marila*
Lesser Scaup	*Aythya affinis*
Common Goldeneye	*Bucephala clangula*
Bufflehead	*Bucephala albeola*
Ruddy Duck [1]	*Oxyura jamaicensis*
Turkey Vulture [1, 2]	*Cathartes aura*
Osprey [1]	*Pandion haliaetus*
White-tailed Kite [2]	*Elanus caeruleus*
Northern Harrier [1]	*Circus cyaneus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperi*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk [1]	*Buteo jamaicensis*
Golden Eagle [1, 2]	*Aquila chrysaetos*
American Kestrel [1, 2]	*Falco sparverius*
Prairie Falcon	*Falco mexicanus*
Merlin	*Falco columbarius*
Ring-necked Pheasant [1]	*Phasianus colchicus*
California Quail	*Callipepla californica*
Virginia Rail	*Rallus limicola*

TABLE 6. Animal Species Observed in the Project Area or Expected to Utilize the Project Area

(Includes observed wildlife and expected species from the adjacent stock pond.)

(1) *Documented as occurring in the project area by HBG during spring/early summer surveys*

(2) *Documented as occurring in the project area by CH2M Hill during winter surveys*

Sora	*Porzana carolina*
Common Moorhen	*Gallinula chloropus*
American Coot [1, 2]	*Fulica Americana*
Black-bellied Plover	*Pluvialis squatarola*
Killdeer [1, 2]	*Charadrius vociferous*
Semipalmated Plover	*Charadrius semipalmatus*
Greater Yellowlegs	*Tringa melanoleuca*
Willet	*Catoptrophorus semipalmatus*
Spotted Sandpiper	*Actitus macularia*
Whimbrel	*Numenius phaeopus*
Long-billed Curlew [1]	*Numenius americanus*
Marbled Godwit	*Limosa fedoa*
Least Sandpiper	*Calidris minutilla*
Western Sandpiper	*Calidris mauri*
Dunlin	*Calidris alpina*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Wilson's Snipe [2]	*Gallinago delicata*
Mew Gull	*Larus Canus*
Ring-billed Gull	*Larus delawarensis*
California Gull [2]	*Larus californicus*
Herring Gull	*Larus argentatus*
Forster's Tern	*Sterna forsteri*
Caspian Tern [1]	*Sterna caspia*
Rock Dove [1]	*Columba livia*
Mourning Dove [1]	*Zenaida macroura*
Band-tailed Pigeon [1]	*Columba fasciata*
Barn Owl	*Tyto alba*
Great Horned Owl [1]	*Bubo virginianus*
Burrowing Owl [2]	*Athene cunicularia*
Western Screech-owl	*Otus kennicottii*
White-throated Swift [1]	*Aeronautes saxatalis*
Vaux's Swift [1]	*Chaetura vauxi*
Anna's Hummingbird [1]	*Calypte annas*
Allen's Hummingbird [1]	*Selasphorus sasin*
Belted Kingfisher	*Ceryle alcyon*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Northern Flicker	*Colaptes auratus*
Nuttall's Woodpecker	*Picoides nuttallii*
Hairy Woodpecker	*Picoides villosus*
Downy Woodpecker	*Dendrocopos pubescens*
Black Phoebe [1]	*Sayornis nigricans*

TABLE 6. Animal Species Observed in the Project Area or Expected to Utilize the Project Area

(Includes observed wildlife and expected species from the adjacent stock pond.)

(1) *Documented as occurring in the project area by HBG during spring/early summer surveys*

(2) *Documented as occurring in the project area by CH2M Hill during winter surveys*

Say's Phoebe [2]	*Sayornis saya*
Olive-sided Flycatcher	*Contopus borealus*
Western Wood-pewee	*Contopus sordidulis*
Pacific-slope Flycatcher	*Empidonax difficilis*
Ash-throated Flycatcher [1]	*Myiarchus cinerascens*
Western Kingbird [1]	*Tyrannus verticalis*
California Horned Lark [1]	*Eremophila alpestris actica*
Barn Swallow [1, 2]	*Hirundo rustica*
Cliff Swallow [1, 2]	*Petrochelidon pyrrhonota*
Tree Swallow [1]	*Tachicineta bicolor*
Violet-green swallow [1]	*Tachycineta thalassina*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Western Scrub-jay	*Aphelocoma californica*
Common Raven [1, 2]	*Corvus corax*
American Crow [2]	*Corvus brachyrhynchos*
Oak Titmouse	*Baeolophus inornatus*
Common Bushtit	*Psaltriparus minimus*
White-breasted Nuthatch	*Sitta carolinensis*
Bewick's Wren	*Thryomanes bewickii*
House Wren	*Troglodytes aedon*
Winter Wren	*Troglodytes troglodytes*
Marsh Wren	*Cistothorus palustris*
American Robin [2]	*Turdus migratorius*
Hermit Thrush	*Hylocichla guttata*
Swainson's Thrush	*Catharus ustulatus*
Western Bluebird [1]	*Sialia mexicana*
Blue-gray Gnatcatcher	*Polioptila caerula*
Ruby-crowned Kinglet	*Regulus calendula*
Northern Mockingbird [1]	*Mimus polyglottos*
American Pipit	*Anthus rubescens*
Cedar Waxwing	*Bombycilla cedrorum*
Loggerhead Shrike [1]	*Lanius ludovicianus*
European Starling [1, 2]	*Sturnus vulgaris*
Hutton's Vireo	*Vireo huttoni*
Orange-crowned Warbler	*Vermivora celata*
Nashville Warbler	*Vermivora ruficapilla*
Yellow Warbler	*Dendroica petechia*
Yellow-rumped Warbler	*Dendroica coronata*
Townsend's Warbler	*Dendroica townsendi*
Black-throated Gray Warbler	*Dendroica nigrescens*
Common Yellowthroat	*Geothlypis trichas*

TABLE 6. Animal Species Observed in the Project Area or Expected to Utilize the Project Area

(Includes observed wildlife and expected species from the adjacent stock pond.)

(1) *Documented as occurring in the project area by HBG during spring/early summer surveys*
(2) *Documented as occurring in the project area by CH2M Hill during winter surveys*

Wilson's Warbler	*Wilsonia pusilla*
Western Tanager	*Piranga ludoviciana*
Black-headed Grosbeak	*Pheucticus melanocephalus*
Lazuli Bunting	*Passerina amoena*
Spotted Towhee	*Pipilo maculatus*
California Towhee [1]	*Pipilo crissalis*
Chipping Sparrow	*Spizella passerina*
Savannah Sparrow [1]	*Passerculus sandwichensis*
Lark Sparrow [2]	*Chondestes grammacus*
White-crowned Sparrow [2]	*Zonotrichia leucophrys*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
Fox Sparrow	*Passerella iliaca*
Song Sparrow [1]	*Melospiza melodia*
Lincoln's Sparrow	*Melospiza lincolnii*
Dark-eyed Junco	*Junco hyemalis*
Western Meadowlark [1, 2]	*Sturnella neglecta*
Red-winged Blackbird [1]	*Agelaius phoeniceus*
Brewer's Blackbird [1, 2]	*Euphagus cyanocephalus*
Brown-headed Cowbird [1]	*Molothrus ater*
Bullock's Oriole	*Icterus bullockii*
Purple Finch	*Carpodacus purpureus*
House Finch [1]	*Carpodacus mexicanus*
Pine Siskin	*Carduelis pinus*
American Goldfinch [1]	*Spinus tristis*
Lesser Goldfinch	*Spinus psaltria*
House Sparrow [1]	*Passer domesticus*

Stebbins (1985)
National Geographic Society (2000)
Robbins et al (1966)
Peterson (1969)
Burt and Grossenheider (1976)
Mayer and Laudenslayer (1988)
Zeiner, et al. (1990)

Table 7.

Status, Distribution, and Habitat of Special Status Plants With Potential to Occur in the Vicinity of the Project Area

Table 7. Status, Distribution, and Habitat of Special-Status Plants With Potential to Occur in the Vicinity of the Project Area, Sonoma County, California.

Species **Common Name**[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period
Alopecurus aequalis var *sonomensis* Sonoma alopecurus	Endangered	None	3-3-3 List 1B	Freshwater marshes and swamps, riparian scrub	MRN, SON	May-July
Amorpha californica var. *napensis* Napa false indigo	None	None	2-2-3 List 1B	Broadleafed upland forest, chaparral, cismontane woodland	MNT, MRN, NAP, SON	April-July
Arabis blepharophylla coast rock cress	None	None	1-1-3 List 4	Rocky places in broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub	CCA, MNT, MRN, SCR, SFO, SMT, SON	February-May
Aster lentus Suisun Marsh aster	None	None	2-2-3 List 1B	Brackish and freshwater marshes and swamps	CCA, NAP, SAC, SJQ, SOL	May-November
Astragalus breweri Brewer's milk-vetch	None	None	1-2-3 List 4	Chaparral, cismontane woodland, meadows, valley and foothill grassland, often serpentinite or volcanic soil	COL, LAK, MEN, MRN, NAP, SON, YOL	April-June
Astragalus rattanii var. *rattanii* Rattan's milk-vetch	None	None	1-1-3 List 4	Gravelly streambanks, chaparral, cismontane woodland, lower montane coniferous forest	COL, GLE, HUM, LAK, MEN, SON, TEH, TRI	April-July
Astragalus tener var. *tener* alkali milk-vetch	None	None	3-2-3 List 1B	Alkaline or adobe clay soil, playas, valley and foothill grassland, vernal pools	ALA, CCA*, MER, MNT*, NAP, SBT*, SCL*, SFO*, SJQ*, SOL, SON*, STA*, YOL	March-June
Atriplex joaquiniana San Joaquin spearscale	None	None	2-2-3 List 1B	Alkaline soil, chenopod scrub, meadows, playas, valley and foothill grassland	ALA, CCA, COL, GLE, MER, MNT, NAP, SAC, SBT, SCL*, SJQ*, SOL, TUL*, YOL	April-October

Table 7. Status, Distribution, and Habitat of Special-Status Plants With Potential to Occur in the Vicinity of the Project Area, Sonoma County, California.

Species **Common Name**[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period
Blennosperma bakeri Sonoma sunshine	Endangered	Endangered	2-3-3 List 1B	Vernal pools, mesic valley and foothill grassland	SON	March-May
Brodiaea californica var. *leptandra* narrow-anthered California brodieaea	None	None	2-2-3 List 1B	Broad-leafed upland forest, chaparral, lower montane coniferous forest	LAK, NAP, SON	May-July
Calandrinia breweri Brewer's calandrinia	None	None	1-2-2 List 4	Chaparral, coastal scrub in sandy or loamy soil, often on burns or disturbed sites	CCA, LAX, MEN, MNT, MPA, MRN, NAP, SBA, SBD, SCL, SCR, SCZ, SDG, SLO, SMT, SON, SRO, VEN, Baja Calif.	March-June
Carex buxbaumii Buxbaum's sedge	None	None	1-2-1 List 4	Bogs and fens, mesic meadows, marshes and swamps	GLE, HUM, INY, MRN, PLU, SHA, SIS, SON, TEH, TUL, TUO; widespread outside Calif.	March-August
Ceanothus gloriosus var. *exaltatus* glory brush	None	None	1-1-3 List 4	Chaparral	MEN, MRN, SON	March-May
Ceanothus gloriosus var. *gloriosus* Point Reyes ceanothus	None	None	1-1-3 List 4	Sandy soil, coastal bluff scrub, closed-cone coniferous forest, coastal dunes, coastal scrub	MEN, MRN, SON	March-May
Ceanothus sonomensis Sonoma ceanothus	None	None	3-2-3 List 1B	Sandy volcanic or serpentine soils, chaparral	NAP, SON	February-April
Chorizanthe valida Sonoma spineflower	Endangered	Endangered	3-3-3 List 1B	Sandy soil, coastal prairie	MRN, SON*	June-August
Cordylanthus maritimus ssp *palustris* Point Reyes bird's-beak	None	None	2-2-2 List 1B	Coastal salt marshes	ALA*, HUM, MRN, SCL*, SMT*, SON, Oregon	June-October

Table 7. Status, Distribution, and Habitat of Special-Status Plants With Potential to Occur in the Vicinity of the Project Area, Sonoma County, California.

Species **Common Name**[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period
Cordylanthus mollis ssp *mollis* soft bird's-beak	Endangered	Rare	3-2-3 List 1B	Coastal salt marshes	CCA, MRN*, NAP, SAC*, SOL, SON*	July-November
Cypripedium californicum California lady's-slipper	None	None	1-2-2 List 4	Bogs and fens, seeps and streambanks in lower montane coniferous forest	BUT, DNT, HUM, MEN, MRN*, PLU, SHA, SIS, SON, TRI, Oregon	April-August
Downingia pusilla dwarf downingia	None	None	1-2-1 List 2	Vernal pools, mesic valley and foothill grassland	MER, MPA, NAP, PLA, SAC, SOL, SON, STA, TEH, YUB, South America	March-May
Eleocharis parvula small spikerush	None	None	1-1-1 List 4	Coastal salt marshes, other wet, generally saline habitats	BUT, CCA, GLE, HUM, NAP, ORA, SIS, SLO, SON, VEN, Oregon, Washington, etc.	June-September
Elymus californicus California bottlebrush grass	None	None	1-1-3 List 4	Cismontane woodland, north coast coniferous forest, broadleafed upland forest, riparian woodland	MNT?, MRN, SCR, SMT, SON	May-November
Erigeron bioletti streamside daisy	None	None	?-?-3 List 3	Rocky, mesic areas in broadleafed upland forest, cismontane woodland, north coast coniferous forest	HUM, MEN, MRN, NAP, SOL, SON	June-September
Erysimum franciscanum San Francisco wallflower	None	None	1-2-3 List 4	Chaparral, coastal dunes, coastal scrub, valley and foothill grassland, often serpentinite or granitic substrate	MRN, SCL, SCR, SFO, SMT, SON	March-June
Fritillaria liliacea fragrant fritillary	None	None	1-2-3 List 1B	Heavy clay soil, cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland	ALA, CCA, MNT, MRN, SBT, SCL, SFO, SMT, SOL, SON	February-April

Table 7. Status, Distribution, and Habitat of Special-Status Plants With Potential to Occur in the Vicinity of the Project Area, Sonoma County, California.

Species **Common Name**[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period
Helianthella castanea Diablo helianthella	None	None	2-2-3 List 1B	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland.	ALA, CCA, MRN*, SFO*, SMT	April-June
Hemizonia congesta ssp *leucocephala* hayfield tarplant	None	None	?-?-3 List 3	Coastal scrub, valley and foothill grassland	MEN, MRN, SON	April-October
Holocarpha macradenia Santa Cruz tarplant	Threatened	Endangered	3-3-3 List 1B	Coastal prairie, valley and foothill grassland, coastal scrub, often in clay soils	ALA*, CCA*, MNT, MRN*, SCR	June-October
Lasthenia conjugens Contra Costa goldfields	Endangered	None	3-3-3 List 1B	Moist sites, valley and foothill grassland, vernal pools cismontane woodland, alkaline playas	ALA, CCA, MEN*, MNT, NAP, SBA*, SCL*, SOL	March-June
Lathyrus jepsonii var. *jepsonii* Delta tule pea	None	None	2-2-3 List 1B	Freshwater and brackish marshes	ALA, CCA, NAP, SAC, SCL*, SJQ, SOL	May-September
Legenere limosa legenere	None	None	2-3-3 List 1B	Vernal pools	LAK, NAP, PLA, SAC, SHA, SMT, SOL, SON*, STA*, TEH, YUB	April-June
Lessingia hololeuca woolly-headed lessingia	None	None	?-?-3 List 3	Clay or serpentinite soil, broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland	ALA, MNT, MRN, NAP, SCL, SMT, SOL, SON, YOL	June-October
Lilaeopsis masonii Mason's lilaeopsis	None	Rare	2-3-3 List 1B	Brackish and freshwater marshes and swamps, riparian scrub	ALA, CCA, NAP, SAC, SJQ, SOL	April-November

Table 7. Status, Distribution, and Habitat of Special-Status Plants With Potential to Occur in the Vicinity of the Project Area, Sonoma County, California.

Species **Common Name**[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period
Lilium rubescens redwood lily	None	None	1-2-3 List 4	Broadleafed upland forest, chaparral, lower montane coniferous forest, upper montane coniferous forest	DNT, HUM, LAK, MEN, NAP, SCR*, SHA, SIS, SON, TRI	June-August
Linanthus acicularis bristly linanthus	None	None	1-2-3 List 4	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland	ALA, BUT, CCA [?], FRE, HUM, LAK, MEN, MRN, NAP, SMT, SON	April-July
Linanthus grandiflorus large-flower linanthus	None	None	1-2-3 List 4	Coastal scrub, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, valley and foothill grassland, usually in sandy soil	ALA, KRN, MAD, MER, MNT, MRN, SBA*, SCL, SCR, SFO, SLO, SMT, SON	April-August
Linanthus jepsonii Jepson's linanthus	None	None	2-2-3 List 1B	Chaparral, cismontane woodland, open to partially shaded grassy slopes, on volcanics or periphery of serpentine substrates	LAK, NAP, SON	April-May
Lomatium repostum Napa lomatium	None	None	1-1-3 List 4	Chaparral, cismontane woodland, often serpentinite	LAK, NAP, SOL, SON	March-June
Micropus amphibolus Mt. Diablo cottonweed	None	None	?-2-3 List 3	Rocky areas in broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland, coastal scrub	ALA, CCA, COL, LAK, MNT, MRN, NAP, SBA, SCL, SCR, SOL, SON	March-May
Monardella undulata curly-leaved monardella	None	None	1-2-3 List 4	Sandy soil, maritime chaparral, coastal dunes, coastal prairie, coastal scrub, ponderosa pine sandhills, closed-cone coniferous forest	MNT, MRN, SBA, SCR, SFO, SLO, SMT, SON	May-September

Table 7. Status, Distribution, and Habitat of Special-Status Plants With Potential to Occur in the Vicinity of the Project Area, Sonoma County, California.

Species **Common Name**[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period
Navarretia cotulifolia cotula navarretia	None	None	1-2-3 List 4	Adobe soil, chaparral, cismontane woodland, valley and foothill grassland	ALA, BUT, CCA, COL, GLE, LAK, MEN, MRN, NAP, SBT, SCL, SIS?, SOL, SON, SUT, YOL	May-June
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	None	None	2-3-3 List 1B	Moist areas, adobe or alkaline soils; cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest	COL, LAK, MEN, MRN, NAP, SOL, SON, TEH	May-July
Perideridia gairdneri ssp. *gairdneri* Gairdner's yampah	None	None	1-2-3 List 4	Moist sites in coastal prairie, broadleafed upland forest, chaparral, valley and foothill grassland, vernal pools	CCA, KRN, LAX*, MEN, MNT, MRN, NAP, ORA*, SBT, SCL, SCR, SDG*, SLO, SMT(*?), SOL, SON	June-October
ia candida white-flowered rein orchid	None	None	1-1-1 List 4	Broadleafed upland forest, lower montane coniferous forest, north coast coniferous forest	DNT, HUM, MEN, SCR, SIS, SMT, SON, TRI, Oregon, Washington, etc.	May-September
Pityopus californicus California pinefoot	None	None	1-2-1 List 4	Broadleafed upland forest, lower montane coniferous forest, north coast coniferous forest, upper montane coniferous forest	DNT, FRE, HUM, MEN, MPA, MRN(*?), NAP, SIS, SON, TUL, Oregon, Washington	May-August
Polygonum marinense Marin knotweed	None	None	3-3-3 List 1B	Coastal salt or brackish marshes	MRN, NAP, SOL, SON	April-October
Ranunculus lobbii Lobb's aquatic buttercup	None	None	1-2-3 List 4	Vernal pools; seasonally wet sites in cismontane woodland, north coast coniferous forest, valley and foothill grassland	ALA, CCA, MEN, MRN, NAP, SCL, SOL, SON, Oregon, other states	February-May

Table 7. Status, Distribution, and Habitat of Special-Status Plants With Potential to Occur in the Vicinity of the Project Area, Sonoma County, California.

Species **Common Name**[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Distribution by County[6]	Flowering Period
Ribes victoris Victor's gooseberry	None	None	1-1-3 List 4	Broadleafed upland forest, chaparral	MEN, MRN, NAP, SOL, SON	March-April
Senecio aphanactis rayless ragwort	None	None	3-2-1 List 2	Alkaline soil, chaparral, cismontane woodland, coastal scrub, valley and foothill grassland	ALA, CCA, FRE, LAX, MER, ORA, RIV, SBA, SCL, SCT, SCZ, SDG, SLO, SOL, SRO, VEN, Baja Calif.	January-April
ria littoralis beach starwort	None	None	1-2-3 List 4	Moist places; bogs and fens, coastal bluff scrub, coastal dunes, coastal scrub, marshes and swamps	HUM, MEN*, MRN, SFO, SON	March to July
Trifolium amoenum showy Indian clover	Endangered	None	3-3-3 List 1B	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite)	ALA*, MRN, NAP*, SCL*, SOL*, SON(*?)	April-June
Trifolium depauperatum var. *hydrophilum* saline clover	None	None	3-2-3 List 1B	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools	ALA, COL?, MNT, NAP, SBT, SCL, SLO, SMT, SOL, SON	April-June
Triteleia lugens dark-mouthed triteleia	None	None	1-1-3 List 4	Broadleafed upland forest, chaparral, lower montane coniferous forest	LAK, MNT, NAP, SBT, SOL, SON	April-June
Veratrum fimbriatum fringed false-hellebore	None	None	1-1-3 List 4	Moist places, bogs and fens, coastal scrub, meadows, north coast coniferous forest	MEN, SON	July-September
Zigadenus micranthus var *fontanus* marsh zigadenus	None	None	1-2-3 List 4	Vernally moist places in chaparral, cismontane woodland, lower montane coniferous forest, meadows, marshes and swamps, often serpentinite	LAK, MEN, MNT, MRN, NAP, SBT, SCR, SLO, SMT, SON	April-July

[1]Nomenclature follows Hickman (1993), Tibor (2001), and California Native Plant Society (2003).

Table 7. Status, Distribution, and Habitat of Special-Status Plants With Potential to Occur in the Vicinity of the Project Area, Sonoma County, California.

[2]U.S. Fish and Wildlife Service (2003a, b, c).
[3]Section 1904, California Fish and Game Code (California Department of Fish and Game 2003).
[4] Tibor (2001) and California Native Plant Society (2001).
Top line: CNPS R-E-D (Rarity-Endangerment-Distribution) code. Rarity: 1=Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time; 2=Occurrence confined to several populations or to one extended population; 3=Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported. Endangerment: 1=Not endangered; 2=Endangered in a portion of its range; 3=Endangered throughout its range. Distribution: 1=More or less widespread outside California; 2=Rare outside California; 3=Endemic to California. Bottom Line: CNPS List. List 1B: Rare, Threatened, or Endangered in California and elsewhere. List 2: Rare, Threatened, or Endangered in California, more common elsewhere. List 3: Plants about which more information is needed. List 4: Plants of limited distribution: a watch list.
[5]Munz and Keck (1973), Hickman (1993), Best et. al. 1996, Tibor (2001), California Native Plant Society (2001), and unpublished information.
[6]Tibor (2001), California Native Plant Society (2001), and unpublished information; counties abbreviated by a three-letter code (below); occurrence in other states or areas as indicated.

ALA: Alameda
BUT: Butte
CCA: Contra Costa
COL: Colusa
DNT: Del Norte
FRE: Fresno
GLE: Glenn
HUM: Humboldt
INY: Inyo
KRN: Kern
LAK: Lake
LAX: Los Angeles
MAD: Madera
MEN: Mendocino
MER: Merced
MNT: Monterey
MPA: Mariposa
MRN: Marin
NAP: Napa
ORA: Orange
PLA: Placer
PLU: Plumas
RIV. Riverside
SAC: Sacramento
SBA: Santa Barbara
SBD: San Bernardino
SBT: San Benito
SCL: Santa Clara
SCR: Santa Cruz
SCT: Santa Catalina Island (LAX Co.)
SCZ: Santa Cruz Island (SBA Co.)
SDG: San Diego
SFO: San Francisco
SHA: Shasta
SIS: Siskiyou
SJQ: San Joaquin
SLO: San Luis Obispo
SMT: San Mateo
SOL: Solano
SON: Sonoma
SRO: Santa Rosa Island (SBA Co.)
STA: Stanislaus
SUT: Sutter
TEH: Tehama
TRI: Trinity
TUL: Tulare
TUO: Tuolumne
VEN. Ventura
YOL: Yolo
YUB: Yuba

* Presumed extinct in these counties or states.

Table 8.

Special Status Animal Species That Have Been Reported In The Sears Point and Petaluma Point USGS Quadrangles (7.5-Minute Series)

Table 8. Special Status Animal Species that have been reported in the Sears Point and Petaluma Point USGS Quadrangles (7.5-Minute Series)[1]

SPECIES	STATUS FED/STATE/ CNPS[2]	HABITAT	OCCURRENCE ON THE PROJECT SITE
Callippe Silverspot Butterfly (*Speyeria callippe callippe*)	FE/--	Coastal grassland; host plant is *Viola pedunculata.*	Present. Species observed in suitable habitat during 2003 surveys in the North Section. All habitats to be included within areas planned as open space preserve. Also known from 1991-1993 documentation, 1.5 miles north of Lakeville Highway and Highway 37; 2 miles WNW of Sears Point (Highway 37 and Tolay Creek), primarily west side of Sonoma mountains ridge line.
Myrtle's Silverspot Butterfly (*Speyeria zerene myrtleae*)	FE/--	Coastal hills; larvae feed on *viola adunca*	Possible. Habitat is present in the North Section within areas planned as open space preserve; however, the species was not observed during 2003 surveys. Known from 1991 documentation, 2 miles north of the junction of Lakeville Highway and highway 37.
Opler's Longhorn Moth (*Adela oplerella*)	FSC/--	Serpentine grassland; larvae feed on *Platystemon californicus.*	Possible. Habitat may be present in the North Section. Known from 1991 documentation, 2 miles north of the junction of Lakeville Highway and Highway 37.
Sacramento Splittail (*Pogonichthys macrolepidatus*)	FT/--	Now confined to the Delta, Suisun Bay and associated marshes. Prefers slow-moving river sections and dead-end sloughs. Requires flooded vegetation for spawning and foraging for young.	Possible. Appropriate habitat may be present on site in salt marsh in the South Section of the project area. Has occurred at Carl's Marsh near the mouth of the Petaluma River, south of Highway 37.

Table 8. Special Status Animal Species that have been reported in the Sears Point and Petaluma Point USGS Quadrangles (7.5-Minute Series)[1]

SPECIES	STATUS FED/STATE/ CNPS[2]	HABITAT	OCCURRENCE ON THE PROJECT SITE
California Tiger Salamander (*Ambystoma californiense*)	FC[3]/CSC	Found in annual grasslands and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water source for breeding.	Unlikely. No California tiger salamanders were observed and the assessment of onsite habitats indicates that there is limited aestivation habitat onsite.
California Red-legged Frog (*Rana aurora draytonii)*	FT/CSC	Mostly found in lowlands and foothills in/near permanent sources of deep water but will disperse far during and after rain. Prefers shorelines with extensive vegetation. Requires 11-20 weeks of permanent water for larval development and requires access to aestivation habitat.	Present. The species is documented as occurring at the site, and habitat occurs in the North, Middle and West sections including the development site. Mitigation for development impacts to known and potential breeding habitata, as well as dispersal corridors and refugial habitats, would need to be developed under a Section 7 consultation with USFWS.
Northern Harrier (*Circus cyaneus)* [nesting]	-/CSC	Coastal salt marsh and freshwater marsh; nests and forages in grasslands; nests on ground in shrubby vegetation, usually at marsh edge.	Nesting unlikely. Appropriate nesting habitat not present on site. Species likely forages on or near the site, especially in winter. Observed by HBG in May 2003.
White-tailed Kite (*Elanus caeruleus*) [nesting]	-/CFP	Open grassland and agricultural areas throughout Central California.	Nesting unlikely. Appropriate nesting habitat not present on site. Species likely forages on or near the site, especially in winter.
Sharp-shinned Hawk (*Accipiter striatus)* [nesting]	-/CSC	Breeds in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats. Prefers, but not restricted to, riparian habitats. North facing slopes, with plucking perches are critical requirements. All habitats except alpine, open prairie, and bare desert used in winter.	Nesting unlikely. Appropriate nesting habitat not present on site Species likely forages on or near the site, especially in winter.

Table 8. Special Status Animal Species that have been reported in the Sears Point and Petaluma Point USGS Quadrangles (7.5-Minute Series)[1]

SPECIES	STATUS FED/STATE/ CNPS[2]	HABITAT	OCCURRENCE ON THE PROJECT SITE
Cooper's Hawk (*Accipiter cooperii*) [nesting]	-/CSC	Nests primarily in deciduous riparian forests; forages in open woodlands.	Nesting unlikely. Appropriate nesting habitat not present on site. Species likely forages on or near the site, especially in winter.
Ferruginous Hawk (*Bueto regalis*) [wintering]	FSC/CSC	Inhabits open country. Winters in small number along California coast and inland valleys.	Wintering possible. The site likely receives sporadic use by the species as a winter foraging habitat.
Golden Eagle (*Aquila chrysaetos*) [nesting and wintering]	-/CSC	Typically frequents rolling foothills, mountain areas, sage-juniper flats and desert.	Wintering possible. The species likely utilizes the site as a winter foraging habitat, and forages over the site during the nesting season. Observed by HBG in May 2003.
Prairie Falcon (*Falco mexicanus*) [nesting]	-/CSC	Associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields and desert scrub. Permanent resident and migrant along inner coast and ranges.	Nesting unlikely. Appropriate nest sites not present. This species likely receives sporadic use by the species for foraging in winter.
Burrowing Owl (*Athene cunicularia*)	FSC/CSC	Found in open dry annual or perennial grasslands, deserts and scrublands characterized by low growing vegetation. This species is a subterranean nester, dependent upon the burrows of burrowing mammals, most notably the California Ground Squirrel.	Present. Burrowing owls were observed during site surveys conducted during the winter of 2003 in the North Section within areas planned as open space preserve.
Merlin (*Falco columbarius)* [wintering]	-/CSC	Breeds in Canada, winters in a variety of California habitats, including grasslands, savannahs, wetlands, etc.	Wintering possible. The species may utilize the site as a winter foraging habitat.

Table 8. Special Status Animal Species that have been reported in the Sears Point and Petaluma Point USGS Quadrangles (7.5-Minute Series)[1]

SPECIES	STATUS FED/STATE/ CNPS[2]	HABITAT	OCCURRENCE ON THE PROJECT SITE
California Clapper Rail (*Rallus longirostris obsoletus*)	FE/CE	Found in saltwater marshes traversed by tidal sloughs in the vicinity of San Francisco Bay; associated with abundant growths of pickleweed; feeds on mollusks obtained from mud bottomed sloughs.	Possible. Appropriate habitat is not present on the development site but may be present in salt marsh located at the south end of the project area. Documented in Lower Tubbs Island and adjacent marshes.
California Black Rail (*Laterallus jamaicensis coturniculus*)	FSC/CT	Mainly inhabits salt-marshes bordering larger bays. Occurs in tidal salt marsh with dense growths of pickleweed; also occurs in freshwater and brackish marshes.	Possible. Appropriate habitat is not present on the development site but may be present in salt marsh located at the south end of the project area. Documented at Tubbs Island and Tolay Creek.
California Horned Lark (*Eremophila alpestris actia*)	-/CSC	Resident in a variety of open habitats, including grasslands, less common in mountain regions.	Present. The species was observed on site by HBG in May 2003 and nesting by the species in the West section at the proposed development site was documented.
Loggerhead Shrike (*Lanius ludovicianus*)	FSC/CSC	Habitat includes open areas such as desert, grasslands and savannah. Nests in thickly foliaged trees or tall shrubs. Forages in open habitats, which contain trees, fence posts, utility poles, and other perches.	Present. The species was observed on the North portion of the site in May 2003, and is suspected of nesting in a riparian canyon.
Saltmarsh Common Yellowthroat (*Geothlypis trichas sinuosa*)	FSC/CSC	Requires thick continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	Possible. Appropriate nesting habitat not present on the development site but may be present in the South section within vegetated drainage ditches and salt marsh habitat. Closest breeding site is at Lower Tubbs Island near the mouth of Tolay Creek.
Yellow Warbler (*Dendroica petechia*) [nesting]	-/CSC	Breeds in deciduous riparian woodlands, widespread during fall mitigation.	Nesting unlikely. No breeding habitat on site, migrants expected on site, especially in fall.

Table 8. Special Status Animal Species that have been reported in the Sears Point and Petaluma Point USGS Quadrangles (7.5-Minute Series)[1]

SPECIES	STATUS FED/STATE/ CNPS[2]	HABITAT	OCCURRENCE ON THE PROJECT SITE
Tri-colored Blackbird (*Agelaius tricolor*) [nesting colony]	FSC/CSC	Breeds near freshwater, usually in tall emergent vegetation Requires open water with protected nesting substrate. Colonies prefer heavy growth of cattails and tules. Uses grasslands and agricultural lands for foraging.	Nesting possible. Appropriate nesting habitat present in an immediately adjacent stock pond, near the North section, where a nesting colony was documented in 1997. This colony was determined to be inactive in 2003. Utilization of adjacent stock pond for nesting is possible in the future.
Pallid Bat (*Autrozous pallidus*)	-/CSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Possible. Observed in 1990 in a barn just east of Highway 116, 1.5 miles north of Highway 37, adjacent to the North section of the project area.
Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*)	FE/CE	Inhabits saline emergent wetlands in the San Francisco Bay and its tributaries. Pickleweed is the primary habitat.	Possible. Appropriate habitat not present on development site but may be present in salt marsh at the south end of the project area. Nearest known population is at Lower Tubbs Island and adjacent marshes.
Suisun Shrew (*Sorex ornatus sinuosus*)	FSC/CSC	Occurs in tidal marshes along San Pablo Bay and Suisun Bay. Requires dense low-lying cover and driftwood and other litter above the mean high tide line for nesting and foraging.	Possible. Appropriate habitat not present on the development site, but may be present in salt marsh at the south end of the project area.

Table 8. Special Status Animal Species that have been reported in the Sears Point and Petaluma Point USGS Quadrangles (7.5-Minute Series)[1]

1.Source: California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Game for the Sears Point and Petaluma Point 7.5 Minute Quadrangle Maps, information dated May 2006.
2.Status Codes:

FE	Federally Endangered
FT	Federally Threatened
FPE	Federally Proposed Endangered
FPT	Federally Proposed Threatened
FSC	Federal Species of Concern (most are former C2 Candidates and some former C1)
CE	California Endangered
CT	California Threatened
CR	California Rare
CFP	California Fully Protected
CSC	California Species of Special Concern

APPENDIX A

Butterfly Study Report

Richard A. Arnold, Ph D
President

Entomological Consulting Services, Ltd.

104 Mountain View Court, Pleasant Hill, CA 94523 • (925) 825-3784 • FAX 827-1809
bugdctr@home.com • www.ecsltd.com
New email address: bugdctr@comcast.net

31 August 2003

Terry Huffman, Ph.D.
The Huffman-Broadway Group, Inc.
700 Larkspur Landing Circle, Suite 100
Larkspur, CA 94939

Re: Sonoma Project Site
Report on Myrtle's and Callippe Silverspot Butterflies

Dear Terry:

This letter reports on the findings of my surveys for the endangered Myrtle's and Callippe Silverspot butterflies at the 2,082-acre property located in southern Sonoma County at the junction of Lakeville Highway and Highway 37. This site is sovereign land of the Federated Indians of the Graton Rancheria.

Briefly, I can summarize the findings of my surveys by stating that the Callippe Silverspot was observed in the grassy hills of the northern portion of the site, while the Myrtle's Silverspot was not found at the property. A closely-related subspecies, the Sonoma Silverspot, was observed at the property. The remainder of this letter provides pertinent background information on these silverspots, plus describes my survey methods and findings in more detail.

BACKGROUND INFORMATION

Myrtle's Silverspot.

Historically, Myrtle's Silverspot was known from scattered coastal locations between San Mateo County to the mouth of the Russian River in Sonoma County (U.S. Fish & Wildlife Service 1992). Populations of this silverspot were associated with coastal terrace prairie, stabilized coastal dunes, and grassland habitats. It was originally collected at San Mateo in 1919, but has not been seen on the San Francisco Peninsula for over 50 years.

In contrast to information presented by the U.S. Fish & Wildlife Service (1992) when it recognized the Myrtle's Silverspot as an endangered species, recent taxonomic studies suggest that the subspecies *Speyeria zerene myrtleae* may actually be extinct. Emmel and Emmel (1998) decided that *S. zerene* populations located north of the Golden Gate Bridge were sufficiently different in appearance from those that occurred south of the bridge to be recognized as a new subspecies, *Speyeria zerene puntareyes*. This restricted the geographic range of *S. zerene*

myrtleae to the San Francisco Peninsula, where it has not been seen for decades and is presumed to be extinct.

Inland populations of *S. zerene* from Sonoma County were previously recognized as the subspecies *myrtleae*. However, in 1998 Emmel, Emmel, and Mattoon (1998) determined that these interior populations represented a new subspecies, *S. zerene sonomensis*, which is commonly known as the Sonoma Silverspot. The differences in appearance between *myrtleae*, *puntareyes*, and *sonomensis* are based on the ground color, degree of silver spotting, and darkness of the maculations. These features in *Speyeria* are normally quite variable, so a taxonomic determination must be based on examination of several individuals within a population to differentiate these three subspecies.

The California Natural Diversity Data Base (2003) lists a record of *Speyeria zerene myrtleae* from two miles north of the junction of Lakeville Highway and Highway 37, which is approximately 0.5 miles north of the project area. However, this is the type locality of the new subspecies *sonomensis* and this record actually refers to specimens that are part of the type series for this new subspecies (Emmel, Emmel, and Mattoon 1998).

All three of these subspecies of *Speyeria zerene* are primarily associated with grasslands. Their larval food plant is probably *Viola adunca*, but they may also utilize *Viola pedunculata* (Violaceae). Adults wander widely, especially to find nectar, to escape the fog that often lingers along the immediate coast, and for shelter from the blustery on-shore winds. Thus, it is not unusual to find adults a few miles inland from the immediate coast, particularly in pocket meadows within forested areas, grassy swales, and other sheltered areas (Arnold, personal observation). As various introduced species of thistle (*Cirsium* and *Silybum*; Asteraceae) are favored nectar plants, adults may also be observed in disturbed areas where the thistles readily grow.

The silverspot is univoltine. The adult flight season begins in mid- to late June and continues through August, with the height of the flight season typically about mid-July. Males are conspicuous as they fly just above the grass tops incessantly searching for females. This flight behavior is often referred to as a patrolling flight. Closely-related taxa may fly somewhat earlier, are known to live as long as several weeks, so the adults of these subspecies probably have a similar lifespan.

Females lay their eggs on or near the larval food plant. After about one week, the larvae hatch from the egg, eat the eggshell, and then spin a small silken pad which shelters them throughout the remaining summer, fall, and winter months. No other feeding occurs until the following spring, when the larvae feed on the new leaves and flowers of their violet food plant. After feeding for several weeks, they transform into a pupal stage, and the adult butterfly emerges about two weeks later.

Callippe Silverspot Butterfly.

Speyeria callippe callippe is a nymphalid butterfly that occurs in coastal grasslands where its larval food plant, *Viola pedunculata*, grows. Although it was formerly widely distributed throughout the San Francisco Bay area, today the butterfly is known only from San

Bruno Mountain in San Mateo County, Joaquin Miller and Redwood Regional Park areas in Oakland (Arnold 1981). Populations that are somewhat intermediate between the Callippe Silverspot and a related subspecies are known from the Pleasanton and Livermore areas, plus the hills (Lake Herman to I-80) of southwestern Solano County and the American Canyon area in southeastern Napa County (Arnold 1983 and 1985). However, the USFWS generally treats these populations as the endangered butterfly. Even though it has not been observed there in several decades, historical records for the silverspot indicate that it formerly occurred on Twin Peaks in San Francisco. The adult flight season is usually May through mid-July. Adults are particularly fond of various thistles (especially *Cirsium* and *Silybum*), buckeye (*Aesculus*), and mint (*Monardella*) species for nectar. Adults congregate at hill tops to locate their mates. The Callippe's life cycle is similar to that of the Myrtle's Silverspot. It was recognized as endangered by the U.S. Fish & Wildlife Service in 1997.

SURVEY METHODS AND FINDINGS

Field visits occurred on 12 dates from mid-May through mid-July at approximately 5-8 day intervals. Specific survey dates included May 18, 21, 26, and 30, June 2, 5, 9, 11, 18, and 29, plus July 4 and 14, 2003.

Because of the size of the property, I was accompanied by my assistant on all visits. We initially hiked throughout the entire 2,082 acre site to determine the most likely areas to support the butterflies. In the following discussion, I use the parcel names North, Middle, South, and West sections, as presented in the draft Biological Assessment (prepared by The Huffman-Broadway Group, Inc.). The 922-acre Northern Section provides larval habitat because of the presence of *Viola pedunculata* in the hills, foraging habitat for the adults, and mate location habitat due to the hilltops. Of the four parcels, only the Northern Section provides all habitat requirements of both silverspots. The Middle parcel, because of the agricultural activities, supported several stands of thistles along the roadsides and margins of the ag fields, which I initially anticipated might be visited by the silverspots for nectar. Due to the regular plowing of the ground, it is unlikely to support the larval food plant. The Southern and Western Sections did not appear to be suitable to support the larval food plant based on the soils present and generally did not support favored nectar plants of the silverspots. Additional habitat for both species undoubtedly occurs north of the North Section, but we did not survey these off-site lands. Due to the proximity of the larger hills in the Northern Section, mate location is unlikely to occur in the generally flatter Middle, Southern, and Western sections of the site. Based on the findings of my habitat assessment, we allocated our survey effort to observe adult silverspots primarily in the Northern Section and secondarily in the Middle Section, with less time spent in the Western and Southern sections.

Adult silverspots were observed only on the Northern Section during visits between May 21 and July 4, 2003. All silverspot observations were noted in association with the California annual grassland plant community that characterizes most of this section of the property. No silverspots were observed elsewhere on the property. Within the Northern Section, the vast majority of adults were observed in the hilly portion in the northern and eastern portions of this section, with fewer adults observed in the lower hills of the northwestern portion. Only two

adult silverspots were observed in the southwestern portion of the Northern Section, where both were found nectaring on introduced thistles.

A total of 67 adults of *Speyeria zerene sonomensis* were observed. Considerable variation in the adult phentotype was noted, primarily in the ground color and degree of silvering on the underside of the hind wings. Nonetheless, the majority (45 of 67) of the adults observed had the phenotype of *sonomensis*.

A total of 109 adults of *Speyeria callippe* were observed. Like the aforementioned taxon, considerable variation in the adult phenotype was noted, primarily in the degree of black overscaling on the dorsal wings and the ground color of the ventral wings. Phenotypes of 27 adults more closely resembled *Speyeria callippe liliana*, which is better known from locations farther north in Sonoma and Napa counties, while 20 adults resembled *Speyeria callippe comstocki*, which is known from interior locations in the Coast Range. Because 62 of the adult silverspots more closely resembled the phenotype of *Speyeria callippe callippe*, I refer to this population as the endangered Callippe Silverspot.

As mentioned previously, both silverspot taxa were observed only in the Northern Section of the property. While watching adults, it was apparent that many came from lands that lie off-site and north of the Northern Section. No silverspots were observed in the Middle, Southern, or Western sections on the property. Based on these findings, I recommend that the Northern Section be protected to avoid impacts to the endangered Callippe Silverspot.

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If you have any questions regarding my report, please contact me.

Sincerely,

Richard A. Arnold, Ph.D.
President