

**BIOLOGICAL RESOURCES REPORT
PINE MEADOWS GOLF COURSE
MARTINEZ, CONTRA COSTA COUNTY**



June 24, 2011

Prepared for:

Derek Pampe
DeNova Homes, Inc.
1500 Willow Pass Ct.
Concord, CA 94520

Prepared by:



MOSAIC ASSOCIATES LLC
647 TENENT AVE., SUITE 102
PINOLE, CA 94564
PH: (510) 964-0394 FAX: (510) 964-0396

TABLE OF CONTENTS

1. INTRODUCTION	2
1.1 Methods.....	2
1.2 Setting.....	2
2. BIOTIC HABITATS	3
2.1 Mixed Woodland.....	3
2.2 Non-Native Annual Grassland.....	3
2.3 Golf Course and Landscape Vegetation.....	4
2.4 Golf Course Pond and Swales	4
3.0 SPECIAL-STATUS SPECIES AND NATURAL COMMUNITIES	5
3.1 Special-status Plants	5
3.2 Special-status Animals	5
3.3 Special-Status Natural Communities	6
4.0 CONCLUSIONS AND RECOMMENDATIONS	6
5.0 BIBLIOGRAPHY	10

LIST OF FIGURES

Figure 1. Regional Location Map	8
Figure 1. Site Location Map	8
Figure 1. Topographic Map of Site Location.....	9

APPENDICES

Appendix A: List of Rare Plants Occurring within a 9-quad search of the Study Area

Appendix B: Federal and State Listed Animals Occurring within a 9-quad search of the Study Area

Appendix C: List of Plants and Animals Species Observed within the Study Area

Appendix D: Photos of the Study Area

1. INTRODUCTION

This report contains the findings of a reconnaissance-level biological resources evaluation that was conducted for an approximately 26.8-acre golf course located in Martinez, Contra Costa County, California (Figures 1 and 2). The purpose of the biological resources evaluation is to characterize the habitats that are present on site, to provide an inventory of existing biological resources, and make recommendations on the need for further surveys if site disturbance were to occur on site. This report was prepared under contract with DeNova Homes, Inc.

The project site is located at 451 Vine Hill Way, Martinez, CA, east of the intersection of Morello Road and Center Avenue. A nine-hole golf course with club house, tavern, outbuildings and irrigation infrastructure are present on the site. There is a single paved road providing access to the clubhouse and two parking lots, one paved, and one unpaved with gravel. A landscaping yard which contains piles of sand, soil and rock that are associated with golf course maintenance is located south of the clubhouse.

Vegetation within the study area includes mixed planted woodland along the perimeter of the course, patches of non-native annual grassland, and golf course turf on the fairways and tees, interspersed with landscape vegetation. The golf course is irrigated nightly via a system of groundwater wells and City of Martinez water. The water is held in an artificial holding pond, which hosts a perimeter of wetland vegetation. The woodlands and turf, as well as the pond, provide habitat for a number of bird species. Landscape vegetation is present adjacent to the club house, and planted trees and shrubs are scattered throughout the course and fairways.

1.1 Methods

Judy Bendix and Amy Richey of Mosaic Associates performed a reconnaissance level survey of the site on May 31, 2011. The site was surveyed on foot and by golf cart during daylight hours.

Additionally, two surveys of the pond feature were undertaken after sunset on warm, still nights to survey for amphibian life using the methods described in the California red legged frog survey protocol (USFWS 2005). These surveys were conducted on June 14 and June 23, 2011.

Sources of information used in this analysis included a map provided by DeNova Homes, aerial photos from Google Earth, topographic maps from National Geographic, and a personal interview with the landowner and golf course manager (personal communications with Christine Dean). Observations of biological resources were made during the site visits.

1.2 Setting

The project site is located approximately one-half mile south of Highway 4, off Morello Drive. Surrounding land use is single-home residential. An unnamed tributary to Grayson Creek is located off site, approximately 250 feet to the south. Briones Regional Open Space is located approximately two miles southwest of the site.

Pine Meadows Golf Course is situated within surrounding suburban development. Elevations on site range from 310 feet on the hill on the southeast side of the property, to 160 feet in the northwestern edge of the property. Vegetation on site is maintained for a parklike appearance conducive to its current use as a golf course.

This site has been home to a golf course for the last 46 years. Prior to its development as a golf course, this site had been a part of a farm and ranch, where walnuts, almonds, and then grapes were grown.

2. BIOTIC HABITATS

Mature woodland vegetation is present on the borders of the site. Landscape vegetation is present around the buildings and in the golf course greens. A man-made pond feature serves the golf course as a holding area for irrigation water. Plant communities are described in more detail below.

2.1 Mixed Woodland

The site borders are wooded with a mature mixed woodland canopy, consisting of blue and red gum eucalyptus (*Eucalyptus globulus* and *E. camaldulensis*), coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), deodar cedar (*Cedrus deodara*), coast redwood (*Sequoia sempervirens*) and Monterey pine (*Pinus radiata*), among others. Most of the cover in this type is provided by introduced species that were planted at the perimeter of the site. Members of the shrub layer in this area include cotoneaster (*Cotoneaster pannosus*), oleander (*Nerium oleander*), mulberry (*Morus* sp.) and toyon (*Heteromeles arbutifolia*). These borders are not irrigated.

The woodlands provide habitat for a number of bird species, including bushtit (*Psaltriparus minimus*), western scrub jay (*Aphelocoma californica*), black phoebe (*Sayornis nigricans*), and Swainson's thrush (*Catharus ustulatus*), among others. Raccoons (*Procyon lotor*) and domestic cats (*Felis domesticus*) are expected to forage on site.

Woodland on site does not conform to any specific series as classified by Sawyer et al. (2009), but rather is a combination of species which, when one is dominant, would conform to a specific series.

2.2 Non-Native Annual Grassland

Non-native annual grassland consists of a ground layer of annual grasses and herbs, where emergent trees and shrubs may be present. Fall temperatures and precipitation are major factors determining grassland composition, along with microclimatic differences (Sawyer et al. 2009). On the site, these areas are dominated by various non-native grasses, including Italian ryegrass (*Lolium multiflorum*), hare barley (*Hordeum murinum*), and wild oat (*Avena fatua*); and non-native herbaceous species including cut leaf geranium (*Geranium dissectum*), bristly ox-tongue (*Picris echioides*), bedstraw (*Gallium aparine*) and hedgeparsley (*Torilis arvensis*).

Non-native annual grassland is present in small areas of un-irrigated grasslands where mature woodland does not dominate on site. There is a steep hillside on the western

border of the site that does not receive regular maintenance that also hosts this community. Non-native annual grassland on site would conform to the California annual grassland series as classified by Sawyer et al. (2009).

2.3 Golf Course and Landscape Vegetation

Vegetation on the fairways and greens is golf course-maintained turf grasses. These areas are irrigated nightly via a system of groundwater pumping and municipal water. Landscape trees and shrubs have been planted around the buildings, including Monterey pine, incense cedar (*Calocedrus decurrens*), oleander, and gum trees. Typical landscaping, with Kentucky bluegrass (*Poa pratensis*) and lilies-of-the-Nile (*Agapanthus spp.*), and cultivated roses, surrounds the club house and parking lot. The maintenance yard consists of two buildings and two sheds, all surrounded by trees and shrubs, and a large compacted-soil area where several vehicles are parked. The landscape yard is fringed with several large piles of landscaping materials used for the golf course.

2.4 Golf Course Pond and Swales

There is a man-made pond feature in the center portion of the golf course. This feature is unlined, and filled by groundwater well pumping and city water. Two wells are present on the golf course property. Groundwater pumped from the wells to the pond supplies approximately 40% of the water used to irrigate the golf course, with the balance coming from the Martinez Municipal Water District. The golf course manager reports that it takes approximately 12 hours to fill the pond with pumped water. The purpose of this pond is to hold water for nightly irrigation of the fairways and greens on the golf course, and it would not exist if pumping to this feature were discontinued. The golf course maintenance crew clears wetland vegetation from the perimeter of the pond twice yearly to maintain open water for irrigation. The crew was clearing vegetation during the May 31 site visit.

The pond on site is fringed with cattails (*Typha angustifolia*) and bulrushes (*Schoenoplectus actutus*), and patches of umbrella sedge (*Cyperus eragrostis*) and creeping spikerush (*Eleocharis macrostachya*). A vacant red-winged blackbird (*Agelaius phoeniceus*) nest was observed in the cattails; numerous individuals of this species were present during all site visits. A pair of mallards (*Anas platyrhynchos*) nested in the pond in 2011. Mosquito fish (*Gambusia affinis*) are abundant in the pond, as well as aquatic insects, including giant diving beetle (*Dytiscus sp.*). Bats likely forage over the pond and the golf course during the evening hours. Dozens of Pacific treefrogs (*Hyla regilla*) were observed in this pond during the two nighttime surveys.

Despite the presence of wetland vegetation and the unconfirmed but likely presence of hydric soils due to decades of inundated conditions, this feature would probably not be considered to be a jurisdictional wetland by the US Army Corps of Engineers because its hydrology is entirely dependent on pumped groundwater and municipal sources.

Additionally, there are a series of vegetated swales on site that convey water to the municipal storm drain system. These occur along the northern and eastern boundaries of the site. The swale along the northern boundary likely receives runoff from the pond as well as much of the northern portion of the site during rainy periods. A portion of it is

perched against the fences and yards that abut the site. A short section of eroded ditch near the northeast corner of the site drains golf course runoff to the municipal storm drain system. There is a concrete U-ditch that conveys water from the western hillside to the northwestern corner of the site. The grassy swales could potentially meet the three technical parameters of a wetland, as defined in the *Corps of Engineers Wetlands Delineation Manual* (“Corps Manual”) (Environmental Laboratory 1987), but a wetland delineation was not conducted during the present effort.

3.0 SPECIAL-STATUS SPECIES AND NATURAL COMMUNITIES

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

3.1 Special-status Plants

A total of 65 rare plants are listed as occurring within a nine-quadrangle area surrounding the site. Due to continuous site disturbance, first from agriculture and subsequently from golf course maintenance activities; as well as surrounding site disturbance by suburban development, it is extremely unlikely that any special-status plant would occur within or in the vicinity of the study area. No rare plants were detected during the survey conducted for this assessment, and none are expected to occur on site. For a complete list of special-status plants known from the vicinity of the site, please see Appendix A.

3.2 Special-status Animals

Historical and continuing site disturbance makes the presence of special-status animals on site very extremely unlikely. However, nesting birds may utilize the trees and open areas afforded by golf course landscape vegetation. Thirteen federal- or state-listed special-status animals were considered for their potential to occur in the vicinity of the Pine Meadows site (Appendix B). Habitat affinities and reported distributions were analyzed to determine if there is potential for their occurrence within the study site. Twelve species were disqualified from further consideration because suitable habitat is not present for them at the site.

Suitable habitat for one species, the California red-legged frog (*Rana draytonii*, CRLF) is present, but CRLF is extremely unlikely to occur on site, and was not detected during the two evening surveys of the pond and surrounding habitat. Although raccoons (*Procyon*

lotor), known predators of CRLF were not observed during the evening site visits, they are likely to be abundant on site and in the surrounding neighborhood. Continuous maintenance of the site as a golf course, the nightly draining and refilling of the pond as a source of irrigation water, the developed nature of the surrounding suburban landscape, and isolation of the site from source populations in the region, preclude presence of this species. The nearest CRLF occurrence is located 3.45 miles from the site in Briones Regional Park, and the unnamed tributary of Grayson Creek south of the site does not provide suitable habitat for this species. Mosaic biologists surveyed the man-made pond on June 14, and June 23, 2011. We observed many Pacific treefrogs, but no California red-legged frogs of any life stage were observed on site, nor were any other special-status animals were observed on site.

The study site does provide suitable nesting and foraging habitat for a variety of birds, both special-status and non-special-status, but protected under the Migratory Bird Treaty Act (MBTA). The trees on site might provide nesting habitat for special-status birds, including Cooper's hawk (*Accipiter cooperii*) and white-tailed kite (*Elanus leucurus*). Shrubs and small trees on site also provide nesting habitat for a variety of birds protected under the MBTA, including western bluebird (*Sialia Mexicana*), American goldfinch (*Carduelis tristis*), oak titmouse (*Baeolophus inornatus*) and others.

3.3 Special-Status Natural Communities

Special-status natural communities are those that are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (*i.e.*, §404 and 401 of the Clean Water Act, the CDFG §1600 *et seq.* of the California Fish and Game Code, and/or the Porter-Cologne Act). In addition, the California Natural Diversity Data Base (CNDDB) has designated a number of communities as rare; these communities are given the highest inventory priority (Holland 1986, CDFG 2003e). The site does not support any rare natural communities.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Due to the history of agricultural and golf course management on site, the Pine Meadows site is fully disturbed and native habitats have been largely eliminated. Accordingly, biological constraints to development are limited. Suitable nesting habitat for a number of raptors and migratory birds are present on site. Impacts to these birds and their nests can be avoided by conducting site disturbance activities outside the nesting season (February 1 – August 31) or through preconstruction surveys and the observance of no-disturbance buffers surrounding occupied nests if construction activities occur during the nesting season.

The extent to which the man-made pond and the earthen swales would be considered jurisdictional wetlands was not determined during the present effort. If the site is purchased and proposed for development, we recommend that pumping into the irrigation pond be discontinued. This would allow the pond to dry and would allow for an evaluation of its hydrology absent an artificial source. We also recommend that pumping records for this feature be obtained from the present landowner in order to document its

maintained status. A cessation of pumping will also reduce runoff into the swale along the northern boundary of the site.

A wetland delineation and jurisdictional determination by the Army Corps of Engineers of the status of the pond and swales on site will eventually be needed for the environmental analysis conducted pursuant to the California Environmental Quality Act (CEQA). Time permitting, this would be done at least a year after pumping into the pond is halted, but if such a delay is not possible, a thorough documentation of the maintained status of the pond will be needed. If any of these features are determined to be jurisdictional wetlands or “other waters” of the U.S. and if they would be filled during construction, authorization under Sections 404 and 401 of the federal Clean Water Act from the Army Corps of Engineers (Section 404) and the San Francisco Bay Regional Water Quality Control Board (Section 401) would be required.

Finally, no special-status species were observed on site. The potential for rare plants to occur on site is extremely unlikely due to the long period of agricultural and then golf course development. Similarly, habitat is lacking for special-status reptiles and mammals, and while the pond is nominally suitable for CRLF, the isolation of the site from source populations, nightly fluctuations in water level, and managed nature of the site preclude presence of this species from the Pine Meadows project site.

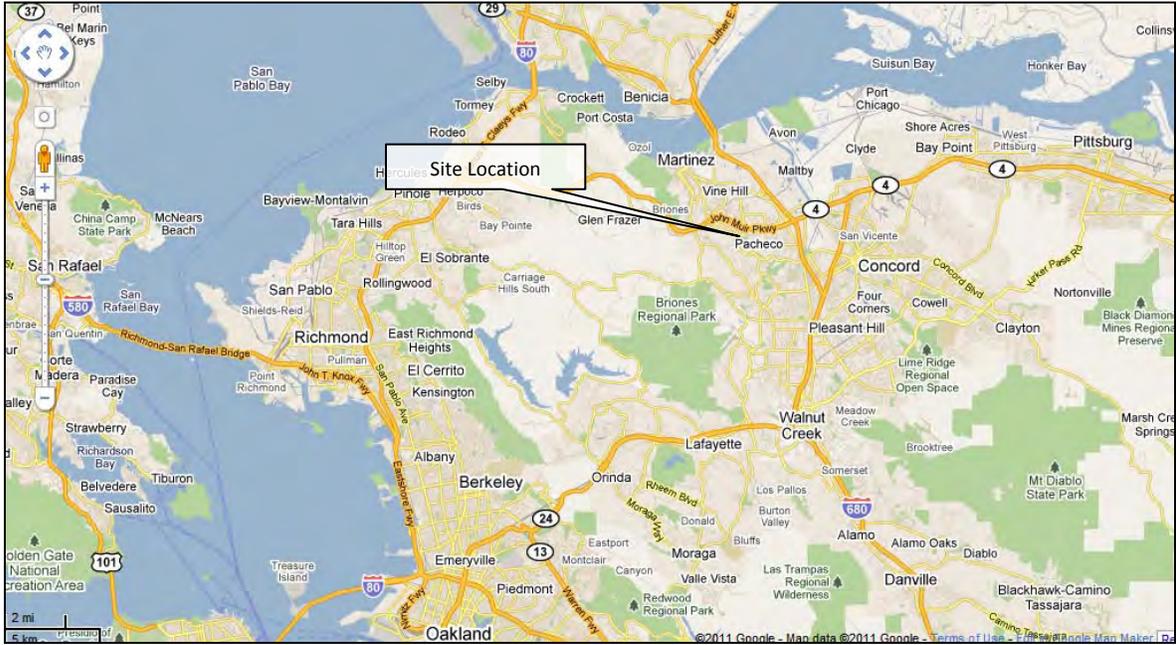


Figure 1. Regional Location Map

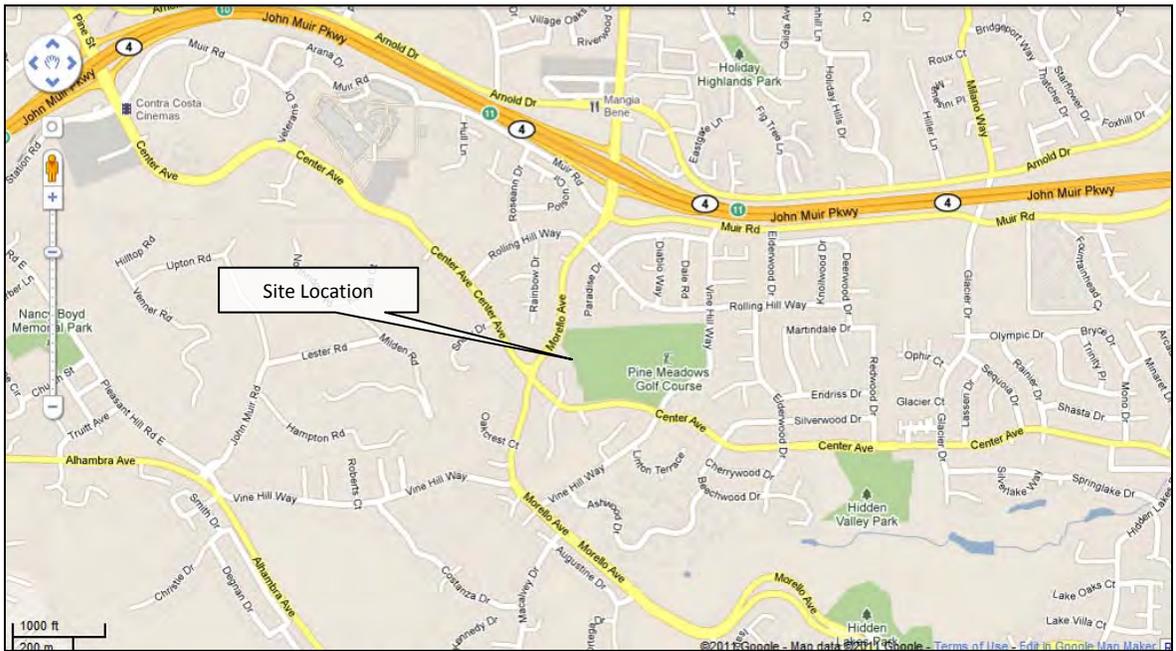


Figure 2. Site Location

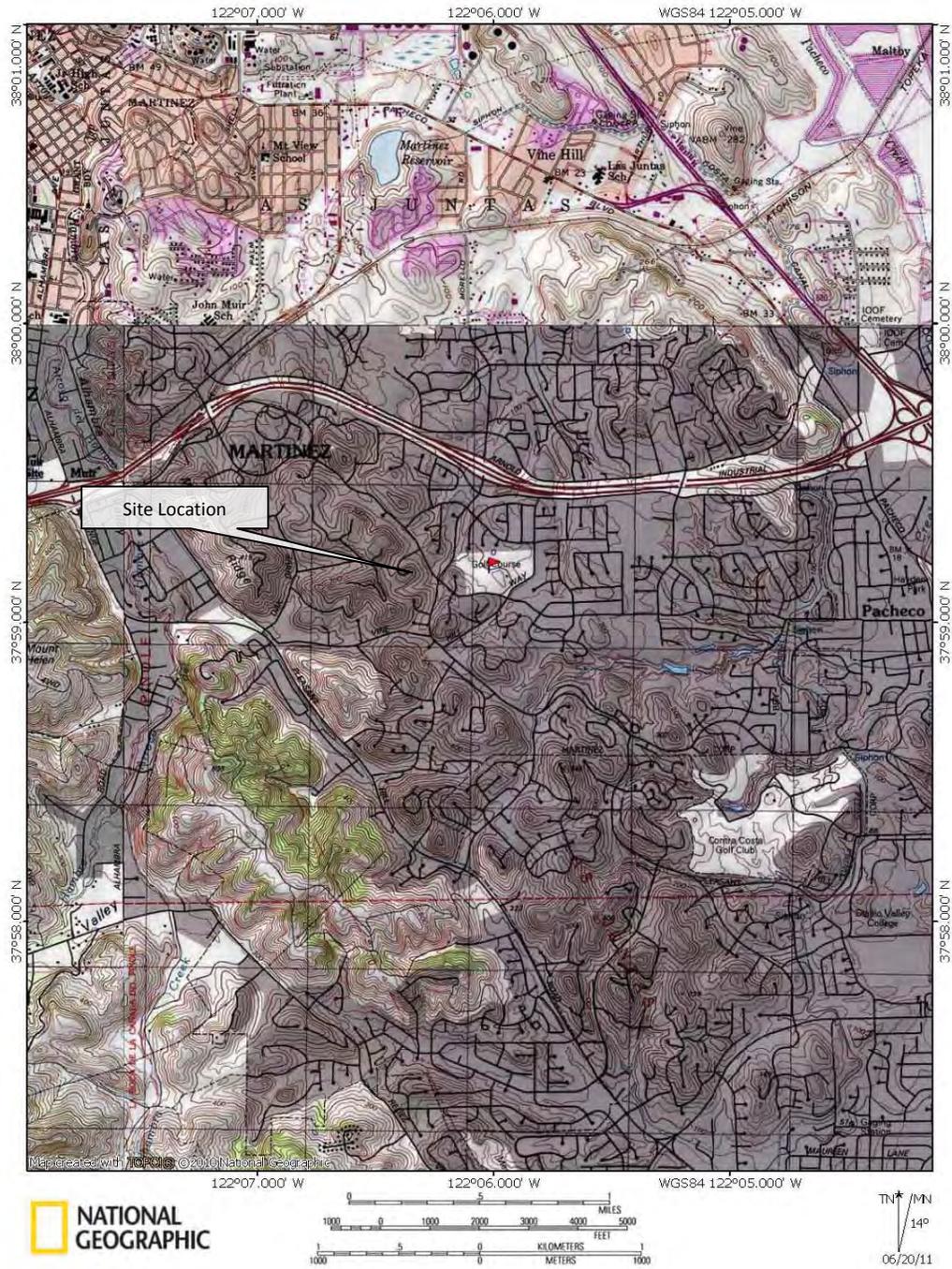


Figure 3. Topographic Map of Site Location

5.0 BIBLIOGRAPHY

- California Department of Fish and Game (CDFG). 2006. Rare Find. Natural Diversity Data Base.
- California Department of Fish and Game (CDFG). 2003a. *Special Vascular Plants, Bryophytes, and Lichens List*. California Natural Diversity Data Base. January.
- California Department of Fish and Game Natural Diversity Database (CNDDDB). 2011. RareFind. Version 3.1.0, copyright 2003. Dated June 04, 2011.
- California Department of Fish and Game (CDFG). 2003b. *State and Federally Listed Endangered, Threatened, and Rare Plants of California*. Habitat Conservation Division, California Natural Diversity Data Base. April.
- California Department of Fish and Game (CDFG). 2003c. *Special Animals*. California Natural Diversity Data Base. January.
- California Department of Fish and Game (CDFG). 2003d. *State and Federally Listed Endangered and Threatened Animals of California*. Habitat Conservation Division, California Natural Diversity Data Base. April.
- California Department of Fish and Game (CDFG). 2003e. *List of Terrestrial Natural Communities recognized by the California Natural Diversity Database*. Natural Diversity Database, Wildlife and Habitat Data Analysis Branch. September.
- California Native Plant Society (CNPS). 2001. *Inventory of Rare and Endangered Plants of California* (sixth edition). Rare Plant Scientific Advisory Committee, David P.; Tibor, Convening Editor. California Native Plant Society. Sacramento, CA. x 388 pp.
- California Native Plant Society (CNPS). 2011. *Inventory of Rare and Endangered Plants* (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Accessed on Wednesday, June 22, 2011.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131 pp.
- Environmental Laboratory, 2006. Interim Supplement to the Corps of Engineers Wetland Delineation Manual Arid West Region. ERDC/EL TR-06-16. U.S. Army Engineer Research and Development Center, Vicksburg, MS. December. 108 pp.
- Environmental Laboratory, 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. January. 100 pp.
- Holland, R. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. California Department of Fish and Game, The Resources Agency. 156 pp.
- Sawyer, J.O., T. Keeler-Wolf and J.M. Evens. 2009. *A Manual of California Vegetation*. California Native Plant Society, Sacramento.
- U.S. Fish and Wildlife Service (USFWS). 2005. Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog. August.

Appendix A. List of Rare Plants Occurring within a 9-quad search of the Study Area. (Quads: Walnut Creek (center), Benicia, Vine Hill, Hondker Bay, Briones Valley, Clayton, Oakland East, Las Trampas Ridge, Diablo) Source: California Native Plant Society (CNPS). 2011. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Accessed on Wednesday, June 22, 2011.

Scientific Name	Common Name	Family	Lifeform	FESA, CESA, CNPS Rare Plant Rank	Elevation Range	Potential to Occur on Site
<i>Viburnum ellipticum</i>	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	None, None, 2.3	215 - 1400	Extremely unlikely
<i>Cicuta maculata</i> var. <i>bolanderi</i>	Bolander's water-hemlock	Apiaceae	perennial herb	None, None, 2.1	0 - 200	Extremely unlikely
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	None, CR, 1B.1	0 - 10	Extremely unlikely
<i>Sanicula maritima</i>	adobe sanicle	Apiaceae	perennial herb	None, CR, 1B.1	30 - 240	Extremely unlikely
<i>Sanicula saxatilis</i>	rock sanicle	Apiaceae	perennial herb	None, CR, 1B.2	620 - 1175	Extremely unlikely
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	big-scale balsamroot	Asteraceae	perennial herb	None, None, 1B.2	90 - 1555	Extremely unlikely
<i>Blepharizonia plumosa</i>	big tarplant	Asteraceae	annual herb	None, None, 1B.1	30 - 505	Extremely unlikely
<i>Centromadia parryi</i> ssp. <i>congdonii</i>	Congdon's tarplant	Asteraceae	annual herb	None, None, 1B.2	0 - 230	Extremely unlikely
<i>Cirsium andrewsii</i>	Franciscan thistle	Asteraceae	perennial herb	None, None, 1B.2	0 - 150	Extremely unlikely
<i>Helianthella castanea</i>	Diablo helianthella	Asteraceae	perennial herb	None, None, 1B.2	60 - 1300	Extremely unlikely
<i>Holocarpha macradenia</i>	Santa Cruz tarplant	Asteraceae	annual herb	FT, CE, 1B.1	10 - 220	Extremely unlikely
<i>Lasthenia conjugens</i>	Contra Costa goldfields	Asteraceae	annual herb	FE, None, 1B.1	0 - 470	Extremely unlikely
<i>Micropus amphibolus</i>	Mt. Diablo cottonweed	Asteraceae	annual herb	None, None, 3.2	45 - 825	Extremely unlikely

Scientific Name	Common Name	Family	Lifeform	FESA, CESA, CNPS Rare Plant Rank	Elevation Range	Potential to Occur on Site
Monolopia gracilens	woodland woolythreads	Asteraceae	annual herb	None, None, 1B.2	100 - 1200	Extremely unlikely
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	None, None, 2.2	15 - 800	Extremely unlikely
Symphotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	None, None, 1B.2	0 - 3	Extremely unlikely
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	None, None, 1B.2	3 - 500	Extremely unlikely
Plagiobothrys diffusus	San Francisco popcorn- flower	Boraginaceae	annual herb	None, CE, 1B.1	60 - 360	Extremely unlikely
Arabis blepharophylla	coast rock cress	Brassicaceae	perennial herb	None, None, 4.3	3 - 1100	Extremely unlikely
Streptanthus albidus ssp. peramoenus	most beautiful jewel- flower	Brassicaceae	annual herb	None, None, 1B.2	94 - 1000	Extremely unlikely
Streptanthus hispidus	Mt. Diablo jewel-flower	Brassicaceae	annual herb	None, None, 1B.3	365 - 1200	Extremely unlikely
Tropidocarpum capparideum	caper-fruited tropidocarpum	Brassicaceae	annual herb	None, None, 1B.1	1 - 455	Extremely unlikely
Anomobryum julaceum	slender silver moss	Bryaceae	moss	None, None, 2.2	100 - 1000	Extremely unlikely
Campanula exigua	chaparral harebell	Campanulaceae	annual herb	None, None, 1B.2	275 - 1250	Extremely unlikely
Atriplex cordulata	heartscale	Chenopodiaceae	annual herb	None, None, 1B.2	0 - 560	Extremely unlikely
Atriplex joaquiniana	San Joaquin spearscale	Chenopodiaceae	annual herb	None, None, 1B.2	1 - 835	Extremely unlikely
Arctostaphylos auriculata	Mt. Diablo manzanita	Ericaceae	perennial evergreen shrub	None, None, 1B.3	135 - 650	Extremely unlikely
Arctostaphylos manzanita ssp. laevigata	Contra Costa manzanita	Ericaceae	perennial evergreen shrub	None, None, 1B.2	500 - 1100	Extremely unlikely
Arctostaphylos pallida	pallid manzanita	Ericaceae	perennial	FT, CE, 1B.1	185 - 465	Extremely

Scientific Name	Common Name	Family	Lifeform	FESA, CESA, CNPS Rare Plant Rank	Elevation Range	Potential to Occur on Site
			evergreen shrub			unlikely
<i>Astragalus tener</i> var. <i>tener</i>	alkali milk-vetch	Fabaceae	annual herb	None, None, 1B.2	1 - 60	Extremely unlikely
<i>Hoita strobilina</i>	Loma Prieta hoita	Fabaceae	perennial herb	None, None, 1B.1	30 - 860	Extremely unlikely
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	Fabaceae	perennial herb	None, None, 1B.2	0 - 4	Extremely unlikely
<i>Trifolium hydrophilum</i>	saline clover	Fabaceae	annual herb	None, None, 1B.2	0 - 300	Extremely unlikely
<i>California macrophylla</i>	round-leaved filaree	Geraniaceae	annual herb	None, None, 1B.1	15 - 1200	Extremely unlikely
<i>Phacelia phacelioides</i>	Mt. Diablo phacelia	Hydrophyllaceae	annual herb	None, None, 1B.2	500 - 1370	Extremely unlikely
<i>Iris longipetala</i>	coast iris	Iridaceae	perennial rhizomatous herb	None, None, 4.2	0 - 600	Extremely unlikely
<i>Juglans hindsii</i>	Northern California black walnut	Juglandaceae	perennial deciduous tree	None, None, 1B.1	0 - 440	Extremely unlikely
<i>Monardella antonina</i> ssp. <i>antonina</i>	San Antonio Hills monardella	Lamiaceae	perennial rhizomatous herb	None, None, 3	500 - 1000	Extremely unlikely
<i>Monardella villosa</i> ssp. <i>globosa</i>	robust monardella	Lamiaceae	perennial rhizomatous herb	None, None, 1B.2	100 - 915	Extremely unlikely
<i>Calochortus pulchellus</i>	Mt. Diablo fairy-lantern	Liliaceae	perennial bulbiferous herb	None, None, 1B.2	30 - 840	Extremely unlikely
<i>Calochortus umbellatus</i>	Oakland star-tulip	Liliaceae	perennial bulbiferous herb	None, None, 4.2	100 - 700	Extremely unlikely
<i>Fritillaria liliacea</i>	fragrant fritillary	Liliaceae	perennial bulbiferous herb	None, None, 1B.2	3 - 410	Extremely unlikely
<i>Hesperolinon breweri</i>	Brewer's western flax	Linaceae	annual herb	None, None, 1B.2	30 - 900	Extremely unlikely
<i>Malacothamnus hallii</i>	Hall's bush-mallow	Malvaceae	perennial evergreen shrub	None, None, 1B.2	10 - 760	Extremely unlikely

Scientific Name	Common Name	Family	Lifeform	FESA, CESA, CNPS Rare Plant Rank	Elevation Range	Potential to Occur on Site
Clarkia concinna ssp. automixa	Santa Clara red ribbons	Onagraceae	annual herb	None, None, 4.3	90 - 1500	Extremely unlikely
Clarkia franciscana	Presidio clarkia	Onagraceae	annual herb	FE, CE, 1B.1	25 - 335	Extremely unlikely
Oenothera deltooides ssp. howellii	Antioch Dunes evening-primrose	Onagraceae	perennial herb	FE, CE, 1B.1	0 - 30	Extremely unlikely
Castilleja rubicundula ssp. rubicundula	pink creamsacs	Orobanchaceae	annual herb	None, None, 1B.2	20 - 910	Extremely unlikely
Chloropyron molle ssp. molle	soft bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	FE, CR, 1B.2	0 - 3	Extremely unlikely
Cordylanthus nidularius	Mt. Diablo bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	None, CR, 1B.1	600 - 800	Extremely unlikely
Meconella oregana	Oregon meconella	Papaveraceae	annual herb	None, None, 1B.1	250 - 620	Extremely unlikely
Eriastrum brandegeae	Brandegee's eriastrum	Polemoniaceae	annual herb	None, None, 1B.2	305 - 1030	Extremely unlikely
Navarretia gowenii	Lime Ridge navarretia	Polemoniaceae	annual herb	None, None, 1B.1	180 - 305	Extremely unlikely
Chorizanthe robusta var. robusta	robust spineflower	Polygonaceae	annual herb	FE, None, 1B.1	3 - 300	Extremely unlikely
Eriogonum luteolum var. caninum	Tiburon buckwheat	Polygonaceae	annual herb	None, None, 1B.2	0 - 700	Extremely unlikely
Eriogonum truncatum	Mt. Diablo buckwheat	Polygonaceae	annual herb	None, None, 1B.1	3 - 350	Extremely unlikely
Calandrinia breweri	Brewer's calandrinia	Portulacaceae	annual herb	None, None, 4.2	10 - 1220	Extremely unlikely
Stuckenia filiformis	slender-leaved pondweed	Potamogetonaceae	perennial rhizomatous herb	None, None, 2.2	300 - 2150	Extremely unlikely
Didymodon norrisii	Norris' beard moss	Pottiaceae	moss	None, None, 2.2	600 - 1973	Extremely unlikely
Triquetrella californica	coastal triquetrella	Pottiaceae	moss	None, None, 1B.2	10 - 100	Extremely

Scientific Name	Common Name	Family	Lifeform	FESA, CESA, CNPS Rare Plant Rank	Elevation Range	Potential to Occur on Site
						unlikely
<i>Androsace elongata</i> ssp. <i>acuta</i>	California androsace	Primulaceae	annual herb	None, None, 4.2	150 - 1200	Extremely unlikely
<i>Delphinium californicum</i> ssp. <i>interius</i>	Hospital Canyon larkspur	Ranunculaceae	perennial herb	None, None, 1B.2	230 - 1095	Extremely unlikely
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	Kellogg's horkelia	Rosaceae	perennial herb	None, None, 1B.1	10 - 200	Extremely unlikely
<i>Limosella subulata</i>	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	None, None, 2.1	0 - 3	Extremely unlikely
<i>Dirca occidentalis</i>	western leatherwood	Thymelaeaceae	perennial deciduous shrub	None, None, 1B.2	50 - 395	Extremely unlikely

Appendix B. Federal and State Listed Animals Occurring within a 9-quad search of the Study Area. (Quads: Walnut Creek (center), Benicia, Vine Hill, Hondker Bay, Briones Valley, Clayton, Oakland East, Las Trampas Ridge, Diablo) Source: CNDDDB 2011.

Scientific Name	Common Name	FESA, CESA, CDFG Rank	General Habitat Requirements and Notes	Specific Habitat Requirements	Potential to Occur on Site
<i>Ambystoma californiense</i>	California tiger salamander	Threatened, Threatened, Special Concern	Central valley DPS federally listed as threatened. Santa Barbara & Sonoma counties DPS federally listed as endangered.	Need underground refuges, especially ground squirrel burrows & vernal pools or other seasonal water sources for breeding	None. Pond is maintained through pumped groundwater and municipal water. Suitable aestivation habitat is lacking. Historic record from 1920 is 1.15 miles from site, but CNDDDB considers CTS population to be extirpated. Absence of suitable habitat, continuous site maintenance and surrounding suburban development; remoteness from source populations preclude presence.
<i>Callophrys mossii bayensis</i>	San Bruno elfin butterfly	Endangered, None, None	Coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno mountain, San Mateo County.	Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is <i>Sedum spathulifolium</i> .	None. Habitat does not occur on site.
<i>Eucyclogobius newberryi</i>	tidewater goby	Endangered, None, Special Concern	Brackish water habitats along the California coast from Agua Hedionda lagoon, San Diego Co. to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water & high oxygen levels.	None. Habitat does not occur on site.
<i>Euphydryas editha bayensis</i>	Bay checkerspot butterfly	Threatened, None, None	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay.	<i>Plantago erecta</i> is the primary host plant; <i>Orthocarpus densiflorus</i> & <i>O. purpurascens</i> are the secondary host plants.	None. Habitat does not occur on site.
<i>Haliaeetus</i>	bald eagle	Delisted,	Ocean shore, lake margins, & rivers	Nests in large, old-growth, or	None. Habitat does not occur on

Scientific Name	Common Name	FESA, CESA, CDFG Rank	General Habitat Requirements and Notes	Specific Habitat Requirements	Potential to Occur on Site
<i>leucocephalus</i>		Endangered, None	for both nesting & wintering. Most nests within 1 mi of water.	dominant live tree w/open branches, especially Ponderosa pine. Roosts communally in winter.	site.
<i>Laterallus jamaicensis coturniculus</i>	California black rail	None, Treated, None	Inhabits freshwater marshes, wet meadows & shallow margins of saltwater marshes bordering larger bays.	Needs water depths of about 1 inch that does not fluctuate during the year & dense vegetation for nesting habitat.	None. Habitat does not occur on site.
<i>Lepidurus packardi</i>	vernal pool tadpole shrimp	Endangered, None, None	Inhabits vernal pools and swales in the Sacramento valley containing clear to highly turbid water.	Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed & highly turbid.	None. Habitat does not occur on site.
<i>Masticophis lateralis euryxanthus</i>	Alameda whipsnake	Threatened, Threatened, None	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats.	Mostly south-facing slopes & ravines, with rock outcrops, deep crevices or abundant rodent burrows.	None. Continuous site disturbance and surrounding suburban development; isolation of site from movement corridors and absence of primary constituent elements such as rock outcrops, chaparral habitat preclude presence.
<i>Rallus longirostris obsoletus</i>	California clapper rail	Endangered, Endangered, None	Salt-water & brackish marshes traversed by tidal sloughs in the vicinity of san francisco bay.	Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	None. Habitat does not occur on site.
<i>Rana draytonii</i>	California red-legged frog	Threatened, None, Special Concern	Lowlands & foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation.	Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Extremely unlikely. Continuous site disturbance and surrounding suburban development; remoteness from source populations preclude presence.

Scientific Name	Common Name	FESA, CESA, CDFG Rank	General Habitat Requirements and Notes	Specific Habitat Requirements	Potential to Occur on Site
<i>Reithrodontomys raviventris</i>	salt-marsh harvest mouse	Endangered, Endangered, None	Only in the saline emergent wetlands of San Francisco Bay and its tributaries.	Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for flood escape.	None. Habitat does not occur on site.
<i>Sternula antillarum browni</i>	California least tern	Endangered, Endangered, None	Nests along the coast from San Francisco Bay south to northern Baja California.	Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas.	None. Habitat does not occur on site.
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	Endangered, Threatened, None	Annual grasslands or grassy open stages with scattered shrubby vegetation.	Need loose-textured sandy soils for burrowing, and suitable prey base.	None. Habitat does not occur on site.

Appendix C. Plants and Animals Observed at the Pine Meadows Golf Course

The following were observed during site visits on May 26, June 14, and June 23.

Plants Observed

Scientific Name	Common Name	Family
Grassland area plants		
<i>Torilis arvensis</i>	hedgearsley	Apiaceae
<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae
<i>Hypochaeris glabra</i>	smooth cat's ear	Asteraceae
<i>Picris echioides</i>	bristly ox-tongue	Asteraceae
<i>Sonchus asper</i>	prickly sowthistle	Asteraceae
<i>Tarxicum officianale</i>	dandelion	Asteraceae
<i>Brassica nigra</i>	black mustard	Brassicaceae
<i>Capsella bursa-pastoris</i>	Shepherd's purse	Brassicaceae
<i>Hirschfeldia incana</i>	field mustard	Brassicaceae
<i>Raphanus sativus</i>	common raddish	Brassicaceae
<i>Convolvulus arvensis</i>	field bindweed	Convolvulaceae
<i>Euphorbia peplus</i>	petty spurge	Euphorbiaceae
<i>Medicago polymorpha</i>	burr clover	Fabaceae
<i>Erodium moschatum</i>	red-stem filaree	Geraniaceae
<i>Geranium dissectum</i>	cutleaf geranium	Geraniaceae
<i>Malva neglecta</i>	common mallow	Malvaceae
<i>Plantago lanceolatum</i>	common plantain	Plantaginaceae
<i>Avena fatua</i>	wild oat	Poaceae
<i>Bromus carinatus</i>	California brome	Poaceae
<i>Bromus hordeaceus</i>	soft chess	Poaceae
<i>Hordeum murinum</i>	hare barley	Poaceae
<i>Lolium multiflorum</i>	Italian ryegrass	Poaceae
<i>Vulpia myuros</i>	rat-tail fescue	Poaceae
<i>Polygonum arenastrum</i>	common knotweed	Polygonaceae
<i>Anagalis arvensis</i>	scarlet pimpernel	Primulaceae
<i>Gallium aparine</i>	bedstraw	Rubiaceae
Swales/pond/wet areas		
<i>Sisymbrium officianale</i>	hedge mustard	Brassicaceae
<i>Cyperus eragrostis</i>	umbrella sedge	Cyperaceae
<i>Eleocharis macrostachya</i>	creeping spikerush	Cyperaceae
<i>Schoenoplectus californicus</i>	southern bulrush	Cyperaceae
<i>Juncus bufonius</i>	toad rush	Juncaceae
<i>Rumex crispus</i>	curly dock	Polygonaceae
<i>Rumex pulcher</i>	fiddle dock	Polygonaceae
<i>Typha angustifolia</i>	narrow leaf cattail	Typhaceae

Woodland/Perimeter and Golf Course Trees		
<i>Acer macrophyllum</i>	bigleaf maple	Aceraceae
<i>Schinus molle</i>	Peruvian peppertree	Anacardiaceae
<i>Nerium oleander</i>	Oleander	Apocynaceae
<i>Hedera helix</i>	English ivy	Araliaceae
<i>Encelia californica</i>	bush sunflower	Asteraceae
<i>Calocedrus decurrens</i>	incense cedar	Cupressaceae
<i>Cedrus deodara</i>	deodar cedar	Cupressaceae
<i>Quercus agrifolia</i>	coast live oak	Fagaceae
<i>Quercus kelloggii</i>	black oak	Fagaceae
<i>Quercus lobata</i>	valley oak	Fagaceae
<i>Juglans hindsii</i>	black walnut	Juglandaceae
<i>Eucalyptus camaldulensis</i>	red gum	Myrtaceae
<i>Eucalyptus globulus</i>	blue gum	Myrtaceae
<i>Fraxinus spp</i>	ash	Oleaceae
<i>Pinus radiata</i>	Monterey pine	Pinaceae
<i>Cotoneaster sp.</i>	cotoneaster	Rosaceae
<i>Heteromeles arbutifolia</i>	toyon	Rosaceae
<i>Prunus dulcis</i>	sweet almond	Rosaceae
<i>Sequoia sempervirens</i>	coast redwood	Taxodiaceae
<i>Albizia julibrissin</i>	Silk tassel	Fabaceae
<i>Morus sp.</i>	mulberry	Moraceae

Animals observed:

Birds

Red-winged blackbird (*Agelaius phoeniceus*)
 American robin (*Turdus migratorius*)
 Western bluebird (*Sialia mexicana*)
 Oak titmouse (*Baeolophus inornatus*)
 Lesser goldfinch (*Carduelis psaltria*)
 Mallard (*Anas platyrhynchos*)
 Northern mockingbird (*Mimus polyglottos*)
 Mourning dove (*Zenaida macroura*)
 Bushtit (*Psaltriparus minimus*)
 House sparrow (*Passer domesticus*)
 Anna's hummingbird (*Calypte anna*)
 California towhee (*Pipilo crissalis*)
 Black phoebe (*Sayornis nigricans*)

Amphibians

Pacific treefrog (*Hyla regilla*)

Fish

Mosquitofish (*Gambusia affinis*)

Appendix D. Pine Meadows Site Photos



Upper photo: Pacific treefrog in the man-made pond, July 14, 2011. Lower photo: maintenance yard near entry to the site.



Upper photo: a portion of the maintenance yard. Lower photo: row of eucalyptus trees lining the southeast border of the site.



Culvert near northeast corner of site is visible behind the fence. A short swale, visible in the center of the photo conveys runoff from the golf course into the municipal storm drain system.



Clubhouse is at the top of the slope, with manicured fairways below, and ornamental trees across the site.



An incised swale at the northern boundary drains to an inlet and culvert on the neighboring property. This swale conveys runoff from the northern portion of the golf course and also from the pond if it overtops.



View of man-made irrigation pond near the center of the site. Golf course maintenance workers were clearing cattails from the perimeter during the May 31st site visit in order to maintain capacity for storing irrigation water.



The concrete ditch near the western border of the sites terminates in a drainage inlet to the municipal storm drain system.



Looking north from higher ground. The golf course pond is visible to the left of the center of the photo.