

**BIOLOGICAL ASSESSMENT
OF NORTH VINEYARD GREENS
DEVELOPMENT PROJECT**
(CORPS REGULATORY #200600428)



Prepared for:

**UNITED STATES ARMY CORPS OF ENGINEERS
and
UNITED STATES FISH AND WILDLIFE SERVICE**

On behalf of:

NORTH VINEYARD GREENS – PETER DARU

February 2008

Mission Statement

*To provide quality environmental consulting
services with integrity that protect and
enhance the human and natural environment*

Biological Assessment of North Vineyard Greens Development Project

(CORPS REGULATORY #200600428)

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SECTION I. INTRODUCTION

PROJECT PURPOSE AND SCOPE

Project objectives are expressed in terms of basic and overall purpose. The basic project purpose is to provide housing in southern Sacramento County. The overall project purpose is to create a small, low density single-family subdivision as well as a high-density component, beginning in 2008, that is proximate to local and regional job centers and existing infrastructure in a manner that is consistent with Sacramento County's urban growth policies requiring compact urban form. The project is not dependent on water.

The NVG project would provide additional housing needed to accommodate job growth and housing demand within Sacramento County projected by the Sacramento Area Council of Governments (SACOG)¹. Sacramento County continues to experience a dramatic population increase, with growth rates in the unincorporated areas of the County averaging 27.7% between 1970 and 1990. (Sacramento County General Plan², Housing Element page 130-31; the Vineyard Community Planning Area, which contains Mequity, LLC's proposed NVG community, experienced a 116% growth rate between 1990 and 2000³.)

SACOG projects that the Sacramento area will need to house more than 1 million additional people in the next 25 years. This population growth continues to put tremendous pressure on the housing market, and SACOG projects that current conditions would yield a shortfall of over 500,000 dwelling units for the Sacramento region by 2050. Rising housing demand, coupled with a shortage of approved residential development sites near established urban areas and regional job centers, have led to a rapid escalation in home prices over the long term. Also, homebuilders must look further from urban areas and job centers to find available homesites and developable land. Mequity, LLC conceived the proposed NVG community to provide new housing to accommodate some of the high demand for housing in the Sacramento region resulting from sustained population growth. NVG is located in an underdeveloped rural residential portion of South/Central Sacramento County that is proximate to established commercial/industrial uses and convenient to major regional job centers in downtown Sacramento, Rancho Cordova, and along the U.S. Highway 50 corridor. It is also proximate to existing infrastructure.

¹ Sacramento Area Council of Governments Employment and Housing Demand projections.

www.sacog.org/demographics/projections/index.cfm

² Planning and Community Development Department, County of Sacramento.

www.saccounty.net/planning/gpupdate/gpu-index.html

³ Sacramento Area Council of Government Population projections.

www.sacog.org/demographics/projections/index.cfm

PROJECT LOCATION

The ±206.3-acre project site is located near the City of Elk Grove, north of Gerber Road, west of Bradshaw Road, south of Florin Road, and east of Elk Grove Florin Road (Figure 1, General Location Map and Aerial Photograph with Development Site). The site corresponds to a portion of Section 6 of Township 7 North, Range 6 East of the Elk Grove, California 7.5-minute quadrangle (U.S. Department of the Interior, Geological Survey, photorevised 1979) and to Assessor's Parcel Numbers 066-0070-020, 043-046; 066-0080-001-003, 016; 065-080-027, 029, 057, 064, 070, and 080.

The approximate geographic coordinates of the site are 38.48° North latitude and 121.35° West longitude (38° 29'N and 121° 21'W). The site is at an elevation of approximately 50 feet (15 meters) above mean sea level. The project is part of the North Vineyard Station Specific Plan and is located within the County's Urban Services Boundary (USB) and the South Sacramento Habitat Conservation Plan (SSHCP) area.

BACKGROUND

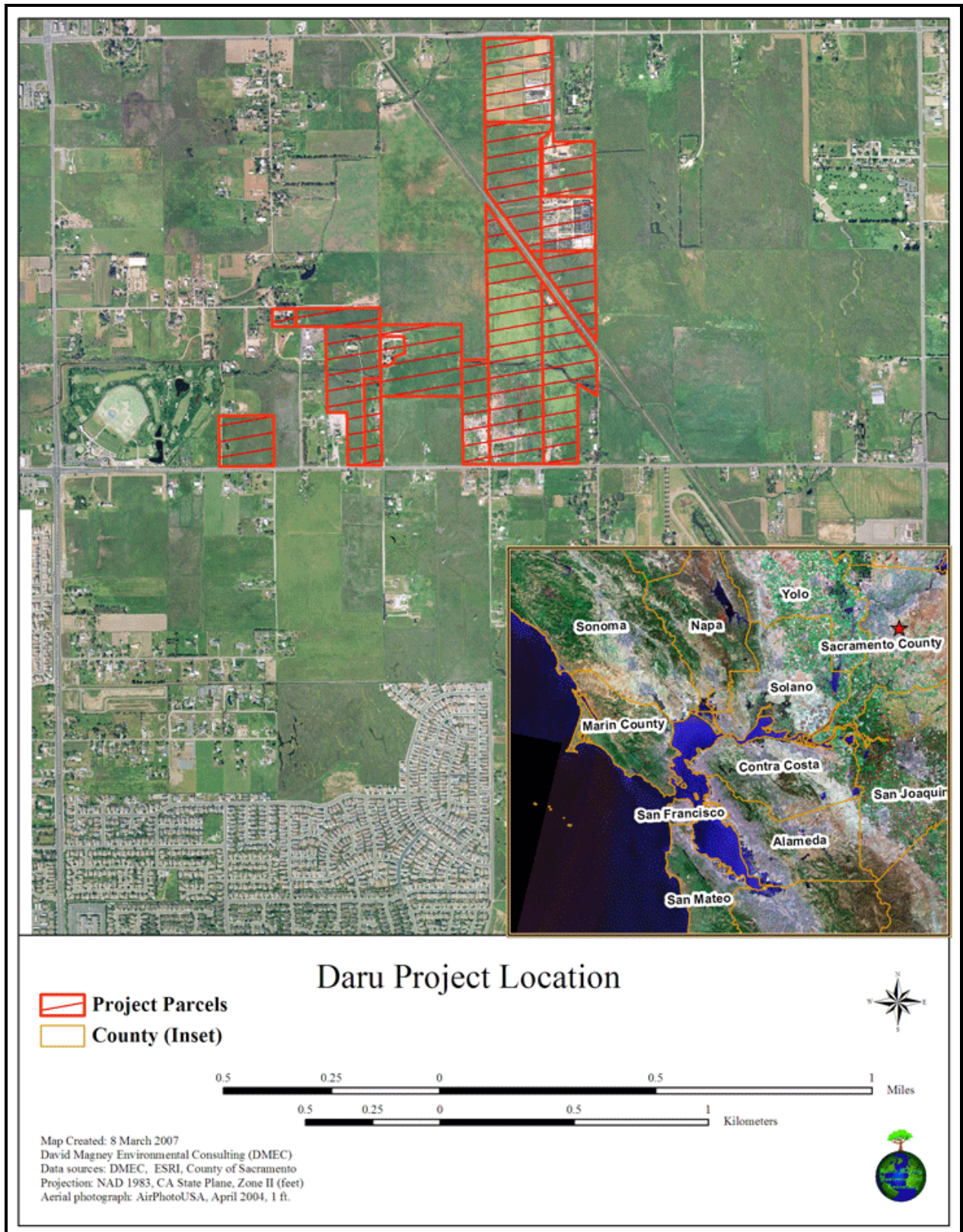
This report is intended to meet the requirements of Federal agencies that need to determine the level of impact a proposed project may have on federally listed or candidate species of plants or wildlife, pursuant to the Code of Federal Regulations (CFR) for the Endangered Species Act (ESA) of 1973, 50CFR402.12. This section of the ESA requires a federal permitting agency to consult with the listing agency(ies) for all listed and candidate species that may be affected by the issuance of the federal permit.

The ±206.3-acre North Vineyard Greens (NVG) project site is part of the ±1,594.5-acre North Vineyard Station Specific Plan (NVSSP) area in southern Sacramento County. The Project consists of NVG Unit 1 (±146.7 acres), NVG Unit 3 (±49.4 acres), and Gosal Estates (±10.2 acres) as shown on Figure 2, North Vineyard Greens Project Units. It is expected that approximately 750 dwelling units will be built on approximately 139 gross residential acres within the NVG project site. Single-family housing will account for about 525 dwelling units and multiple-family housing will account for about 225 units (County of Sacramento 2005).

The Specific Plan was prepared according to direction in the Sacramento County General Plan⁴ and involved public input, extensive analyses of environmental conditions, adjacent land use, and area-wide infrastructure needs. It places a high priority on aesthetics, quality of life, and land use compatibility. The Specific Plan area is bounded by Florin Road to the north, Gerber Road and/or Gerber Creek on the south, the northerly extension of Vineyard Road on the east, and generally by Elder Creek on the west side. The Specific Plan consists of a 5,732-dwelling-unit residential land use plan with supporting commercial, business professional, park, school, and open space uses.

⁴ County of Sacramento, Planning and Community Development Department.
www.saccounty.net/planning/gpupdate/gpu-index.html

Figure 1. General Location Map and Aerial Photograph with Development Site



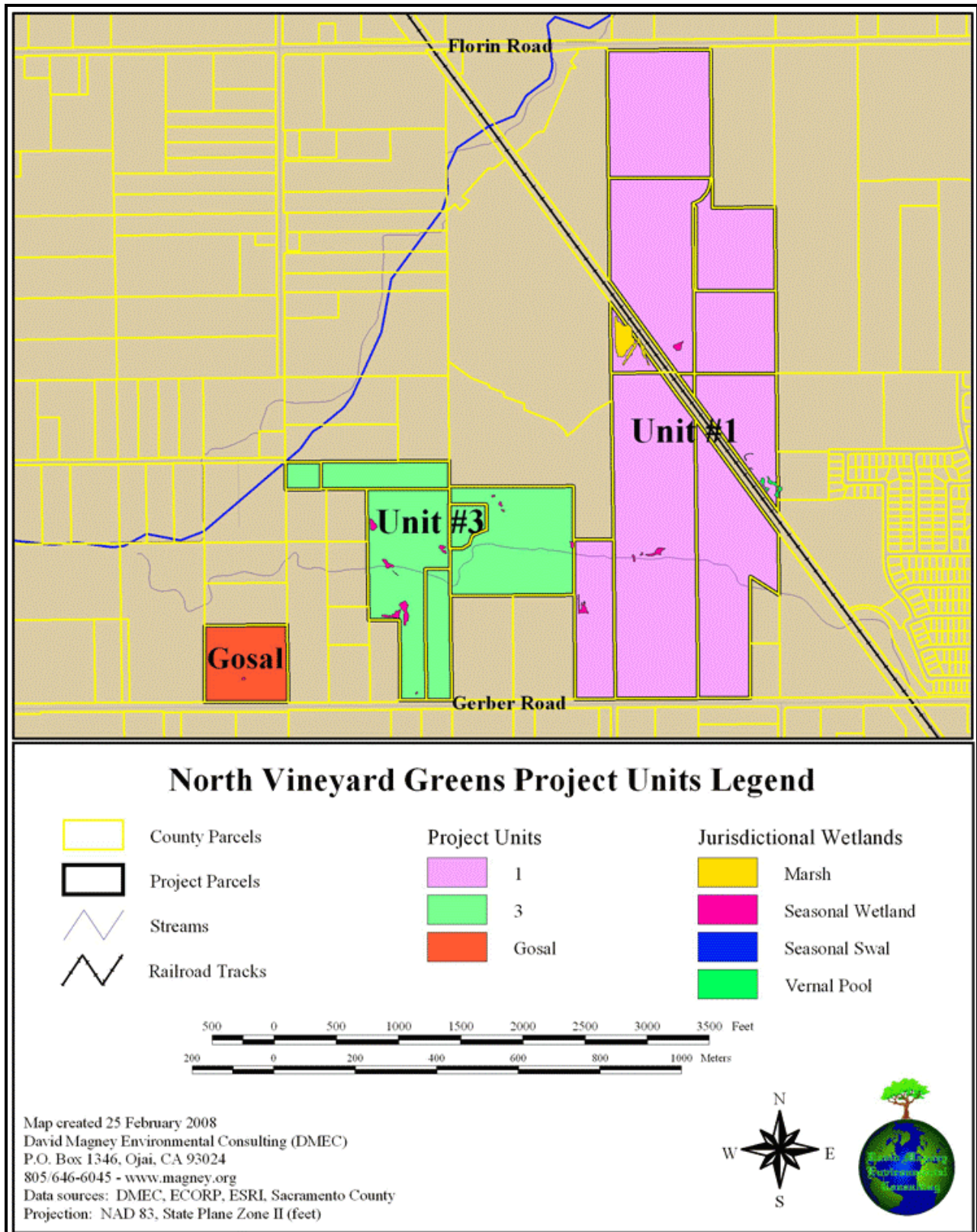
The proposed project responds to the need for a well-planned, high quality suburban environment in the North Vineyard Station area. The NVSSP area is located within the County's Urban Services Boundary (USB) and the South Sacramento Habitat Conservation Plan (SSHCP) area. The North Vineyard Station Specific Plan Environmental Impact Report (EIR) (County of Sacramento 1998) was prepared to identify potential environmental impacts from the development of the North Vineyard Station Area.

The NVSSP includes a regional flood control plan for Gerber and Elder Creeks. The North Vineyard Station Drainage Master Plan (NVSDMP) identifies existing drainage facilities and flooding patterns and analyzes alternatives to recommend preferred flood control and conveyance facilities to serve the drainage needs of the Plan area. The County of Sacramento has submitted an Individual Permit application (not a part of the NVG project) to the U.S. Army Corps of Engineers (Corps), pursuant to Section 404 of the Clean Water Act, for the NVSDMP project that includes the improvements to Gerber Creek and construction of the detention basin within the project area.

ECORP prepared an Individual Permit application for the NVG project, which was submitted to the Corps. David Magney Environmental Consulting (DMEC) was contracted by Peter Daru, project developer, to prepare the Alternatives Analysis for the NVG project site (DMEC 2007a) required by Section 404(b)(1) of the Clean Water Act for 404 individual permit applications⁵. The alternatives analysis identified the filling of 1.60 acres of jurisdictional wetlands with onsite mitigation through the creation of wetland preserve as the least environmentally damaging practicable alternative. DMEC was also contracted to prepare the Wetland Mitigation and Monitoring Plan (DMEC 2007b) in support of the permit application to the Corps, which describes the proposed approach to the required onsite wetland mitigation and monitoring. The U.S. Fish and Wildlife Service previously issued Biological Opinions on Units 1 and 3 of the NVG project in 2004, and these are attached as Appendix A.

⁵ Section 404(b)(1) Guidelines. www.usace.army.mil/cw/cecwo/reg/40cfr230.pdf

Figure 2. North Vineyard Greens Project Units



SECTION II. METHODS

This section describes the methods used to prepare this Biological Assessment.

LITERATURE SURVEY

DMEC surveyed literature pertinent to this biological assessment that included planning, environmental assessment (CEQA), and biological resources of the Sacramento region and the project site and North Vineyard Station Specific Plan (NVSSP) area. The literature survey included searches of databases for biological resources, including the California Natural Diversity Database (CNDDB 2006, 2007, and 2008) and California Native Plant Society (2001, 2008). A list of all literature cited are included in Section VIII, Citations.

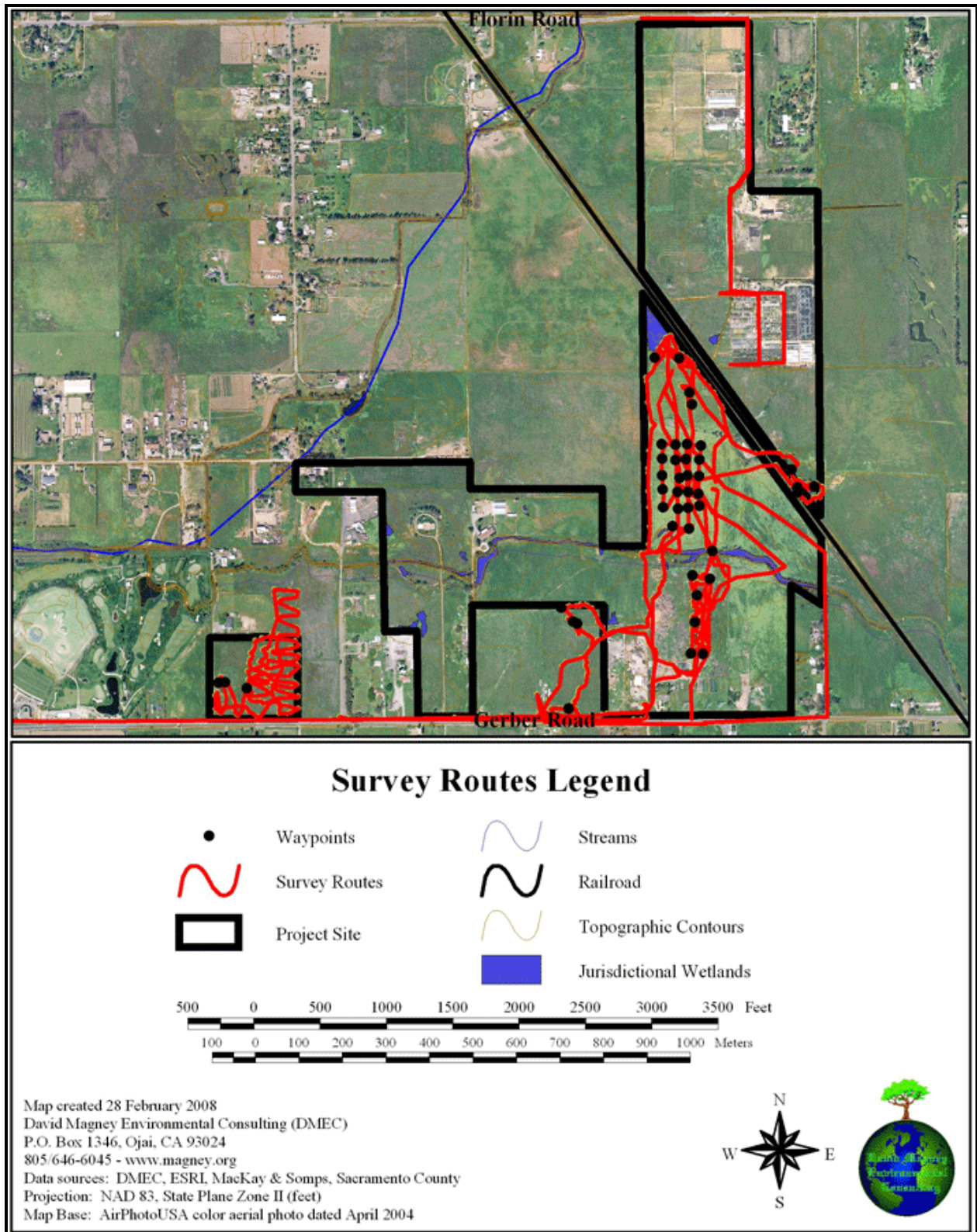
FIELD SURVEY METHODS

Field surveys of the project site and NVSSP area were conducted as part of the NVSSP EIR (County of Sacramento 1998). Additional field surveys of the NVG project site were conducted by ECORP (2008) and DMEC. ECORP (2008) recently completed USFWS protocol-level aquatic invertebrate surveys in 2007 for two wetlands (nonjurisdictional) onsite associated with an abandoned man-made fish pond in the southern portion of Unit 1 of the NVG site.

David Magney of DMEC conducted cursory and specific field surveys of the project site wetlands, proposed mitigation site uplands, and surrounding areas of the NVG project site. Mr. Magney surveyed portions of Units 1 and 3 on 1 August and 21 September 2006; 15 March and 11 May 2007; and the Gosal Estates parcel on 19 February 2008 to assess habitat conditions for special-status species. All species of wildlife and plants observed were recorded in field notes.

A hand-held GPS unit used to track survey routes and obtain geographic coordinates at specific points during each field survey. Figure 3, Project Site Survey Routes, illustrates the portions of the project site surveyed in the field by DMEC. Since the project-related impacts to Gerber Creek wetlands is being permitted separately by the County of Sacramento, no attempt was made to survey or assess these habitats onsite. Focus was given to onsite wetlands.

Figure 3. Project Site Survey Routes



MAPPING METHODS

Vegetation, project components, etc., were mapped using ESRI GIS software (ArcView 3.3 and/or ArcMap 9.1). Waypoints and survey routes were mapped by converting GPS tracks and waypoints to GIS shapefiles using Minnesota Department of Natural Resources ArcView 3.x extension software (DNRGarmin 5.02.0033).

All maps were made in California State Plane projection, Zone II, NAD83, feet. California Natural Diversity Database (2008) GIS data were used and reprojected from native projection. CAD drawing data, such as topographic contours from the project engineer, MacKay & Soms, were converted from a CAD drawing file to a GIS shapefile.

Vegetation and land cover was classified and mapped by aerial photo interpretation and onsite field observations, using the California Native Plant Society (CNPS) classification system and protocols (Sawyer and Keeler-Wolf 1995). Special-status species habitat mapping was conducted by identifying suitable habitat types onsite and coding the vegetation map accordingly. Jurisdictional wetlands were mapped by ECORP, which provided DMEC with a GIS shapefile.

ASSESSMENT METHODS

DMEC assessment project site conditions and potential and known impacts to biological resources by overlaying project components onto areas containing extant habitat. If the habitat is known or expected to support a special-status species or sensitive habitat, the impact was determined and acreage calculated.

Impacts to jurisdictional wetlands and habitats suitable or known to support special-status species were assessed previously by the County of Sacramento (1998) during the EIR review process, and general and specific mitigation measures identified at that time, for the entire NVSSP area. Impacts to onsite wetlands were considered significant as part of the Corps permit process, and DMEC has proposed replacing all impacted wetlands onsite through creation of similar or higher quality wetland habitats, described later in this assessment, and in detail in project wetland mitigation plan (DMEC 2007).

SECTION III. EXISTING CONDITIONS

This section describes the conditions currently existing onsite, including geology and soils, and botanical and wildlife resources, including special-status biological resources. DMEC has characterized existing conditions based on DMEC surveys and results of surveys by others. In addition to the resources observed by DMEC, the following existing conditions are supported by findings reported by the South Sacramento Habitat Conservation Plan (SSHCP) and ECORP Consulting, Inc. (ECORP 2004, 2006).

SITE CHARACTERISTICS

Much of the site is leveled pasture and/or cropland and is currently fallow but was farmed and irrigated historically. Rural residences and plant nursery operations are located in the northern and southern portions of the site. At least one nursery is currently active and several drainage ditches are located west of the northern nursery. The Central California Traction Railroad easement runs diagonally through NVG Unit 1, dividing it into two unequal portions.

The primary vegetation community present onsite is annual grassland. Within the annual grassland are ephemeral wetland features that include seasonal wetlands and vernal pools. Gerber Creek meanders through the southern and central portions of NVG Units 1 and 3. A non-jurisdictional man-made fish pond is situated in the southern portion of NVG Unit 1 south of Gerber Creek. The site is at an elevation of approximately 50 feet (15 meters) above mean sea level.

GEOLOGIC SETTING AND SOILS

The NVG project site is located within the Lower Unit Riverbank Formation. This formation is characterized by a broad floodplain, very deep alluvial soils, lack of constraint to lateral channel migration, and frequent flooding. The Formation is made up of higher riverbank terraces and remnants of alluvial fans composed of alluviums containing claypans and duripans, soils that are capable of supporting seasonal wetlands, swales, and vernal pools (SSHCP).

According to the Soil Survey of Sacramento County, California (USDA 1993), three soil units, or types, have been mapped for the site (ECORP 2006), including: (213 [mapping unit designation]) San Joaquin silt loam, leveled, 0-1 percent slopes, (214) San Joaquin silt loam, 0-3% slopes and (216) San Joaquin-Durixeralfs complex, 0-1 percent slopes. The San Joaquin silt loam, 0-1% slopes is not listed as a hydric soil and does not contain listed hydric inclusions. The San Joaquin-Durixeralfs complex and San Joaquin silt loam, 0-3 % slopes are not considered to be hydric soils; however; they do contain listed hydric inclusions. This is summarized in Table 1, Soil Units Present at the NVG Site.

Table 1. Soil Units Present at the NVG Site

NVG Unit	Soil Units Present	Hydric Soil	Hydric Inclusions or Components
#1	(213) San Joaquin silt loam, leveled, 0-1% slopes	No	Not present
	(216) San Joaquin-Durixeralfs complex, 0-1% slopes	No	Present
#3	(213) San Joaquin silt loam, leveled, 0-1% slopes	No	Not present
	(214) San Joaquin silt loam, 0-3% slopes	No	Present
#11	(213) San Joaquin silt loam, leveled, 0-1% slopes	No	Not present
Gosal	(213) San Joaquin silt loam, leveled, 0-1% slopes	No	Not present

FLORA

The vascular plant species observed by DMEC and reported by ECORP during the NVG wetland delineations (ECORP 2004) and Section 404 Individual Permit Application (ECORP 2006) are listed in Table 2, Plant Species of the NVG Project Site. Table 2, which is alphabetized by scientific (botanical) name, includes the common name, growth habit, wetland indicator status, and botanical family name for each taxon reported onsite.

A total of one hundred fifty-seven (157) vascular plants have been observed and reported for the NVG project site. Of the 157 plant species (includes subspecies and varieties in the calculation) onsite, sixty-three (63) species are native and ninety-four (94) are introduced species. The ratio of native to nonnative taxa for the project site (40% native to 60% non-native) is not representative of the ratio for the entire California flora (Hickman 1993) and other smaller regions within California (approximately 75% native to 25% nonnative). This is indicative of a site that has been substantially and highly disturbed by human activities. Seventy-four (74) of the 157 taxa (47%) are considered hydrophytes, and are assigned a wetland indicator status of least FAC (including 24 FAC, 21 FACW, and 29 OBL species).

Table 3, Plant Species of the Gosal Estates Parcel, provides plant occurrence information specifically for the Gosal Estates portion of the project. A total of thirty (30) vascular plant species have been reported on this parcel by ECORP and DMEC. Of the 30 species, six (6) are native and twenty-four (24) are introduced species, or 20% native and 80% nonnative. Seven (7) of the 30 taxa (23%) are considered hydrophytes, and are assigned a wetland indicator status of at least FAC (including 3 FAC, 3 FACW, and 1 OBL species). These findings indicate that the Gosal Estates parcel is highly disturbed nonnative grassland/fallow agricultural land that supports relatively few species indicative of wetlands. The one small seasonal wetland onsite is dominated by *Lolium multiflorum* and *Rumex crispus*, both naturalized, nonnative species.

Table 2. Plant Species of the NVG Project Site

Scientific Name ⁶	Common Name	Habit ⁷	WIS ⁸	Family
<i>Acer negundo</i>	Box Elder	T	FACW	Sapindaceae
<i>Aegilops triuncialis</i> *	Barbed Goatgrass	AG	-	Poaceae
<i>Ailanthus altissima</i> *	Tree-of-heaven	T	FACU	Hippocastinaceae
<i>Aira caryophylla</i> *	Silver Hairgrass	AG	-	Poaceae
<i>Alisma lanceolatum</i> *	Lanceleaf Water Plantain	PH	OBL	Alismataceae
<i>Alnus rhombifolia</i>	White Alder	T	FACW	Betulaceae
<i>Amaranthus retroflexus</i>	Redroot Amaranth	AH	FACU	Amaranthaceae
<i>Amsinckia menziesii</i>	Rancher's Fire	AH	-	Boraginaceae
<i>Anagallis arvensis</i> *	Scarlet Pimpernel	AH	FAC	Primulaceae
<i>Anthemis cotula</i> *	Mayweed	AH	FACU	Asteraceae
<i>Arundo donax</i> *	Giant Reed	PG	FACW	Poaceae
<i>Asclepias fascicularis</i>	Narrowleaf Milkweed	PH	FAC	Apocynaceae
<i>Asparagus officinalis</i> *	Garden Asparagus	PG	FACU	Asparagaceae
<i>Avena barbata</i> *	Slender Wild Oat	A/PG	-	Poaceae
<i>Avena fatua</i> *	Wild Oat	AG	-	Poaceae
<i>Azolla filiculoides</i>	Pacific Mosquitofern	F	OBL	Azollaceae
<i>Brachypodium distachyon</i> *	Purple False Brome	A/PG	-	Poaceae
<i>Brassica nigra</i> *	Black Mustard	AH	-	Brassicaceae
<i>Brassica rapa</i> *	Field Mustard	AH	-	Brassicaceae
<i>Briza minor</i> *	Little Quakinggrass	AG	FACW-	Poaceae
<i>Brodiaea coronaria</i>	Harvest Brodiaea	PH	(FAC)	Liliaceae
<i>Bromus carinatus</i>	California Brome	AG	-	Poaceae
<i>Bromus diandrus</i> *	Ripgut Brome	AG	(FACU)	Poaceae
<i>Bromus hordeaceus</i> *	Soft Brome	AG	FACU-	Poaceae
<i>Bromus madritensis</i> ssp. <i>rubens</i> *	Red Brome	AG	NI	Poaceae
<i>Callitriche marginata</i>	Winged Water-starwort	AH	OBL	Callitrichaceae

⁶ * = Introduced plant species that have become naturalized. Scientific names of the plant species follow Hickman (1993) and Flora of North America Committee (1993-2007). Brackets [] indicate previous nomenclature and follow the most recent nomenclature.

⁷ Habit definitions: AG = annual grass or graminoid; AH = annual herb; AV = annual vine; F = fern and fern ally; PG = perennial grass or graminoid; PH = perennial herb; PV = perennial vine; S = shrub; T = tree.

⁸ WIS = Wetland Indicator Status. The following code definitions are according to Reed (1988):

OBL = obligate wetland species, occurs almost always in wetlands (>99% probability).

FACW = facultative wetland species, usually found in wetlands (67-99% probability).

FAC = facultative species, equally likely to occur in wetlands or nonwetlands (34-66% probability).

FACU = facultative upland species, usually found in nonwetlands (67-99% probability).

UPL = obligate upland species in this region (99% probability), occurs in wetlands in another region

NI = no indicator status has been assigned due to a lack of information.

+ or - symbols are modifiers that indicate greater or lesser affinity for wetland habitats.

* = tentative assignment to that indicator status by Reed (1988).

() Parentheses indicate a wetland status suggested by David L. Magney based on extensive field observations.

Scientific Name ⁶	Common Name	Habit ⁷	WIS ⁸	Family
<i>Carduus pycnocephalus</i> *	Italian Thistle	AH	-	Asteraceae
<i>Castilleja attenuata</i>	Valley Tassels	AH	-	Orobanchaceae
<i>Castilleja campestris</i> ssp. <i>campestris</i>	Field Owl's Clover	AH	OBL*	Orobanchaceae
<i>Centaurea solstitialis</i> *	Yellow Star-thistle	AH	-	Asteraceae
<i>Centaurium muhlenbergii</i>	Monterey Centaury	AH	FAC	Gentianaceae
<i>Cerastium glomeratum</i> *	Mouse-ear Chickweed	AH	FACU	Caryophyllaceae
<i>Chamomilla suaveolens</i> *	Pineapple Weed	AH	FACU	Asteraceae
<i>Chenopodium album</i> *	Lambsquarters	AH	FAC	Chenopodiaceae
<i>Cichorium intybus</i> *	Chicory	PH	-	Asteraceae
<i>Cirsium vulgare</i> *	Bull Thistle	PH	FACU	Asteraceae
<i>Convolvulus arvensis</i> *	Bind Weed	PV	-	Convolvulaceae
<i>Cortaderia selloana</i> *	Uruguayan Pampas Grass	PG	-	Poaceae
<i>Crassula tillaea</i> *	Water Pygmy-weed	AH	NI*	Crassulaceae
<i>Crypsis schoenoides</i> *	Swamp Grass	AG	OBL	Poaceae
<i>Cynodon dactylon</i> *	Bermuda Grass	PG	FAC	Poaceae
<i>Cyperus eragrostis</i>	Umbrella-sedge	PG	FACW	Cyperaceae
<i>Daucus carota</i> *	Queen Anne's Lace	PH	-	Apiaceae
<i>Deschampsia danthonioides</i>	Annual Hairgrass	AG	FACW	Poaceae
<i>Eleocharis macrostachya</i>	Creeping or Pale Spikerush	PG	OBL	Cyperaceae
<i>Epilobium brachycarpum</i>	Tall Annual Willow-herb	AH	UPL	Onagraceae
<i>Epilobium ciliatum</i>	Northern Willow-herb	PH	FACW	Onagraceae
<i>Epilobium densiflorum</i>	Dense-flowered Willow-herb	AH	OBL	Onagraceae
<i>Epilobium pygmaeum</i>	Smooth Spike-primrose	AH	OBL	Onagraceae
<i>Eremocarpus setigerus</i>	Dove Weed	AH	-	Euphorbiaceae
<i>Erodium botrys</i> *	Broadleaf Filaree	AH	-	Geraniaceae
<i>Erodium moschatum</i> *	Whitestem Filaree	AH	-	Geraniaceae
<i>Erucastrum [Hirschfeldia] incana</i> *	Summer Mustard	PH	-	Brassicaceae
<i>Eryngium vaseyi</i>	Coyotethistle	PH	FACW	Apiaceae
<i>Eschscholzia californica</i>	California Poppy	A/PH	-	Papaveraceae
<i>Eucalyptus camaldulensis</i> *	River Red Gum	T	-	Myrtaceae
<i>Eucalyptus globulus</i> *	Blue Gum	T	-	Myrtaceae
<i>Euphorbia spathulata</i>	Warty Spurge	AH	-	Euphorbiaceae
<i>Festuca arundinacea</i> *	Tall Fescue	PG	FAC-	Poaceae
<i>Fraxinus latifolia</i>	Oregon Ash	T	FACW	Oleaceae
<i>Galium aparine</i>	Goose Grass	AH	FACU	Rubiaceae
<i>Geranium dissectum</i> *	Cut-leaved Geranium	AH	-	Geraniaceae
<i>Glyceria declinata</i> *	Waxy Mannagrass	PG	-	Poaceae
<i>Gnaphalium palustre</i>	Lowland Cudweed	AH	FACW	Asteraceae
<i>Gratiola ebracteata</i>	Bractless Hedgehyssop	AH	OBL	Scrophulariaceae
<i>Grindelia camporum</i>	Great Valley Gumplant	PH	FACU	Asteraceae
<i>Hemizonia fitchii</i>	Fitch's Tarweed	AH	-	Asteraceae

Scientific Name ⁶	Common Name	Habit ⁷	WIS ⁸	Family
<i>Holocarpha virgata</i>	Yellowflower Tarweed	AH	-	Asteraceae
<i>Hordeum marinum</i> ssp. <i>gussoneanum</i> *	Mediterranean Barley	AG	FAC	Poaceae
<i>Hordeum murinum</i> *	Summer Barley	AG	NI	Poaceae
<i>Hypochaeris glabra</i> *	Smooth Cat's-ear	AH	-	Asteraceae
<i>Juglans californica</i>	Southern California Walnut	T	FAC	Juglandaceae
<i>Juncus balticus</i>	Baltic Rush	PG	OBL	Juncaceae
<i>Juncus bufonius</i>	Common Toad Rush	AG	OBL	Juncaceae
<i>Juncus capitatus</i> *	Leafybract Dwarf Rush	AG	FACU	Juncaceae
<i>Juncus effusus</i>	Common Rush	PG	OBL	Juncaceae
<i>Juncus xiphioides</i>	Iris-leaved Rush	PG	OBL	Juncaceae
<i>Kickxia elatine</i> *	Sharpleaf Cancerwort	AH	NI*	Veronicaceae
<i>Lactuca serriola</i> *	Prickly Wild Lettuce	AH	FAC	Asteraceae
<i>Lasthenia fremontii</i>	Fremont's Goldfields	A/PH	OBL	Asteraceae
<i>Lasthenia glaberrima</i>	Smooth Goldfields	AH	OBL	Asteraceae
<i>Lathyrus angulatus</i> *	Angled Pea	AV	-	Fabaceae
<i>Lemna minuscula</i>	Least Duckweed	PH	OBL	Lemnaceae
<i>Leontodon taraxacoides</i> *	Hawkbit	A/B/PH	FACU	Asteraceae
<i>Lepidium nitidum</i>	Common Peppergrass	AH	-	Brassicaceae
<i>Lolium multiflorum</i> *	Italian Ryegrass	AG	FAC*	Poaceae
<i>Lotus corniculatus</i> *	Birdsfoot Trefoil	PH	FAC	Fabaceae
<i>Lotus purshianus</i>	Spanish Clover	AH	UPL	Fabaceae
<i>Ludwigia peploides</i>	Floating Water-primrose	PH	OBL	Onagraceae
<i>Lythrum hyssopifolium</i> *	Hyssop Loosestrife	AH	FACW	Lythraceae
<i>Malva parviflora</i> *	Cheeseweed	AH	-	Malvaceae
<i>Medicago polymorpha</i> *	Burclover	AH	-	Fabaceae
<i>Mentha pulegium</i> *	Pennyroyal	PH	OBL	Lamiaceae
<i>Morus alba</i> *	White Mulberry	T	NI	Moraceae
<i>Navarretia leucocephala</i>	Whitehead Navarretia	AH	OBL	Polemoniaceae
<i>Olea europaea</i> *	Olive	T	-	Oleaceae
<i>Paspalum dilatatum</i> *	Dallisgrass	PG	FAC	Poaceae
<i>Phalaris aquatica</i> *	Bulbous Canarygrass	PG	FAC+	Poaceae
<i>Phyla nodiflora</i>	Turkey Tangle Fogfruit	PH	FACW	Verbenaceae
<i>Phytolacca mericana</i> *	American Pokeweed	PH	NI	Phytolaccaceae
<i>Picris echioides</i> *	Bristly Ox-tongue	AH	(FAC)	Asteraceae
<i>Pinus sabiniana</i>	California Foothill Pine	T	-	Pinaceae
<i>Plagiobothrys stipitatus</i>	Stalked Popcornflower	AH	OBL	Boraginaceae
<i>Plantago erecta</i>	California Plantain	AH	-	Plantaginaceae
<i>Plantago lanceolata</i> *	English Plantain	PH	FAC-	Plantaginaceae
<i>Poa annua</i> *	Annual Bluegrass	AG	FACW-	Poaceae
<i>Polygonum arenastrum</i> *	Common Knotweed	AH	FAC	Polygonaceae
<i>Polygonum hydropiperoides</i>	Swamp Smartweed	PH	OBL	Polygonaceae

Scientific Name ⁶	Common Name	Habit ⁷	WIS ⁸	Family
<i>Polygonum punctatum</i>	Dotted Smartweed	A/PH	OBL	Polygonaceae
<i>Polypogon monspeliensis</i> *	Rabbitsfoot Grass	AG	FACW+	Poaceae
<i>Populus alba</i> *	White Poplar	T	-	Salicaceae
<i>Populus fremontii</i>	Fremont's Cottonwood	T	FACW	Salicaceae
<i>Pseudognaphalium luteo-album</i> *	Everlasting Cudweed	AH	FACW-	Asteraceae
<i>Psilocarphus brevissimus</i>	Dwarf Woollyheads	AH	OBL	Asteraceae
<i>Punica granatum</i> *	Pomegranate	S	-	Punicaceae
<i>Quercus lobata</i>	Valley Oak	T	FAC*	Fagaceae
<i>Quercus wislizenii</i> +	Interior Live Oak	S/T	-	Fagaceae
<i>Ranunculus bonariensis</i>	Carter's Buttercup	AH	OBL	Ranunculaceae
<i>Ranunculus muricatus</i> *	Spinyfruit Buttercup	A/B/PH	FACW+	Ranunculaceae
<i>Raphanus raphanistrum</i> *	Wild Radish	A/PH	-	Brassicaceae
<i>Raphanus sativus</i> *	Radish	A/BH	-	Brassicaceae
<i>Robinia pseudoacacia</i> *	Black Locust	T	FAC*	Fabaceae
<i>Rosa spp.</i> *	Cultivated Rose	S	-	Rosaceae
<i>Rubus discolor</i> *	Himalaya Blackberry	S	FACW*	Rosaceae
<i>Rumex acetosella</i> *	Common Sheep Sorrel	PH	FAC-	Polygonaceae
<i>Rumex crispus</i> *	Curly Dock	PH	FACW-	Polygonaceae
<i>Rumex pulcher</i> *	Fiddle Dock	PH	FAC+	Polygonaceae
<i>Salix exigua</i>	Narrow-leaved Willow	S/T	OBL	Salicaceae
<i>Salix gooddingii</i>	Goodding's Black Willow	T	OBL	Salicaceae
<i>Schinus molle</i> *	Peruvian Pepper Tree	T	-	Anacardiaceae
<i>Schoenoplectus [Scirpus] acutus</i>	Hardstem Bulrush	PH	OBL	Cyperaceae
<i>Senecio vulgaris</i> *	Common Groudsel	AH	-	Asteraceae
<i>Silene gallica</i> *	Windmill Pink	AH	-	Caryophyllaceae
<i>Silybum marianum</i> *	Milk Thistle	AH	-	Asteraceae
<i>Sonchus oleraceus</i> *	Common Sow-thistle	AH	NI*	Asteraceae
<i>Sorghum halepense</i> *	Johnsongrass	PG	FACU	Poaceae
<i>Spergularia rubra</i> *	Purple (Red) Sandspurrey	A/PH	FAC-	Caryophyllaceae
<i>Stellaria media</i> *	Common Chickweed	AH	FACU	Caryophyllaceae
<i>Taeniatherum caput-medusae</i> *	Medusahead	AG	-	Poaceae
<i>Tanacetum parthenium</i> *	Feverfew	PH	-	Asteraceae
<i>Taraxacum officinale</i> *	Dandelion	PH	FACU	Asteraceae
<i>Trichostema lanceolatum</i>	Vinegarweed	AH	-	Lamiaceae
<i>Trifolium dubium</i> *	Suckling Clover	AH	FACU*	Fabaceae
<i>Trifolium hirtum</i> *	Rose Clover	AH	-	Fabaceae
<i>Trifolium repens</i> *	White Clover	PH	FACU+	Fabaceae
<i>Triteleia hyacinthina</i>	White Brodiaea	PH	FACW*	Liliaceae
<i>Triteleia laxa</i>	Ithuriel's Spear	PG	-	Liliaceae
<i>Typha latifolia</i>	Cattail	PH	OBL	Typhaceae

Scientific Name ⁶	Common Name	Habit ⁷	WIS ⁸	Family
<i>Veronica anagallis-aquatica</i> *	Water Speedwell	PH	OBL	Veronicaceae
<i>Veronica peregrina</i>	Neckweed	AH	OBL	Veronicaceae
<i>Vicia sativa</i> *	Common Vetch	AH	FACU	Fabaceae
<i>Vicia villosa</i> *	Hairy Vetch	AH	-	Fabaceae
<i>Vinca major</i> *	Greater Periwinkle	PH	(FAC)	Apocynaceae
<i>Vitis vinifera</i> *	Cultivated Grape	PV	-	Vitaceae
<i>Vulpia bromoides</i> *	Brome Fescue	AG	FACW	Poaceae
<i>Wyethia angustifolia</i>	California Compassplant	PH	FACU-	Asteraceae
<i>Xanthium strumarium</i>	Cocklebur	AH	FAC+	Asteraceae

Table 3. Plant Species of the Gosal Estates Parcel

Scientific Name	Common Name	Habit	WIS	Family
<i>Avena fatua</i> *	Wild Oat	AG	-	Poaceae
<i>Brassica nigra</i> *	Black Mustard	AH	-	Brassicaceae
<i>Bromus diandrus</i> *	Ripgut Brome	AG	(FACU)	Poaceae
<i>Bromus hordeaceus</i> *	Soft Brome	AG	FACU-	Poaceae
<i>Centaurea solstitialis</i> *	Yellow Star-thistle	AH	-	Asteraceae
<i>Chamomilla suaveolens</i> *	Pineapple Weed	AH	FACU	Asteraceae
<i>Convolvulus arvensis</i> *	Bind Weed	PV	-	Convolvulaceae
<i>Eremocarpus setigerus</i>	Dove Weed	AH	-	Euphorbiaceae
<i>Erodium botrys</i> *	Broadleaf Filaree	AH	-	Geraniaceae
<i>Eschscholzia californica</i>	California Poppy	A/PH	-	Papaveraceae
<i>Eucalyptus camaldulensis</i> *	River Red Gum	T	-	Myrtaceae
<i>Eucalyptus globulus</i> *	Blue Gum	T	-	Myrtaceae
<i>Geranium dissectum</i> *	Cut-leaved Geranium	AH	-	Geraniaceae
<i>Hemizonia fitchii</i>	Fitch's Tarweed	AH	-	Asteraceae
<i>Holocarpha virgata</i>	Yellowflower Tarweed	AH	-	Asteraceae
<i>Hordeum marinum</i> ssp. <i>gussoneanum</i> *	Mediterranean Barley	AG	FAC	Poaceae
<i>Kickxia elatine</i> *	Sharpleaf Cancerwort	AH	NI*	Veronicaceae
<i>Leontodon taraxacoides</i> *	Hawkbit	A/B/PH	FACU	Asteraceae
<i>Lolium multiflorum</i> *	Italian Ryegrass	AG	FAC*	Poaceae
<i>Lythrum hyssopifolium</i> *	Hyssop Loosestrife	AH	FACW	Lythraceae
<i>Medicago polymorpha</i> *	Burclover	AH	-	Fabaceae
<i>Navarretia leucocephala</i>	Whitehead Navarretia	AH	OBL	Polemoniaceae
<i>Raphanus sativus</i> *	Radish	A/BH	-	Brassicaceae
<i>Rumex crispus</i> *	Curly Dock	PH	FACW-	Polygonaceae
<i>Senecio vulgaris</i> *	Common Groundsel	AH	-	Asteraceae
<i>Taeniatherum caput-medusae</i> *	Medusahead	AG	-	Poaceae
<i>Vicia sativa</i> *	Common Vetch	AH	FACU	Fabaceae

Scientific Name	Common Name	Habit	WIS	Family
<i>Vicia villosa</i> *	Hairy Vetch	AH	-	Fabaceae
<i>Vulpia bromoides</i> *	Brome Fescue	AG	FACW	Poaceae
<i>Xanthium strumarium</i>	Cocklebur	AH	FAC+	Asteraceae

FAUNA

Wildlife known, or with the potential, to occur in the South Sacramento Habitat Conservation Plan (SSHCP) area are discussed in the SSHCP Habitat Analysis Documents, and some wildlife have been observed onsite by DMEC and ECORP. Table 4, Observed Wildlife and SSHCP Species Potentially Occurring Onsite, lists a total of fifty-eight (58) wildlife species and eight (8) taxonomic groups. Focused wildlife surveys would be required to definitively determine which species inhabit and frequent the project site. Table 5, Wildlife Observed on the Gosal Estates Parcel, lists the four (4) species observed there by DMEC on 19 February 2008.

Table 4. Observed Wildlife and SSHCP Species Potentially Occurring Onsite

Scientific Name ⁹	Common Name
<i>Amphibians</i>	
<i>Ambystoma californiense</i>	California Tiger Salamander
<i>Bufo boreas</i>	Western Toad
<i>Hyla regilla</i>	Pacific Treefrog
<i>Spea [Scaphiopus] hammondii</i>	Western Spadefoot Toad
<i>Reptiles</i>	
<i>Actinemys [Emys] marmorata</i> ssp. <i>marmorata</i>	Northwestern Pond Turtle
<i>Thamnophis gigas</i>	Giant Garter Snake
<i>Birds</i>	
<i>Accipiter cooperi</i>	Cooper's Hawk
<i>Accipiter striatus</i>	Sharp-Shinned Hawk
<i>Aechmophorus</i> spp.	Grebes
<i>Agelaius tricolor</i>	Tricolored Blackbird
<i>Anas platyrhynchos</i>	Mallard
<i>Aquila chrysaetos</i>	Golden Eagle
<i>Ardea alba</i>	Great Egret
<i>Ardea Herodias</i>	Great Blue Heron
<i>Asio flammeus</i>	Short-eared Owl
<i>Asio otus</i>	Long-eared Owl
<i>Athene cunicularia hypugea</i>	Western Burrowing Owl
<i>Buteo jamaicensis</i>	Red-tailed Hawk

⁹ An asterisk (*) indicates introduced, nonnative species. **Bold type** indicates species observed onsite.

Scientific Name ⁹	Common Name
<i>Buteo regalis</i>	Ferruginous Hawk
<i>Buteo swainsoni</i>	Swainson's Hawk
<i>Circus cyaneus</i>	Northern Harrier
<i>Egretta thula</i>	Snowy Egret
<i>Elanus leucurus</i>	White-tailed Kite
<i>Eremophila alpestris</i>	Horned Lark
<i>Euphagus cyanocephalus</i>	Brewer's Blackbird
<i>Falco columbarius</i>	Merlin
<i>Falco peregrinus anatum</i>	American Peregrine Falcon
<i>Fulica americana</i>	American Coot
<i>Grus canadensis tabida</i>	Greater Sandhill Crane
<i>Haliaeetus leucocephalus</i>	Bald Eagle
<i>Icteria virens</i>	Yellow Breasted Chat
<i>Lanius ludovicianus</i>	Loggerhead Shrike
<i>Pelecanus erythrorhynchos</i>	American White Pelican
<i>Plegadis chihi</i>	White-faced Ibis
<i>Rallus</i> spp.	Rails
<i>Sturnella neglecta</i>	Western Meadowlark
<i>Sturnus vulgaris</i> *	European Starling
Mammals	
<i>Antrozous pallidus</i>	Pallid Bat
<i>Bassariscus astutus</i>	Ringtail
<i>Canis latrans</i>	Coyote
<i>Castor canadensis</i>	Beaver
<i>Lasiurus blossevillii</i>	Western Red Bat
<i>Lepus californicus</i>	Blacktail Jackrabbit
<i>Microtus californicus</i>	California Vole
<i>Mus musculus</i> *	House Mouse
<i>Myotis yumanensis</i>	Yuma Myotis Bat
<i>Peromyscus maniculatus</i>	Deer Mouse
<i>Reithrodontomys megalotis</i>	Western Harvest Mouse
<i>Sorex ornatus</i>	Ornate Shrew
<i>Spermophilus beecheyi</i>	California Ground Squirrel
<i>Taxidea taxus</i>	American Badger
<i>Urocyon cinereoargenteus</i>	Gray Fox
Invertebrates	
Andrenidae (Family)	Andrenid or Mining bees
Anisoptera (Suborder)	Dragonflies
<i>Branchinecta mesovallensis</i>	Mid-valley Fairy Shrimp
<i>Branchinecta lynchi</i>	Vernal Pool Fairy Shrimp
Corixidae (Family)	Water Boatman
<i>Desmocerus californicus dimorphus</i>	Valley Elderberry Longhorn Beetle
Dytiscidae (Family)	Predaceous Diving Beetle

Scientific Name ⁹	Common Name
<i>Hydrochara rickseckeri</i>	Ricksecker's Water Scavenger Beetle
<i>Lepidurus packardi</i>	Vernal Pool Tadpole Shrimp
<i>Linderiella occidentalis</i>	California Linderiella
<i>Notonecta undulata</i>	Backswimmer
<i>Procambarus clarkii</i> *	Red Swamp Crayfish
Zygoptera (Suborder)	Damselflies
Unknown	Aquatic Freshwater Snail

Table 5. Wildlife Observed on the Gosal Estates Parcel

Scientific Name	Common Name
<i>Amphibians</i>	
<i>Hyla regilla</i>	Pacific Treefrog
<i>Mammals</i>	
<i>Lepus californicus</i>	Blacktail Jackrabbit
<i>Microtus californicus</i>	California Vole
<i>Spermophilus beecheyi</i>	California Ground Squirrel

HABITATS

General habitats found onsite, and in the immediate vicinity of the NVG project site, include grassland, wetland areas, and remnants of past agricultural operations. Figure 4, Map of Vegetation and Land Cover Types on Project Site, illustrates the habitat types and associated plant communities that contribute to the landscape of the project site. They are discussed in the following subsections and include:

- Grassland
 - Valley Grassland
 - Vernal Pool Grassland
- Wetlands
 - Seasonal Wetlands and Swales
 - Seasonal Marsh
 - Vernal Pools
 - Riparian
- Agricultural
 - Fallow Land
 - Agricultural Wetlands

Grassland

Grassland consists of herbaceous vegetation dominated by annual grasses and forbs. Annual grasslands in the Central Valley grow primarily during the early spring through early summer, with most of the grass species completing their life cycles by the end of spring. Grasslands at the project site consist of Valley Grassland and Vernal Pool Grassland, which are described below.

Valley Grassland

Valley Grassland (*Lolium multiflorum* Alliance [Sawyer and Keeler-Wolf 1995]) habitat is the most widespread natural habitat throughout the undeveloped lowlands and rolling hills in the general area of the NVG project site. Valley Grassland is dominated by several common nonnative annual grasses, with other native and nonnative grasses and numerous forbs also present. Grasses typically dominant in Valley Grassland that have been reported onsite include bromes (*Bromus diandrus*, *B. hordeaceus*), Wild Oats (*Avena barbata*, *A. fatua*), barley (*Hordeum marinum*, *H. murinum*), Italian Ryegrass (*Lolium multiflorum*), and Brome Fescue (*Vulpia bromoides*).

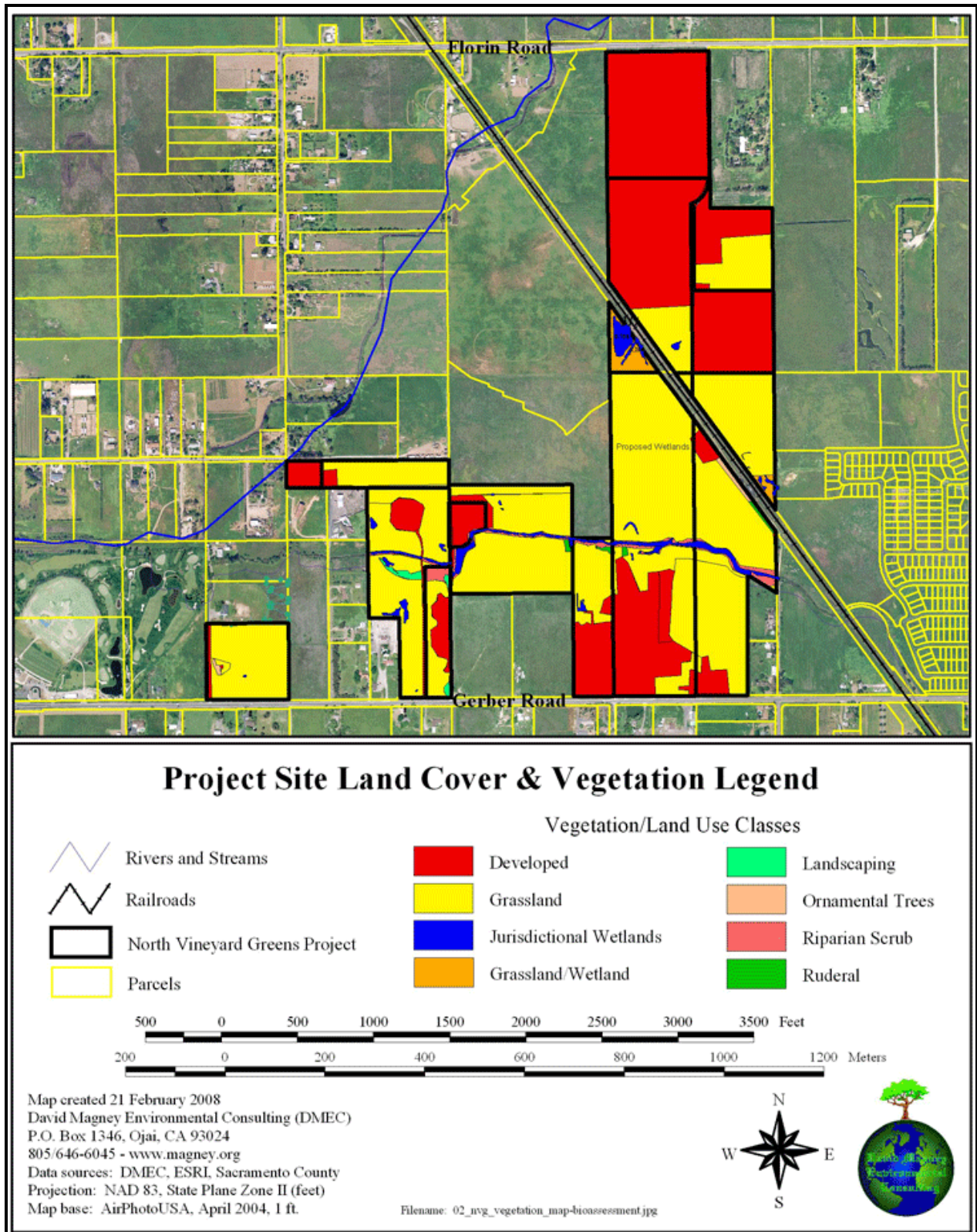
Other nonnative grasses that are commonly associated with Valley Grassland reported onsite include *Aira caryophyllea*, *Briza minor*, *Cynodon dactylon*, *Poa annua*, and *Taeniatherum caput-medusae*. Non-native forbs representative of this community onsite include: mustards (*Brassica* spp.), radishes (*Raphanus* spp.), filarees (*Erodium* spp.), clovers (*Trifolium* spp.), vetches (*Vicia* spp.), Tocalote (*Centaurea solstitialis*), as well as several other species. Associated native forbs onsite include: *Eremocarpus setigerus*, *Holocarpha virgata*, *Lotus purshianus*, and *Trichostema lanceolatum*.

Additional native species onsite that commonly occur in grasslands include: *Amsinckia menziesii*, *Asclepias fascicularis*, *Brodiaea coronaria*, *Bromus carinatus*, *Castilleja attenuata*, *Epilobium brachycarpum*, *Galium aparine*, *Grindelia camporum*, *Hemizonia fitchii*, *Lepidium nitidum*, *Plantago erecta*, and *Triteleia laxa*.

Vernal Pool Grassland

The habitat subtype Vernal Pool Grassland occurs on a few distinctive landscape formations, most often alluvial formations such as the Lower Unit Riverbank Formation that includes the project site. Vernal Pool Grassland has two distinct components: an upland grassland component, and a wetland component associated with vernal pools and vernal swales. The upland grassland component is very similar to Valley Grassland (see Valley Grassland above), and only differs in areas influenced by and immediately adjacent to vernal pools and swales.

Figure 4. Map of Vegetation and Land Cover Types on Project Site



A distinctive association of grasses and forbs, both native and non-native, characterizes the wetland component. Native species commonly a part of this association onsite include: *Deschampsia danthonioides*, *Lasthenia* spp., *Juncus bufonius*, and *Hemizonia fitchii*, with non-natives *Leontodon taraxacoides*, *Juncus capitatus*, *Lythrum hyssopifolium*, and *Hordeum marinum*.

Wetlands

Wetland plant communities onsite are found in seasonal wetland, seasonal wetland swale, seasonal marsh, vernal pool, and riparian habitats.

Seasonal Wetlands and Swales

Seasonal wetlands and swales are typically found in flat to gently rolling grasslands where water pools in depressions or flows overland via shallow, ephemeral drainages. These wetland habitats tend to form on shallow soils with an impermeable clay or hardpan layer below and are often associated with vernal pool complexes. Because of their close association with vernal pools, seasonal swales may serve as conduits for the movement of plant propagules and wildlife between vernal pools. These wetlands may fill and empty several times per year as a result of seasonal weather patterns. Soils remain saturated during cool, wet periods, and then dry through a combination of surface run-off and evapotranspiration in warm, dry periods.

Some seasonal wetlands develop as a result of human activities such as scraping or grading in grasslands, which creates artificial depressions with shallow soil. Disturbed wetlands tend to have weedy or ruderal plant species such as: *Lythrum hyssopifolium*, *Lolium multiflorum*, *Hordeum marinum*, *Polypogon monspeliensis*, *Glyceria declinata*, and *Rumex crispus*, all of which are reported or were observed on the NVG site. Seasonal swales associated with vernal pools support some of the same native plants commonly found in vernal pools, and two such plants, *Deschampsia danthonioides* and *Plagiobothrys stipitatus*, are known onsite.

Additional native species onsite that commonly occur in seasonal wetlands and swales include *Centaureum muhlenbergii*, *Cyperus eragrostis*, *Epilobium ciliatum*, *E. densiflorum*, *Gnaphalium palustre*, *Juncus balticus*, *J. bufonius*, *J. effusus*, *J. xiphioides*, *Phyla nodiflora*, *Triteleia hyacinthina*, *Veronica peregrina*, and *Xanthium strumarium*.

Seasonal Marsh

Seasonal marshes have many of the characteristics of seasonal wetlands and swales described above. Seasonal marshes are seasonally flooded with shallow water (<2m depth) and soils are saturated most or all of the time. Soils are anaerobic clays and silts that support a characteristic assemblage of upright, perennial monocots. Representative species onsite include: *Juncus effusus*, *J. xiphioides*, *Polygonum hydropiperoides*, *P. punctatum*, *Schoenoplectus* [*Scirpus*] *acutus*, *Typha latifolia*, and *Xanthium strumarium*.

Additional native species onsite that commonly occur in seasonal marshes include: *Callitriche marginata*, *Cyperus eragrostis*, *Eleocharis macrostachya*, *Ludwigia peploides*, and *Ranunculus bonariensis*.

Vernal Pools

Vernal pools are characterized by their physical characteristics and the unique assemblages of highly specialized endemic plants and animals associated with them. Vernal pools develop in depressional basins on soils with an impermeable hardpan or claypan (or both) layer that restricts the downward percolation of water. Cool, wet winters and warm, extremely dry summers create cycles of inundation and drying of pool basins and soil profiles.

Species associated with smaller, shallower vernal pools intergrade with less specialized and often non-native seasonal wetland species, and, at higher and drier positions, with upland annual grassland vegetation (see Vernal Pool Grassland above). At lower, wetter positions, the species associated with larger and deeper vernal pools intergrade with seasonal marshes and swales (see descriptions above). The vernal pools onsite are of the small/shallow type.

Native species commonly associated with the vernal pools found in the area of the project site that are reported to be present include: *Callitriche marginata*, *Castilleja campestris* ssp. *campestris*, *Deschampsia danthonioides*, *Eleocharis macrostachya*, *Gratiola ebracteata*, *Lasthenia fremontii*, *L. glaberrima*, *Plagiobothrys stipitatus*, *Psilocarphus brevissimus*, and *Ranunculus bonariensis*. Several sensitive, uncommon plant species are known to occur in vernal pools in the vicinity of the project, but none are known on the NVG site.

Additional native species onsite that commonly occur in vernal pool habitat include: *Epilobium ciliatum*, *E. densiflorum*, *Juncus bufonius*, *Triteleia hyacinthina*, and *Veronica peregrina*.

Riparian

Riparian vegetation typically intergrades with emergent marsh and permanent or seasonal wetlands at lower and wetter positions, and with upland vegetation types at higher and drier positions. Streambed sediment bars serve as recruitment surfaces for woody riparian species, particularly willows (*Salix* spp) and *Populus fremontii*. Riparian sites in a natural state located within the Lower Unit Riverbank Formation typically support thick riparian woodland and scrub associations. *Acer negundo*, *Alnus rhombifolia*, *Fraxinus latifolia*, *Juglans californica*, *Populus fremontii*, *Quercus* spp., *Salix* spp, and *Vitis californica* are native riparian woodland species that are found onsite, which may be remnants of historic riparian woodlands.

Seasonal drainages may have enough runoff to support some hydrophytic species, but may not be able to support riparian woodlands. These seasonal drainages can flow through annual grasslands that include marginally hydrophytic non-native species such as *Lolium multiflorum* and *Hordeum marinum* ssp. *gussoneanum*. Gerber Creek, which occurs onsite in the southern and central portions of NVG Units 1 and 3, is a seasonal drainage that is largely unvegetated, with non-native *Rubus discolor* present along the banks.

Agricultural

Fallow Land

Fallow land includes farmland temporarily held out of production, non-producing areas adjacent to land that is actively farmed, and abandoned farmlands that were once in production. In general, fallow agricultural lands support weedy species and annual grassland species, many of which were observed onsite. Fallow land is typically not tilled or irrigated, though sometimes it may be mowed or disced (especially along public roads and fence lines) to create firebreaks.

Agricultural Wetlands

Agricultural wetlands are generally associated with irrigation canals, drainage ditches, and impoundments such as stock and tailwater ponds. The overall values of agricultural wetlands can be similar to those of naturally occurring wetlands as sources of seasonal or perennial water for dependent plant and wildlife species. The native species *Eleocharis macrostachya*, *Populus fremontii*, *Ranunculus bonariensis*, and *Salix* spp. are known onsite in association with agricultural wetlands.

WILDLIFE HABITAT RESOURCES

The onsite habitats described in the section above contain numerous attributes and resources that are important for particular wildlife species. Aquatic habitats, in addition to directly supporting aquatic species, are also an important source of water for many upland wildlife species. The following subsections discuss the amphibians, reptiles, birds, mammals, and invertebrates typically associated with the habitats found on the NVG project site.

Annual Grassland

Valley Grassland

The most numerous small mammal species that use Valley Grassland include *Spermophilus beecheyi*, *Microtus californicus*, *Peromyscus maniculatus*, and *Reithrodontomys megalotis*, with *Sorex ornatus* occurring in lesser numbers. *Mus musculus* also occurs regularly in Valley Grassland. These species are primarily herbivores; however, some, such as shrews, eat insects, and all are important prey for other species, such as raptors. The most abundant bird species occurring in Valley Grassland include: Brewer's Blackbird, European Starling, Horned Lark, Western Meadowlark, Red-tailed Hawk, and other raptors.

Sensitive species that complete their entire life cycle in Valley and Vernal Pool Grasslands include *Taxidea taxus* and *Athene cunicularia* ssp. *hypugea*. Sensitive species that use grasslands, primarily for foraging, and that nest or breed elsewhere, include: *Antrozous pallidus*,

Lasiurus blossevillii, *Myotis yumanensis*, *Elanus leucurus*, *Accipiter cooperi*, *A. striatus*, *Buteo regalis*, *B. swainsoni*, *Aquila chrysaetos*, *Falco columbarius*, *Lanius ludovicianus*, *Asio otus*, and *Agelaius tricolor*.

Vernal Pool Grassland

See the Valley Grassland subsection above for wildlife associated with the grassland component of Vernal Pool Grassland. Refer to the Vernal Pool subsection below for wildlife associated with the vernal pool component.

Wetlands

Seasonal Wetlands and Swales

Seasonal wetlands and swales are highly productive habitats that offer food, cover, nesting sites, and other resources for numerous amphibians, reptiles, birds, mammals, and invertebrates. Many resident and migratory bird species use these wetlands, including: White-faced Ibis, rails, American Coot, Greater Sandhill Crane, grebes, Great Blue Heron, and Great Egret. Northern Harrier and Short-eared Owl are known to forage and nest in these emergent wetlands. The lack of predatory fish in seasonal wetlands and swales, if their hydroperiods are sufficient, make them excellent breeding habitats for amphibians. Wetlands with short hydroperiods tend to support more invertebrates, which comprise a large portion of the diet of many wetland birds and other wildlife.

The quality and number of connections between wetlands is important to many wildlife species. Seasonal swales are often closely associated with vernal pools and may provide corridors for the movement of amphibians such as *Ambystoma californiense*, *Spea* [*Scaphiopus*] *hammondii*, and others between vernal pools. Snakes, salamanders, and turtles move between multiple wetlands to escape predation, heat stress, desiccation, or lack of food as wetlands dry. Many wetland birds move among wetlands to find better forage, avoid predators, and locate optimal nesting sites.

Seasonal Marsh

Seasonal marsh habitat offers wildlife resources that are much the same as those provided by seasonal wetlands and swales, and can contribute to the diversity and connectivity of wetlands in an area. *Thamnophis gigas* requires freshwater marsh as its primary habitat. Habitat requirements include: adequate water and dense wetland vegetation, such as cattails and rushes; grassy banks and openings in waterside vegetation for basking; and vegetated uplands for cover and refuge from flood waters during winter dormancy.

Vernal Pools

The following four species of amphibians are known to occur in vernal pools within the SSHCP study area: *Bufo boreas* and *Hyla regilla*, along with the vernal pool-dependent species *Ambystoma*

californiense and *Spea [Scaphiopus] hammondii*. Adults lay eggs in vernal pools when they are inundated, the eggs hatch, and the tadpoles mature before the pools dry. The newly matured and older surviving adults then migrate to upland rodent burrows to spend the summer in a state of dormancy.

The crustacean species *Branchinecta mesovallensis*, *Branchinecta lynchi*, and *Lepidurus packardii* also occur in the area and are dependent on vernal pool habitat. Other invertebrates associated with vernal pools include *Hydrochara rickseckeri* and many other aquatic insects. Some vernal pool plant species (including *Lasthenia*, *Downingia*, *Blennosperma*, and *Limnanthes*) are pollinated by specialist solitary bees in the family Andrenidae. These solitary bees nest in small tunnels excavated in uplands near vernal pools, and their eggs and larvae are dependent on the pollen of vernal pool plants for development. The plants, in turn, depend on the bees for pollination.

Some vernal pool species require a relatively extended inundation period for completion of their life cycles, and some are adapted to shorter inundation durations. *Ambystoma californiense*, *Spea hammondii*, and *Lepidurus packardii* require longer development periods afforded by larger, deeper vernal pools. *Branchinecta mesovallensis* and *Branchinecta lynchi* complete their life cycles in less time and are adapted to smaller, shallower vernal pools that dry more quickly. The vernal pools onsite are of the small/shallow type, possibly too small and flashy to support this two species of *Branchinecta* (Gause pers. comm. 2006, Helm pers. comm. 2007).

Riparian

Riparian habitat perhaps supports the greatest diversity of wildlife species in California. Many amphibians, reptiles, birds, mammals, and invertebrates are typically associated with relatively undisturbed riparian habitats within the SSHCP area. The riparian areas on the NVG site have been significantly degraded by human activity, though some associated features are still present. Remaining riparian woodland species contribute to the structural diversity of the project site, and provide food, cover, nesting sites, and other resources for numerous resident and migratory wildlife species. Swainson's Hawk frequently nests in riparian woodland, often in *Populus fremontii* or *Quercus lobata*.

Agricultural

Fallow Land

Fallow agricultural land typically supports weedy and annual grassland plant species, as well as large rodent populations. Such fallow land can provide important foraging habitat for *Buteo swainsoni* and other raptors, and Short-eared Owl and Western Burrowing Owl may forage or nest in these areas. *Sambucus mexicana*, host plant and critical habitat for *Desmocerus californicus dimorphus*, can become established on fallow agricultural land adjacent to streams and in river floodplains.

Agricultural Wetlands

Agricultural wetlands are generally associated with irrigation canals, drainage ditches, and impoundments such as stock and tailwater ponds. The overall values of agricultural wetlands can be

similar to those of naturally occurring wetlands as sources of seasonal or perennial water for dependent plant and wildlife species. Sensitive wildlife species that can be associated with agricultural wetlands and potentially occur onsite include: *Actinemys [Emys] marmorata* ssp. *marmorata*, *Thamnophis gigas*, Tricolored Blackbird, Greater Sandhill Crane, and White-faced Ibis.

JURISDICTIONAL WETLANDS

A wetland delineation and assessment was submitted to the U.S. Army Corps of Engineers (Corps) for the entire North Vineyard Station Specific Plan Area and any other parcels affected by the North Vineyard Station Drainage Master Plan (NVSDMP) on December 31, 2002, as part of the NVSDMP Corps Application. The project site wetlands were delineated by ECORP, Inc., of Rocklin, California (ECORP 2004), and verified by Corps, Sacramento District, in 2006.

A total of 1.60 acres of jurisdictional waters of the U.S., including wetlands, have been delineated on the NVG project site (Figure 5, NVG Project Site Wetland Delineation). Individual acreages for the onsite wetlands shown in Figures 4 and 5 are listed in Table 6, Acreages for Delineated NVG Wetlands. Refer to the sections above for descriptions of the biological resources associated with the onsite wetlands discussed in this section.

Vernal pools totaling 0.15 acre have been mapped within the non-irrigated pastures. Vernal pools are topographic basins within annual grassland that are typically underlain with an impermeable or semi-permeable hardpan or duripan layer. Vernal pools are inundated to depths of up to one foot throughout the wet season and are dry by late spring through the following wet season. The plant species composition within vernal pools is predominantly native annuals.

Seasonal wetlands are ephemerally wet areas where surface runoff and rainwater accumulate within low-lying areas or adjacent to larger creeks and streams. Some seasonal wetlands develop as a result of human activities such as scraping or grading in grasslands, which creates shallow artificial depressions. Disturbed wetlands tend to be dominated by non-native annual species. Jurisdictional seasonal wetlands totaling 0.52 acre have been mapped onsite.

A total of 0.01 acre of **seasonal wetland swale** was mapped on the project site. Seasonal swales are ephemerally wet, relatively shallow areas that often connect to other wetlands and/or drainages, and that typically occur as linear features. Seasonal swales generally have characteristics (depth, vegetation, hydrology, and soil) intermediate between associated wetlands and adjacent upland areas.

The **seasonal marsh** totals 0.92 acre, and is located just south of the Central California Traction Railroad Tracks. Plants within the seasonal marsh are typical seasonal wetland and moist soil species. This marsh is situated in a low-lying area of the project vicinity and, in addition to the runoff during the wet season, may also receive periodic runoff from the nursery throughout the year.

A man-made stock/fish pond and several drainage ditches are located in the eastern and northeastern portion of the project site. These waters are considered non-jurisdictional, as per the field verification visit on 12 August 2004 by the Corps. The man-made pond, and associated

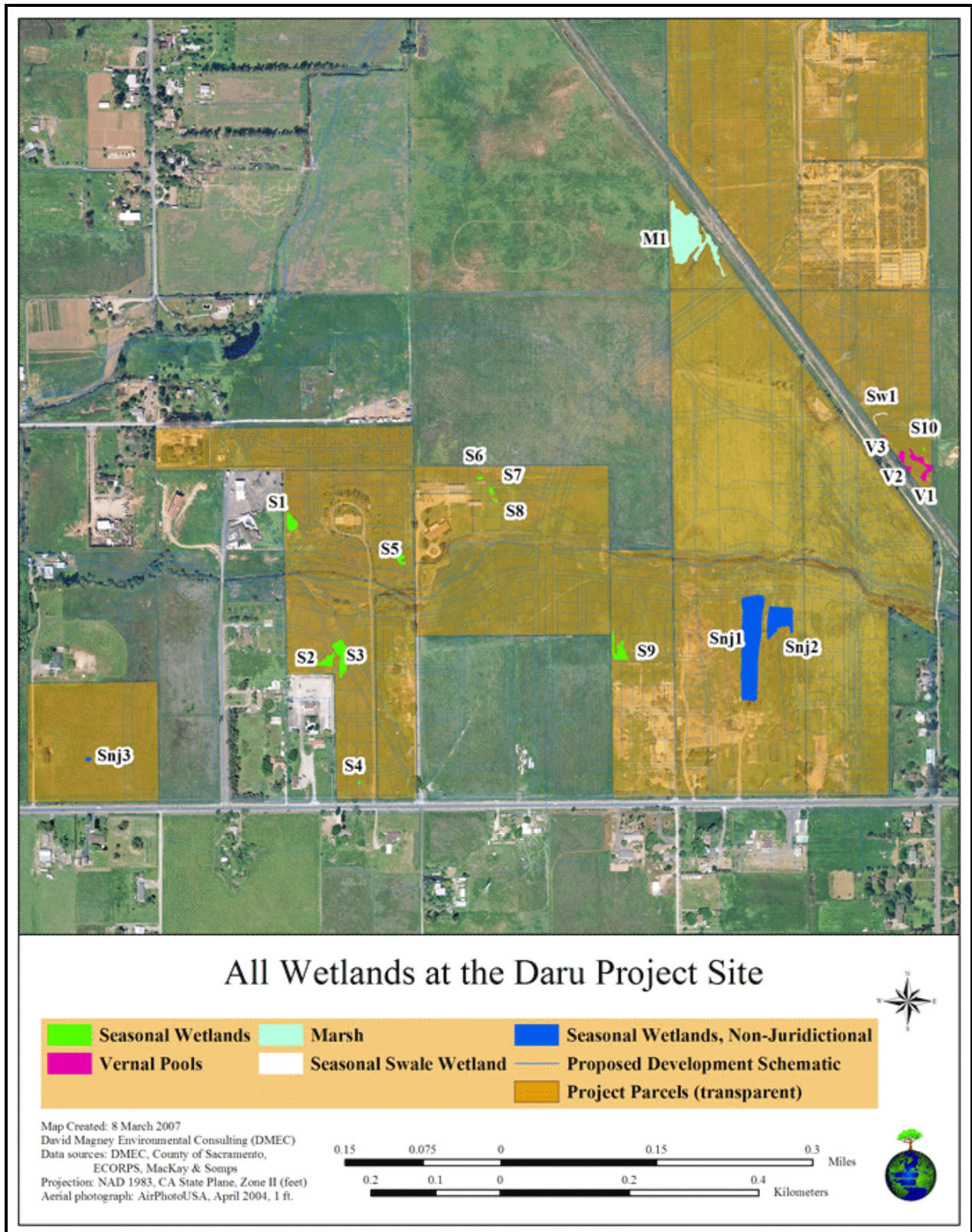
seasonal wetland adjacent to it in the southern portion of NVG Unit 1, is considered non-jurisdictional based on their isolation from waters of the U.S., and as determined by Ms. Andrea Jones, Regulatory Project Manager, U.S. Army Corps of Engineers, Sacramento, California.

Table 6. Acreages for Delineated NVG Wetlands

Wetland Type	Code¹⁰	Acreage	Subtotals
Vernal Pool	V1	0.10	0.15
	V2	0.04	
	V3	<0.005	
Seasonal Wetland	S1	0.08	0.52
	S2	0.09	
	S3	0.16	
	S4	<0.005	
	S5	0.04	
	S6	0.01	
	S7	0.02	
	S8	0.01	
	S9	0.10	
	S10	<0.005	
	S11	0.01	
	Snj1*	(1.13)	
	Snj2*	(0.35)	
Seasonal Wetland Swale	Sw1	0.01	0.01
Seasonal Marsh	M1	0.92	0.92
Mitigation Plan Total Acres			1.60

¹⁰ Labeling code used in Figure 5 to identify individual wetlands. * = Not included in the total of 1.60 acres of existing seasonal wetlands to be mitigated; 1.48 acres (Snj 1 and Snj 2) are expected to be classified as non-jurisdictional by the Corps. Note: the small seasonal wetland in the Gosal Estates parcel, labeled Snj3, is likely not Corps jurisdictional due to lack of a hydrologic connection to waters of the U.S.; however, it is being treated here as if jurisdictional.

Figure 5. NVG Project Site Wetland Delineation



SECTION IV. SPECIAL-STATUS BIOLOGICAL RESOURCES

This section discusses the definitions of special-status biological resources and addresses the special-status biological resources observed, reported, or having the potential to occur on the project site. These resources include plant and wildlife species and habitats that have been afforded special-status and/or recognition by federal and state resource agencies, as well as private conservation organizations. In general, the principal reason an individual taxon (i.e. species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size, geographic range, and/or distribution resulting in most cases from habitat loss.

DEFINITIONS

Special-status habitats are vegetation types, associations, or sub-associations that support concentrations of special-status plant or wildlife species, are of relatively limited distribution, or are of particular value to wildlife.

Special-status species are plants and animals that are at least one of the following:

- *Listed as Endangered or Threatened* under Federal or California Endangered Species Acts,
- *Listed as Rare* under the California Native Plant Protection Act, or
- *Considered rare* (but not formally listed) by resource agencies, professional organizations (e.g. Audubon Society, California Native Plant Society [CNPS], The Wildlife Society), and the scientific community.

Listed species are those taxa that are formally listed as Endangered or Threatened by the federal government (e.g. USFWS), pursuant to the Federal Endangered Species Act (ESA) or as Endangered, Threatened, or Rare (for plants only) by the State of California (i.e. California Fish and Game Commission), pursuant to the California Endangered Species Act (CESA) or the California Native Plant Protection Act, or those formally adopted by a local (e.g. county or city government) agency as of local concern or rare, or similar status. Special-status species are defined in Table 7, Definitions of Special-Status Species.

The CNPS' *Inventory of Rare and Endangered Plants of California* (CNPS 2001, 2008) categorizes rare California plants into one of five lists (1A, 1B, 2, 3, and 4) representing five levels of species status, one of which is assigned to a sensitive species to indicate its status of rarity or endangerment and distribution. Most taxa also receive a threat code extension following the List (e.g. 1B.1, 2.3), which replaces the R-E-D Code previously used by CNPS. Table 8, California Native Plant Society Rare Plants List, provides a definition for each List code number, and Table 9, California Native Plant Society List Threat Code Extensions, defines the CNPS List Threat Code Extensions that indicates the level of endangerment within California.

The California Natural Diversity Database (CNDDDB) Element Ranking system provides a numeric global and state-ranking system for all special-status species tracked by the CNDDDB.

The global rank (G-rank) is a reflection of the overall condition of an element (species or natural community) throughout its global range. The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank. This Element Ranking system is defined below in Table 10, California Natural Diversity Database Element Ranking System.

Table 7. Definitions of Special-Status Species

<ul style="list-style-type: none"> ○ Plants and animals legally protected under the California and Federal Endangered Species Acts or under other regulations. 	
<ul style="list-style-type: none"> ○ Plants and animals considered sufficiently rare by the scientific community to qualify for such listing; or 	
<ul style="list-style-type: none"> ○ Plants and animals considered to be sensitive because they are unique, declining regionally or locally, or are at the extent of their natural range. 	
Special-Status Plant Species	Special-Status Animal Species
<ul style="list-style-type: none"> ○ Plants listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.12 for listed plants and various notices in <i>Federal Register</i> for proposed species). ○ Plants that are Category 1 or 2 candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (55 CFR 6184, February 21, 1990). ○ Plants that meet the definitions of rare or endangered species under the CEQA (<i>State CEQA Guidelines</i>, Section 15380). ○ Plants considered by CNPS to be "rare, threatened, or endangered" in California (Lists 1B and 2 in CNPS 2001). ○ Plants listed by CNPS as plants needing more information and plants of limited distribution (Lists 3 & 4 in CNPS 2001). ○ Plants listed by CNPS as locally rare (Lake 2004, Magney 2007a, Wilken 2003). ○ Plants listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 CCR 670.5). ○ Plants listed under the California Native Plant Protection Act (California Fish and Game Code 1900 et seq.). ○ Plants considered sensitive by other federal agencies (i.e. U.S. Forest Service, Bureau of Land Management) or state and local agencies or jurisdictions. ○ Plants considered sensitive or unique by the scientific community; occurs at natural range limits (<i>State CEQA Guidelines</i>, Appendix G). 	<ul style="list-style-type: none"> ○ Animals listed/proposed for listing as threatened/endangered under the Federal Endangered Species Act (50 CFR 17.11 for listed animals and various notices in <i>Federal Register</i> for proposed species). ○ Animals that are Category 1 or 2 candidates for possible future listing as threatened or endangered under Federal Endangered Species Act (54 CFR 554). ○ Animals that meet the definitions of rare or endangered species under the CEQA (<i>State CEQA Guidelines</i>, Section 15380). ○ Animals listed or proposed for listing by the State of California as threatened and endangered under the California Endangered Species Act (14 CCR 670.5). ○ Animal species of special concern (SSC) to the CDFG. ○ Animal species that are fully protected in California (California Fish & Game Code, Sections 3511 [birds], 4700 [mammals], 5050 [reptiles, amphibians]). ○ Animals considered rare or sensitive locally by a local agency or scientific community (<i>State CEQA Guidelines</i>, Appendix G)

Table 8. California Native Plant Society Rare Plants List (CNPS List)

CNPS List	Definition
1A	Presumed Extinct in California
1B	Rare, Threatened, or Endangered in California and elsewhere
2	Rare, Threatened, or Endangered in California, but more common elsewhere
3	Need more information (a Review List)
4	Plants of Limited Distribution (a Watch List)

Table 9. California Native Plant Society List Threat Code Extensions

CNPS Threat Code Extension	Definition
x.1	Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
x.2	Fairly endangered in California (20-80% occurrences threatened)
x.3	Not very endangered in California (<20% of occurrences threatened)

CNDDDB SEARCH RESULTS

The California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDDB) RareFind3 and GIS database (CDFG 2008) was searched in order to determine the potential special-status elements known to occur in the project region that may occur on the project site. Nine (9) California Quadrangles (USGS 7.5-minute Series Topographic Map) were queried for the CNDDDB RareFind3 records search. The Elk Grove Quadrangle, in which the project site occurs, was searched, as well as the eight surrounding quadrangles of Bruceville, Buffalo Creek, Carmichael, Clay, Florin, Galt, Sacramento East, and Sloughouse. Figure 6, Map of Special-Status Species and Sensitive Habitats of Project Region, illustrates the distribution of CNDDDB-listed plants, wildlife, and habitats in the vicinity of the project site. Figure 7, Map of Sensitive Biological Resources at the Project Site, shows the position of the NVG project site and the nine quads within the SSHCP study area.

DMEC also conducted a search of CNPS's *Inventory of Rare and Endangered Plants of California* (CNPS 2001, 2008) to account for CNPS-listed plants not tracked on the CNDDDB database with potential to occur in the vicinity of the proposed project site. The CNDDDB Special Animals List (CNDDDB 2007) and SSHCP Species Analysis Documents were also referenced to account for other sensitive animal species.

Table 10. California Natural Diversity Database Element Ranking System

Global Ranking (G)	
G1	Less than 6 viable element occurrences (pops for species), OR less than 1,000 individuals, OR <809.4 hectares (ha) (2,000 acres [ac]).
G2	6 to 20 element occurrences OR 809.4 to 4,047 ha (2,000 to 10,000 ac).
G3	21 to 100 element occurrences OR 3,000 to 10,000 individuals OR 4,047 to 20,235 ha (10,000 to 50,000 ac).
G4	Apparently secure; rank lower than G3, factors exist to cause some concern (i.e. there is some threat, or somewhat narrow habitat).
G5	Population, or stand, demonstrably secure to ineradicable due to being commonly found in the world.
GH	All sites are historic ; the element has not been seen for at least 20 years, but suitable habitat still exists.
GX	All sites are extirpated ; this element is extinct in the wild.
GXC	Extinct in the wild; exists in cultivation.
G1Q	The element is very rare, but there is a taxonomic question associated with it.
<p>Subspecies Level: Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire <u>species</u>, whereas the T-rank reflects the global situation of just the <u>subspecies</u> or <u>variety</u>. For example: <i>Chorizanthe robusta</i> var. <i>hartwegii</i> is ranked G2T1. The G-rank refers to the whole species range (<i>Chorizanthe robusta</i>), whereas the T-rank refers only to the global condition of the variety (var. <i>hartwegii</i>).</p>	
State Ranking (S)	
S1	Less than 6 element occurrences OR less than 1,000 individuals OR less than 809.4 ha (2,000 ac). S1.1 = very threatened S1.2 = threatened S1.3 = no current threats known
S2	6 to 20 element occurrences OR 3,000 individuals OR 809.4 to 4,047 ha (2,000 to 10,000 ac). S2.1 = very threatened S2.2 = threatened S2.3 = no current threats known..
S3	21 to 100 element occurrences OR 3,000 to 10,000 individuals OR 4,047 to 20,235 ha (10,000 to 50,000 ac). S3.1 = very threatened S3.2 = threatened S3.3 = no current threats known
S4	Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern (i.e. there is some threat, or somewhat narrow habitat). NO THREAT RANK.
S5	Demonstrably secure to ineradicable in California. NO THREAT RANK.
SH	All California sites are historic ; the element has not been seen for at least 20 years, but suitable habitat still exists.
SX	All California sites are extirpated ; this element is extinct in the wild.
Notes	
<p>1. Other considerations used when ranking a species or natural community include the pattern of distribution of the element on the landscape, fragmentation of the population/stands, and historical extent as compared to its modern range. It is important to take an aerial view when ranking sensitive elements rather than simply counting element occurrences.</p>	
<p>2. Uncertainty about the rank of an element is expressed in two major ways: by expressing the rank as a range of values (e.g. S2S3 means the rank is somewhere between S2 and S3), and by adding a ? to the rank (e.g. S2?). This represents more certainty than S2S3, but less than S2.</p>	

Figure 6. Map of Special-Status Species and Sensitive Habitats of Project Region

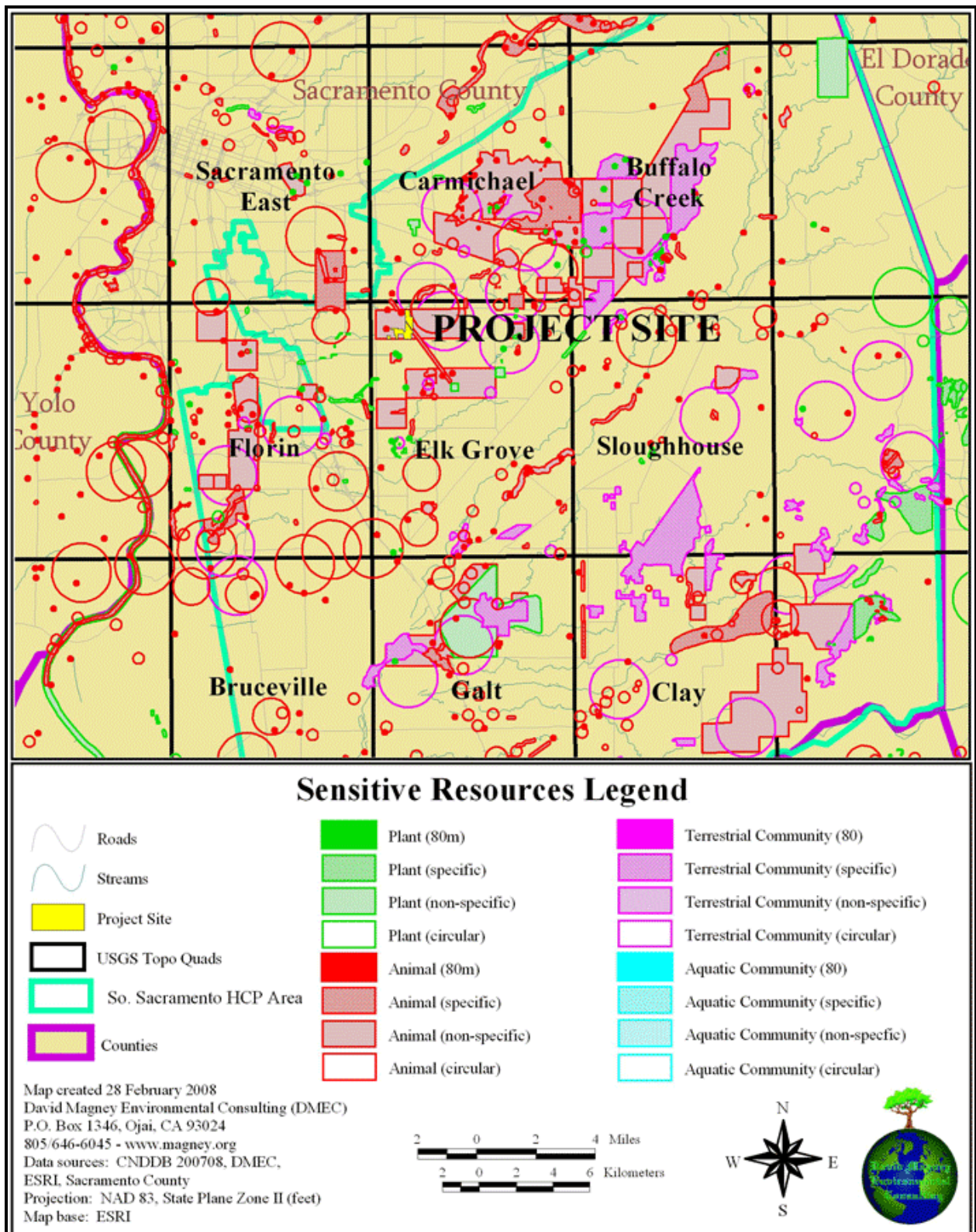
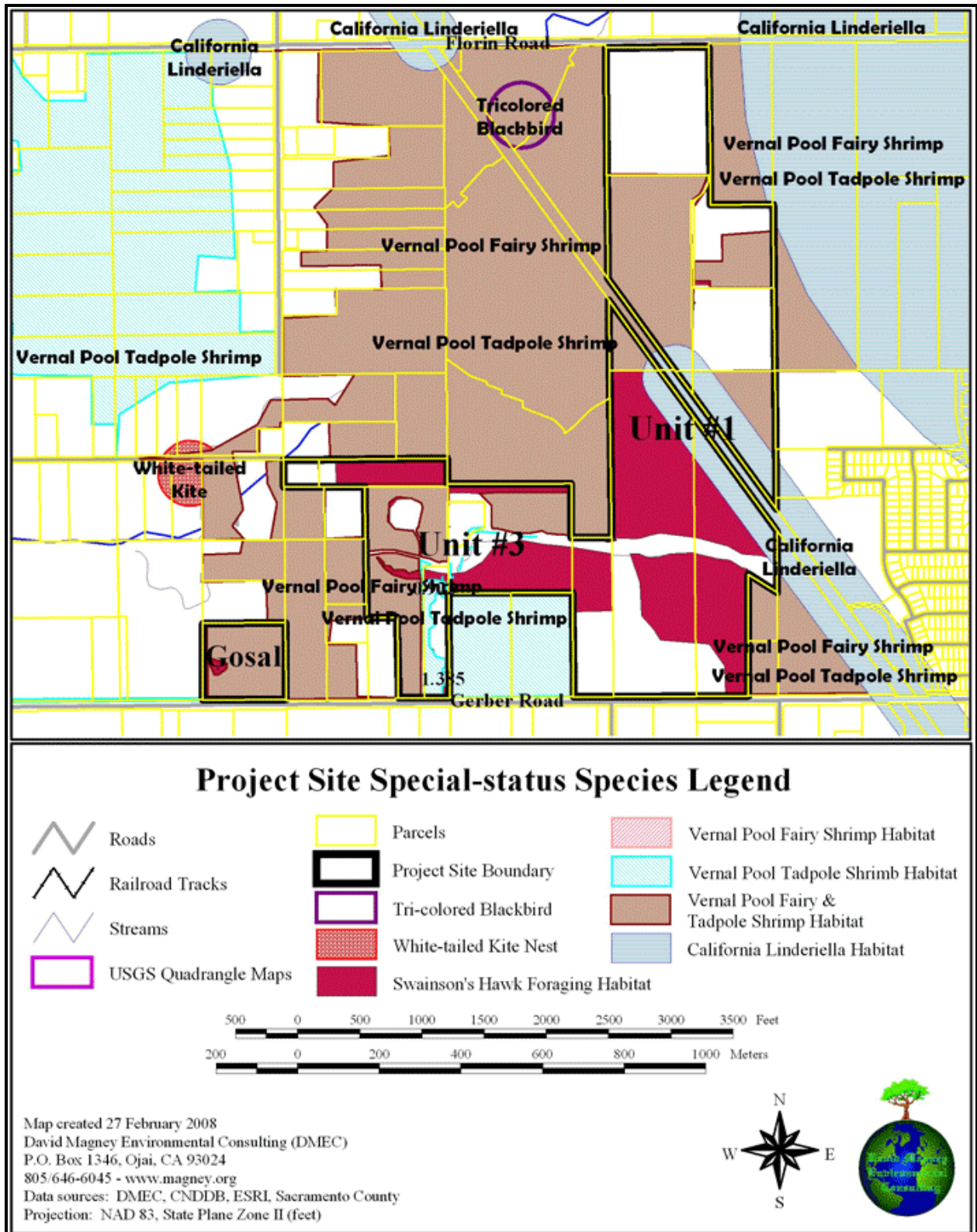


Figure 7. Map of Sensitive Biological Resources at the Project Site



Special-Status Plants

A total of thirteen (13) special-status plant species tracked by CNDDDB are known or reported in the vicinity of the project site and have the potential to occur onsite. Table 11, Special-Status Plants Potentially Occurring Onsite, summarizes the CNDDDB reports for the 13 special-status plant species tracked for the nine quads, and provides each species' scientific and common names, status, habitat requirements, and likelihood of occurrence. Five (5) of these plants are reported by CNDDDB in the vicinity of the NVG project site but are not expected to occur there because the habitat present onsite is not of sufficient quality to support these species. CNPS's *Inventory of Rare and Endangered Plants of California* lists nine (9) additional vascular plants potentially occurring onsite that are shown in Table 12, Additional CNPS-Listed Plants Potentially Occurring Onsite. None of the twenty-two (22) plant species listed in Tables 11 and 12 have been reported or observed onsite.

Table 11. Special-Status Plants Potentially Occurring Onsite

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence ¹¹
		G-Rank ¹²	S-Rank	Fed	CA	CNPS		
<i>Carex comosa</i>	Bristly Sedge	G5	S2?	-	-	2.1	Marshes and swamps. Lake margins, wet places; site below sea level is on a Delta island. -5-1,005m.	Possible [HP]
<i>Downingia pusilla</i>	Dwarf Downingia	G3	S3.1	-	-	2.2	Valley and foothill grassland (mesic sites), vernal pools. Vernal lake and pool margins with a variety of associates. In several types of vernal pools. 1-485m.	Possible [HP]
<i>Gratiola heterosepala</i>	Boggs Lake Hedgehyssop	G3	S3.1	-	E	1B.2	Marshes and swamps (freshwater), vernal pools. Clay soils; usually in vernal pools, sometimes on lake margins. 5-2,400m.	Possible (reported in vicinity by CNDDDB) [HP]
<i>Hibiscus lasiocarpus</i>	Rose-Mallow	G4	S2.2	-	-	2.2	Marshes and swamps (freshwater). Moist, freshwater-soaked river banks & low peat islands in sloughs; in Calif., known from the Delta watershed. 0-150m.	Possible [HP], onsite habitat marginal at best
<i>Juglans hindsii</i>	Northern California Black Walnut	G1	S1.1	-	-	1B.1	Riparian forest, riparian woodland. Few extant native stands remain; widely naturalized. Deep alluvial soil associated with a creek or stream. 0-395m.	Possible [HP]

¹¹ Likelihood of occurrence based on species' habitat requirements and presence of required habitat onsite.
 Observed [P] = Species has been reported onsite [Present];
 Likely [HP] = Required habitat present onsite and the species has been reported in the vicinity [Habitat Present];
 Possible [HP] = Marginal habitat onsite and/or required habitat present nearby, with no reported occurrences nearby [Habitat Present];
 Unlikely [HA] = Required habitat not reported onsite, nor is it found nearby [Habitat Absent].

¹² See Tables 7 through 10 above for descriptions of rank and status categories. Federal (Fed) and State (CA) status listings: E = Endangered; T = Threatened; R = Rare; C = Candidate.

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence ¹¹
		G-Rank ¹²	S-Rank	Fed	CA	CNPS		
<i>Juncus leiospermus</i> var. <i>ahartii</i>	Ahart's Dwarf Rush	G2T1	S1.2	-	-	1B.2	Vernal pools. Restricted to the edges of vernal pools. 30-100m.	Possible [HP]
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta Tule Pea	G5T2	S2.2	-	-	1B.2	Freshwater and brackish marshes. Often found w/ <i>Typha</i> , <i>Aster lentus</i> , <i>Rosa californica</i> , <i>Juncus</i> spp., <i>Scirpus</i> , etc. Usually on marsh and slough edges.	Possible [HP], onsite habitat marginal at best
<i>Legenere limosa</i>	Legenere	G2	S2.2	-	-	1B.1	Vernal pools. Many historical occurrences are extirpated. In beds of vernal pools. 1-880m.	Possible (reported in vicinity by CNDDDB) [HP]
<i>Lilaeopsis masonii</i>	Mason's Lilaeopsis	G3	S3.1	-	R	1B.1	Freshwater and brackish marshes, riparian scrub. Tidal zones in muddy or silty soil formed by river deposition or river bank erosion. 0-10m.	Possible [HP]
<i>Orcuttia tenuis</i>	Slender Orcutt Grass	G3	S3.1	T	E	1B.1	Vernal pools. 30-1,735m. Onsite wetlands do not pond long enough.	Possible (reported in vicinity by CNDDDB) [HP]
<i>Orcuttia viscida</i>	Sacramento Orcutt Grass	G1	S1.1	E	E	1B.1	Vernal pools. 30-100m. Onsite wetlands do not pond long enough.	Possible [HP]
<i>Sagittaria sanfordii</i>	Sanford's Arrowhead	G3	S3.2	-	-	1B.2	Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0-610m.	Possible (reported in vicinity by CNDDDB) [HP]
<i>Scutellaria lateriflora</i>	Blue Skullcap	G5	S2S3	-	-	2.2	Meadows and seeps, marshes and swamps. Wet meadows and marshes. 3-500m.	Possible [HP]

Table 12. Additional CNPS-Listed Plants Potentially Occurring Onsite

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence
		G-Rank	S-Rank	Fed	CA	CNPS		
<i>Centromadia parryi</i> ssp. <i>rudis</i>	Parry's Red Tarplant	G4T3	S3.2	-	-	4.2	Valley and foothill grasslands, vernal pools. Alkaline, vernal mesic seeps; sometimes roadsides. 0-100m.	Possible [HP]
<i>Eryngium pinnatisectum</i>	Tuolumne Button-celery	G3	S3.2	-	-	1B.2	Vernal pools, cismontane woodland, lower montane coniferous forest. Volcanic soils; vernal pools and mesic sites within other natural communities. 250-450m.	Possible [HP]
<i>Fritillaria agrestis</i>	Stinkbells	G3	S3.2	-	-	4.2	Cismontane woodland, chaparral, valley and foothill grassland. Sometimes on serpentine; mostly found in nonnative grassland or in grassy openings in clay soil. 10-1555m.	Possible [HP]
<i>Hesperex caulescens</i>	Hogwallow Starfish	G3	S3.2	-	-	4.2	Valley and foothill grassland. Clay soils; mesic sites. 0-505m.	Possible [HP]

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence
		G-Rank	S-Rank	Fed	CA	CNPS		
<i>Lasthenia ferrisiae</i>	Ferris' Goldfields	G3	S3.2	-	-	4.2	Vernal pools. Alkaline, clay soils. 20-700m.	Possible [HP]
<i>Limosella subulata</i>	Delta Mudwort	G4?Q	S2.1	-	-	2.1	Riparian scrub, freshwater marsh, brackish marsh. Probably the rarest of the suite of Delta rare plants. Usually on mud banks of the Delta in marshy or scrubby riparian associations; often with <i>Lilaeopsis masonii</i> . 0-3m.	Possible [HP]
<i>Navarretia eriocephala</i>	Hoary Navarretia	G3	S3.3	-	-	4.3	Cismontane woodland, valley and foothill grassland. Vernal mesic sites. 105-400m.	Possible [HP]
<i>Navarretia myersii</i> ssp. <i>myersii</i>	Pincushion Navarretia	G1T1	S1.1	-	-	1B.1	Vernal pools, valley and foothill grassland. Clay soils within nonnative grassland. 20-330m.	Possible [HP]
<i>Ranunculus lobbii</i>	Lobb's Aquatic Buttercup	G4	S3.2	-	-	4.2	Cismontane woodland, valley and foothill grassland, vernal pools, North Coast coniferous forest. Mesic sites. 15-470m.	Possible [HP]

Special-Status Wildlife

A total of twenty-seven (27) special-status wildlife species tracked by CNDDDB are known or reported in the vicinity of the project site and have the potential to occur onsite. Table 13, Special-Status Wildlife Potentially Occurring Onsite, summarizes the CNDDDB reports for the 27 special-status wildlife species tracked for the nine quads, and provides each species' scientific and common names, status, habitat requirements, and likelihood of occurrence. Table 14, CNDDDB Special Animals List/SSHCP Species Potentially Occurring Onsite, lists fifteen (15) wildlife species from the CNDDDB Special Animals List that are identified as having potential to occur in the SSHCP study area. In addition to the species listed in Tables 13 and 14, it should be noted that all raptors, raptor nests (active or inactive), and other active bird nests are protected under Fish and Game Code Section 3503.

Several of the special-status wildlife species known to occur in the vicinity of the project require habitat consistent with the habitat types present onsite. No federally or state listed wildlife species have been specifically reported on the NVG site; however, five (5) of the 27 special-status wildlife species are mapped by CNDDDB as having occurrences on or in the immediate vicinity of the NVG site. These five species include two (2) species of birds (*Agelaius tricolor* and *Elanus leucurus*) and three (3) species of aquatic invertebrates (*Branchinecta lynchi* [federally listed as Threatened], *Lepidurus packardii* [federally listed as Endangered], and *Linderiella occidentalis*). CNDDDB indicates that habitat for the two federally listed invertebrates occurs in the area that includes the NVG project site and that they are present within this area. According to CNDDDB, *L. occidentalis* appears to be associated with seasonal wetlands along the Central California Traction Railroad right-of-way that transects the eastern portion of the project site but is not part of the project. ECORP (2007) reported the presence of *L. occidentalis* in a nonjurisdictional seasonal wetland onsite (Snj1 in Figure 5 above). The two birds have reported

occurrences just to the north and west of the project site. Figure 7 shows the position of the NVG project footprint relative to the five CNDDDB species' mapped occurrences.

Table 13. Special-Status Wildlife Potentially Occurring Onsite

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence ¹³
		G-Rank ¹⁴	S-Rank	Fed	CA	CDFG		
<i>AMPHIBIANS</i>								
<i>Ambystoma californiense</i>	California Tiger Salamander	G2G3	S2S3	T	-	SC	Central Valley DPS listed as threatened; Santa Barbara & Sonoma Counties DPS listed as endangered. Need underground refuges, especially ground squirrel burrows & vernal pools or other seasonal water sources for breeding	Possible [HP]
<i>Spea (=Scaphiopus) hammondi</i>	Western Spadefoot Toad	G3	S3	-	-	SC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg laying.	Possible [HP]
<i>REPTILES</i>								
<i>Actinemys (=Emys) marmorata</i> ssp. <i>marmorata</i>	Northwestern Pond Turtle	G3G4T3	S3	-	-	SC	Associated with permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nest sites may be found up to 0.5 km from water.	Unlikely [HA]
<i>Thamnophis gigas</i>	Giant Garter Snake	G2G3	S2S3	T	T	-	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals & irrigation ditches. This is the most aquatic of the garter snakes in California.	Possible [HP]
<i>BIRDS</i>								
<i>Accipiter cooperi</i>	Cooper's Hawk	G5	S3	-	-	SC	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river floodplains; also, live oaks.	Likely (foraging) [HP]
<i>Agelaius tricolor</i>	Tricolored Blackbird	G2G3	S2	-	-	SC	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, & foraging area with insect prey within a few km of the colony.	Very likely (reported in immediate vicinity by CNDDDB) [HP]

¹³ Likelihood of occurrence based on species' habitat requirements and presence of required habitat onsite.

Observed [P] = Species has been observed onsite [Present];

Likely [HP] = Required habitat present onsite and the species has been reported in the vicinity [Habitat Present];

Possible [HP] = Marginal habitat onsite and/or required habitat present nearby, with no reported occurrences nearby [Habitat Present];

Unlikely [HA] = Required habitat not reported onsite, nor is it found nearby [Habitat Absent].

¹⁴ See Tables 7 through 10 above for descriptions of rank and status categories. Federal (Fed) and State (CA) status listings:

E = Endangered; T = Threatened; R = Rare; C = Candidate; FP = Fully Protected.

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence ¹³
		G-Rank ¹⁴	S-Rank	Fed	CA	CDFG		
<i>Ardea alba</i>	Great Egret	G5	S4	-	-	-	Colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	Likely (foraging) [HP]
<i>Ardea herodias</i>	Great Blue Heron	G5	S4	-	-	-	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	Likely (foraging) [HP]
<i>Athene cunicularia</i>	Burrowing Owl	G4	S2	-	-	SC	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the CA Ground Squirrel.	Possible (reported in vicinity by CNDDDB) [HP]
<i>Buteo regalis</i>	Ferruginous Hawk	G4	S3S4	-	-	SC	Open grasslands, sagebrush flats, desert scrub, low foothills & fringes of Pinyon-Juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Possible (reported in vicinity by CNDDDB) [HP]
<i>Buteo swainsoni</i>	Swainson's Hawk	G5	S2	-	T	-	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch sites. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Likely (foraging) [HP]
<i>Elanus leucurus</i>	White-tailed Kite	G5	S3	-	-	FP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Very likely (reported in immediate vicinity by CNDDDB) [HP]
<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	G5	S3	-	-	-	Colonial nester, usually in trees, occasionally in tule patches. Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	Possible [HP]
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	G5	S3	-	-	SC	Colonial nester on coastal cliffs, offshore islands, & along lake margins in the interior of the state. Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.	Unlikely [HA]
<i>Progne subis</i>	Purple Martin	G5	S3	-	-	SC	Inhabits woodlands, low elevation coniferous forest of Douglas-fir, Ponderosa Pine, & Monterey Pine. Nests in old woodpecker cavities mostly, also in human-made structures. Nest often located in tall, isolated tree/snag.	Possible [HP]

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence ¹³
		G-Rank ¹⁴	S-Rank	Fed	CA	CDFG		
<i>Riparia riparia</i>	Bank Swallow	G5	S2S3	-	T	-	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, or ocean to dig nesting holes.	Unlikely [HA]
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird	G5	S3S4	-	-	-	Nests in freshwater emergent wetlands with dense vegetation & deep water. Often along borders of lakes or ponds. Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.	Unlikely [HA]
MAMMALS								
<i>Taxidea taxus</i>	American Badger	G5	S4	-	-	SC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need sufficient food, friable soils & open, uncultivated ground. Prey on burrowing rodents. Dig burrows.	Possible (reported in vicinity by CNDDDB) [HP]
FISH								
<i>Pogonichthys macrolepidotus</i>	Sacramento Splittail	G2	S2	-	-	SC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay, & associated marshes. Slow moving river sections, dead end sloughs. Require flooded vegetation for spawning & foraging for young.	Unlikely [HA]
INVERTEBRATES								
<i>Andrena blennospermatis</i>	A vernal pool Andrenid bee	G2	S2	-	-	-	This bee is oligolectic on vernal pool <i>Blennosperma</i> . Bees nest in the uplands around vernal pools.	Possible [HP]
<i>Branchinecta lynchi</i>	Vernal Pool Fairy Shrimp	G3	S2S3	T	-	-	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mtns., in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	Present (reported by CNDDDB on NVG site) [P]
<i>Branchinecta mesovallensis</i>	Midvalley Fairy Shrimp	G2	S2	-	-	-	Vernal pools in the Central Valley.	Possible [HP]
<i>Desmocerus californicus dimorphus</i>	Valley Elderberry Longhorn Beetle	G3T2	S2	T	-	-	Occurs only in the Central Valley of California, in association with Blue Elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	Possible [HP]
<i>Dumontia oregonensis</i>	A water flea	G1G3	S1	-	-	-	Vernal pools. In California, known only from Mather Field.	Unlikely [HA]
<i>Hydrochara rickseckeri</i>	Ricksecker's Water Scavenger Beetle	G1G2	S1S2	-	-	-	Aquatic, vernal pools and seasonal wetlands. Larvae are predatory, adults are omnivorous.	Possible [HP]

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence ¹³
		G-Rank ¹⁴	S-Rank	Fed	CA	CDFG		
<i>Lepidurus packardi</i>	Vernal Pool Tadpole Shrimp	G3	S2S3	E	-	-	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.	Present (reported by CNDDDB on NVG site) [P]
<i>Linderiella occidentalis</i>	California Linderiella	G3	S2S3	-	-	-	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and TDS.	Present (reported by ECORP on NVG site) [P]

Table 14. CNDDDB Special Animals List/SSHCP Species Potentially Occurring Onsite

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence
		G-Rank	S-Rank	Fed	CA	CDFG		
<i>BIRDS</i>								
<i>Accipiter striatus</i>	Sharp-shinned Hawk	G5	S3	-	-	SC	Ponderosa pine, black oak, riparian deciduous, mixed conifer & Jeffrey pine habitats. Prefers riparian areas. North-facing slopes, with plucking perches are critical requirements. Nests usually within 275 ft of water.	Possible [HP]
<i>Aquila chrysaetos</i>	Golden Eagle	G5	S3	-	-	FP/SC	Rolling foothills, mountain areas, sage-juniper flats, & desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Possible [HP]
<i>Asio flammeus</i>	Short-eared Owl	G5	S3	-	-	SC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	Possible [HP]
<i>Asio otus</i>	Long-eared Owl	G5	S3	-	-	SC	Riparian bottomlands grown to tall willows & cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	Possible [HP]
<i>Circus cyaneus</i>	Northern Harrier	G5	S3	-	-	SC	Coastal salt & fresh-water marsh. Nest & forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	Possible [HP]
<i>Falco columbarius</i>	Merlin	G5	S3	-	-	SC	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands & deserts, farms & ranches. Clumps of trees or windbreaks are required for roosting in open country.	Possible [HP]

Scientific Name	Common Name	Species Status					Habitat Requirements	Likelihood of Occurrence
		G-Rank	S-Rank	Fed	CA	CDFG		
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	G4T3	S2	-	E	FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape on a depression or ledge in an open site.	Possible [HP]
<i>Grus canadensis tabida</i>	Greater Sandhill Crane	G5T4	S2	-	T	FP	Nests in wetland habitats in Northeastern California; winters in the Central Valley. Prefers grain fields within 4 mi of a shallow body of water used as a communal roost site; irrigated pasture may be used.	Possible [HP]
<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S2	-	E	FP	Ocean shore, lake margins, & rivers for both nesting & wintering. Most nests within 1 mi of water. Nests in large, old-growth, or dominant live tree w/open branches, especially ponderosa pine. Roosts communally in winter.	Possible [HP]
<i>Icteria virens</i>	Yellow-breasted Chat	G5	S3	-	-	SC	Summer resident; inhabits riparian thickets of willow & other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft of ground.	Possible [HP]
<i>Lanius ludovicianus</i>	Loggerhead Shrike	G4	S4	-	-	SC	Broken woodlands, savannah, Pinyon-Juniper, Joshua Tree, & riparian woodlands, desert oases, scrub & washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Possible [HP]
<i>Plegadis chihi</i>	White-faced Ibis	G5	S1	-	-	SC	Shallow fresh-water marsh. Dense tule thickets for nesting interspersed with areas of shallow water for foraging.	Possible [HP]
MAMMALS								
<i>Antrozous pallidus</i>	Pallid Bat	G5	S3	-	-	SC	Deserts, grasslands, shrublands, woodlands & 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 [HP]
<i>Lasirus blossevilli</i>	Western Red Bat	G5	S3?	-	-	SC	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat edges & mosaics with trees that are protected from above & open below with open areas for foraging.	Possible [HP]
<i>Myotis yumanensis</i>	Yuma Myotis Bat	G5	S4?	-	-	-	Optimal habitats are open forests and woodlands with sources of water over which to feed. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings or crevices.	Possible [HP]

Special-Status Habitats

Special-status habitat types include plant communities that are threatened by urbanization and are continually influenced by human activities. Table 15, CNDDDB Special-Status Habitats Potentially Occurring Onsite, lists the six (6) sensitive habitat types tracked by CNDDDB that occur onsite or nearby. These habitats are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. These resources have been defined by Federal, State, and local government conservation programs as sensitive.

Of the six sensitive habitat types known in the vicinity of the project site, only Northern Hardpan Vernal Pool (3 small pools) was observed onsite. However, it should be noted that no soil survey was conducted in this habitat to definitively determine whether the vernal pool habitat observed onsite is Northern Hardpan specifically. Regardless, the vernal pool habitat onsite is at least marginal quality Northern Hardpan Vernal Pool. The freshwater marsh onsite is seasonal and not permanently flooded as indicated for Coastal and Freshwater Marsh.

Table 15. CNDDDB Special-Status Habitats Potentially Occurring Onsite

CNDDDB Sensitive Habitats (Holland 1986, CDFG 2003)	G Rank ¹⁵	S Rank	Fed	CA	Presence Onsite ¹⁶
Coastal and Valley Freshwater Marsh	G3	S2.1	-	-	Observed [P] , small area in Unit #1 W & S of RR tracks
Elderberry Savanna	G2	S2.1	-	-	Not observed
Great Valley Mixed Riparian Forest	G2	S2.2	-	-	Not observed
Great Valley Oak Riparian Forest	G1	S1.1	-	-	Not observed
Northern Hardpan Vernal Pool	G3	S3.1	-	-	Observed [P] (reported by CNDDDB in immediate vicinity)
Valley Oak Woodland	G3	S2.1	-	-	Not observed

¹⁵ See Tables 7 through 10 above for descriptions of rank and status categories. Federal (Fed or F) and State (CA or S) status listings: E = Endangered; T = Threatened; R = Rare; C = Candidate; SC = Species of Concern.

¹⁶ Observed [P] = Habitat present onsite [Present]; Not Observed = Habitat not present onsite though some constituents of the habitat may be present as noted; [CH] = Project footprint is within a Critical Habitat unit.

SECTION V. ALTERNATIVES ANALYSIS

The Alternatives Analysis (DMEC 2007a) evaluated the practicability of project alternatives and provided the Corps with documentation to be used in evaluating the proposed project permit application in compliance with 404(b)(1) guidelines.

The project, as proposed, would result in the discharge of dredged and fill material into 1.60 acres of waters of the U.S., including wetlands. In addition to requiring the identification of the least environmentally damaging practicable alternative (LEDPA), guidelines mandate that a project must not violate any applicable toxic effluent standard or prohibition, jeopardize the continued existence of any endangered or threatened species (or destroy or adversely modify critical habitat), or cause or contribute to significant degradation of waters of the U.S.

PROPOSED PROJECT ALTERNATIVES

Six project alternatives were proposed to provide the required range of alternatives. The LEDPA was identified through an analysis of the proposed alternatives summarized below.

Alternative 1 (No Project) does not impact the NVG site, nor does it provide housing or meet project objectives. Does not meet guidelines as LEDPA.

Alternative 2 (Alternate Site) does not impact the NVG site, has unknown potential impacts on alternate sites, and project objectives cannot be met because no suitable alternate sites are currently available. Does not meet guidelines as LEDPA.

Alternative 3 (Total Avoidance) significantly impacts avoided jurisdictional wetlands due to isolation and urban edge effects, provides less housing with significantly higher per-acre project development costs, and does not fully meet project objectives. Does not meet guidelines as LEDPA.

Alternative 4 (Partial Avoidance) impacts avoided wetlands, minimally restores wetland function onsite with mitigation, increases per-acre project costs, and partially meets project objectives. Does not meet guidelines as LEDPA.

Alternative 5 (Project with Onsite Mitigation) restores contiguous wetland ecosystem function onsite and meets project objectives. Meets guidelines as LEDPA.

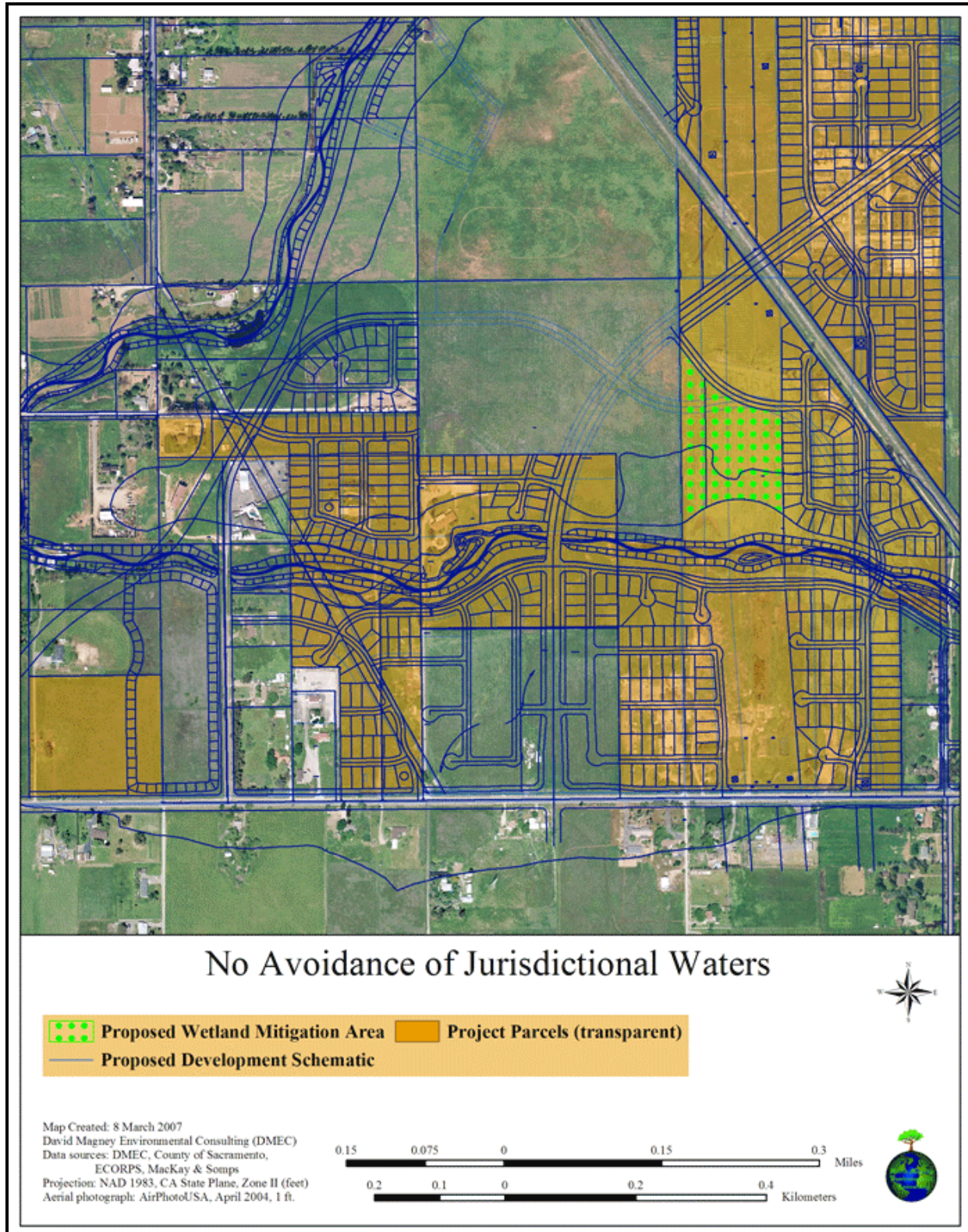
Alternative 6 (Project with Offsite Mitigation) eliminates wetland function onsite, preserves wetland function at offsite locations, and meets project objectives. Does not meet guidelines as LEDPA.

LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE

The preferred alternative, Proposed Project with Onsite Mitigation (Alternative 5), represents a balanced approach that allows the NVG development project to meet the environmental, project purpose, logistics, availability, and cost evaluation criteria. Avoiding direct impacts to onsite wetlands is considered generally infeasible since the wetlands are scattered across the NVG project site in different areas and would result in the loss of both wetland function and dwelling units if the project were to be reconfigured.

The Proposed Project with Onsite Mitigation Alternative restores contiguous wetland ecosystem functions onsite and fully meets project objectives. Because the onsite mitigation provides the opportunity for connectivity among created wetlands and with Gerber Creek, the environmental effects appear to be low. Because this alternative is also highly practicable it meets guidelines as LEDPA. The LEDPA is represented in Figure 8, Proposed Project with Onsite Mitigation Alternative.

Figure 8. Proposed Project with Onsite Mitigation Alternative



SECTION VI. MITIGATION PLAN

This section summarizes the mitigation plan presented in the Wetland Mitigation and Monitoring Plan (DMEC 2007b).

REGULATORY CONTEXT

The mitigation plan was prepared to meet regulatory requirements under Sections 401 and 404 of the Clean Water Act. to mitigate for impacts to waters of the U.S., including wetlands, incurred as a result of the NVG development project. As indicated in the Alternatives Analysis (DMEC 2007a), the avoidance of wetlands with preservation and restoration of wetland functions in place on the NVG site was not found to be practicable. Instead, onsite mitigation through the creation of a wetland preserve was determined to be the superior alternative.

County of Sacramento Mitigation Measures

The County of Sacramento, through its environmental impact assessment of project-related impacts to biological and cultural resources, imposed specific measures to mitigate impacts that were considered significant pursuant to CEQA Guidelines (County of Sacramento 2005). The pertinent County mitigation measures are summarized below:

- **BR-2:** The project applicant shall obtain all applicable jurisdictional wetlands permits from the Corps and shall compensate the County of Sacramento for any loss of jurisdictional wetlands.
- **BR-3:** Areas within 200 feet of all jurisdictional wetlands shall be surveyed by a qualified biologist prior to construction, and permits shall be obtained for the take of any protected species.
- **BR-4:** Prior to construction, determinate-level special-status wetland invertebrate species surveys shall be conducted during the appropriate season(s) by a qualified biologist.
- **BR-5:** The project site shall be surveyed for special-status reptiles by a qualified biologist within 24 hours prior to the start of construction activities within 200 feet of all jurisdictional wetlands.
- **CR-1:** Should any cultural resources be encountered during any development activities, work shall be suspended and the County shall be immediately notified.

OBJECTIVES

Wetland ecosystems that will be impacted as a result of project implementation are proposed to be recreated onsite and in-kind. The overall mitigation objective is to have no net loss of wetland extent or function resulting from project implementation. In addition, it is proposed that non-wetland areas of the mitigation site be restored as grassland with emphasis on the establishment of native species, particularly in the areas immediately surrounding the wetlands.

This project targets the restoration and enhancement of wetland ecosystem functions through the creation of geomorphic and biological attributes and processes on the NVG project site. Specifically, this project will restore natural wetland morphology and native plant communities in the mitigation area, expected to result in the overall enhancement of ecosystem functions on the project site.

GENERAL APPROACH

The approach presented herein proposes to recreate and enhance the physical, chemical, and biological attributes and processes of the impacted waters of the U.S., including wetlands, on the NVG project site. The overall area of waters/wetlands will be increased, overall ecosystem function is expected to be enhanced by allowing connectivity among created wetlands and with Gerber Creek, and revegetation will result in a more appropriate assemblage of native plants associated with the wetlands.

Emphasis will be on utilizing naturally occurring physical and biological features of the NVG site. Specific locations within the mitigation site that have suitable wetland soil characteristics will be identified and used for creating the wetlands. Many native, locally adapted plant species exist onsite that can be salvaged and/or propagated for use in vegetating the mitigation site.

Each created wetland will be planted at appropriate densities with suitable indigenous plants commonly associated with each wetland type. The remaining upland areas are proposed to be restored as grassland, with emphasis on using suitable indigenous plants. Additional native plants needed for revegetation of the mitigation site that cannot be derived from the NVG site will be obtained from other geographically appropriate sources.

CONSTRAINTS

Considerable controversy exists regarding the ability to successfully create or restore vernal pool ecosystems and the appropriateness of using habitat creation and restoration for mitigating impacts to vernal pools. Many creation efforts have proven successful, while others have failed to meet the desired level of wetland function. Successful creation and restoration require clearly defined goals and conducting detailed geomorphic, topographic, and soils analyses as the dominant factors in design. The full range of variability in physical parameters (e.g. depth and size of pools) and ecological diversity in natural pool complexes should be considered as the primary design goal for creation (DeWeese 1998, Sutter and Francisco 1998).

MITIGATION DESIGN

This section discusses the methods used to design the physical and biological features of the mitigation plan.

Site Suitability

DMEC evaluated the proposed mitigation site for suitability and consulted with the Corps and wetland and vernal pool creation experts (i.e. Joel Butterworth, Matt Gause, Mark C. Rains) to augment DMEC's own experience and expertise. Soil profiles on the approximate 4.2-acre mitigation site were evaluated for their wetland creation suitability in May of 2007 (Valley Environmental Consulting 2007).

The data gathered from the soil pits excavated onsite include:

- Thickness of topsoil present;
- Depth to the upper restrictive layer (Bt horizon);
- Thickness of the upper restrictive layer (Bt horizon); and
- Depth to the lower restrictive horizon (Bqm).

The entire mitigation area is located on San Joaquin silt loam, leveled, 0-1 percent slopes. The moderately permeable silt loam has a depth of approximately 23 inches where it has not been disturbed by leveling. A very slowly permeable clay or clay loam claypan (Bt horizon) exists at a depth range of approximately 23 to 28 inches, and in some profiles the claypan is absent. Beneath the claypan is a very slowly permeable iron-silica cemented duripan (Bqm horizon), which ranges in thickness from 12 to 72 inches. Both the Bt and Bqm horizons are considered restrictive layers with respect to wetlands. Fifteen (15) of the seventeen (17) soil profiles evaluated within the mitigation site were found to be suitable for wetland creation, subject to excavation or filling to create optimal conditions (see Figure 9 below).

Wetland Mitigation Design

Wetland ecosystem function will be restored by the following measures: (1) creating approximately 1.75 acres of wetlands onsite, including 0.30 acre of vernal pool wetland, 0.52 acre of seasonal wetland, 0.01 acre of seasonal wetland swale, and 0.92 acre of seasonal marsh; (2) establishing functional wetland hydrology; (3) eradicating nonnative plants in the mitigation area; and (4) revegetating the created wetlands with appropriate native plant assemblages. The proposed mitigation ratios and acreages for each wetland type are presented in Table 16, Proposed Wetland Mitigation Ratios and Acreages.

Seven (7) vernal pools are proposed for the mitigation site and will be excavated to a depth of approximately 12 to 14 inches, with approximately 3 to 4 inches of soil remaining above the claypan/duripan layer. The existing seasonal wetlands onsite tend to be shallow and excavation of the created seasonal wetlands will be to a depth of approximately 12 inches or less. The seasonal marsh will be excavated to a depth of approximately 25 inches. Seasonal swales will be excavated to a minimal depth that will allow hydrologic connectivity between adjacent wetlands and with Gerber Creek to the south. There will be many transitional areas between wetlands and adjacent uplands that will add to the mitigation site's geomorphic complexity. Figure 9, Proposed NVG Wetland Mitigation Design, illustrates the general locations of each wetland type proposed for the mitigation site.

Figure 9. Proposed NVG Wetland Mitigation Design

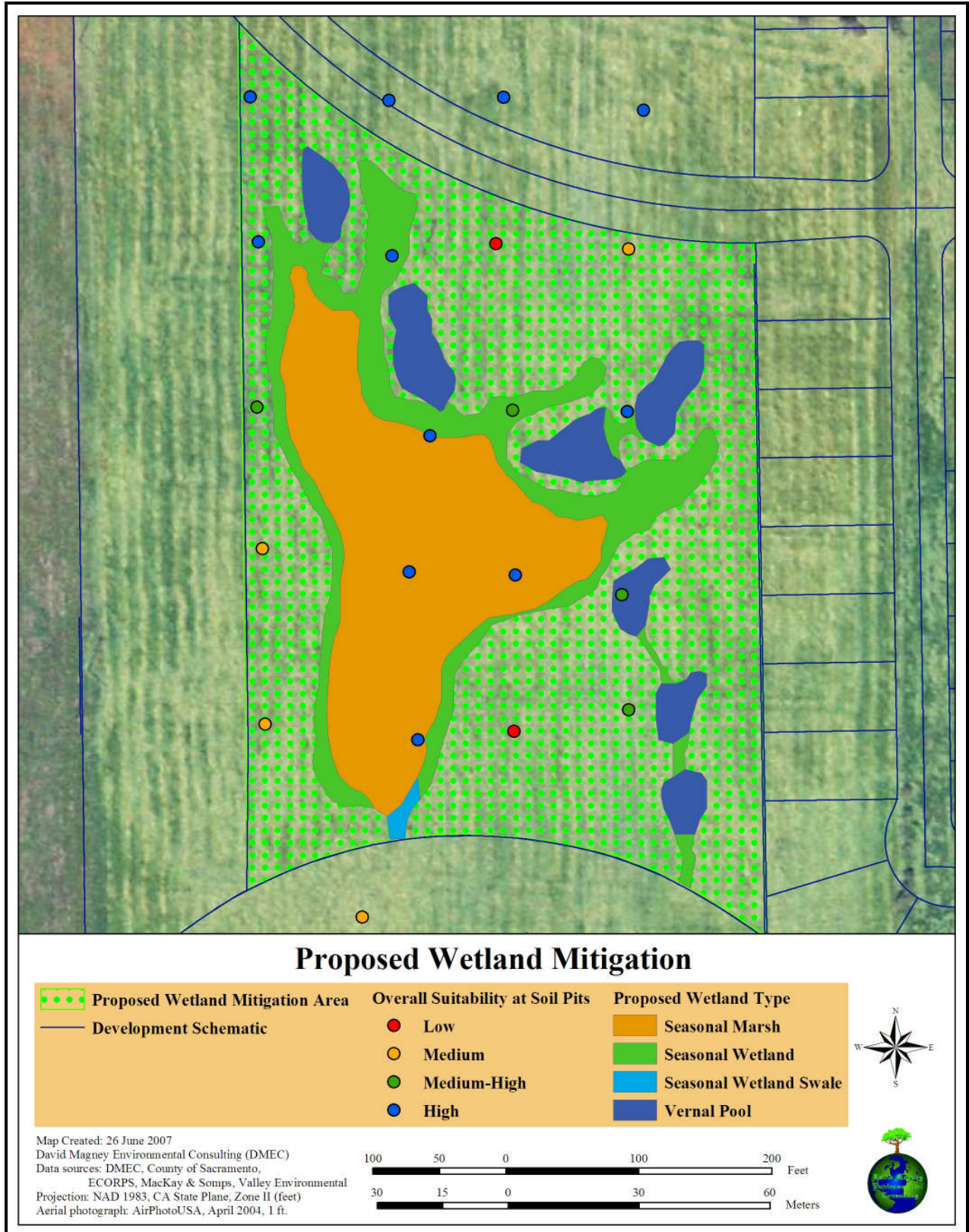


Table 16. Proposed Wetland Mitigation Ratios and Acreages

Wetland Type	Number of Existing Wetlands	Impacted Area (Acres)	Mitigation Ratio	Mitigation Area (Acres)
Vernal Pool	3	0.15	2:1	0.30
Seasonal Wetland	11	0.52	1:1	0.52
Seasonal Wetland Swale	1	0.01	1:1	0.01
Seasonal Marsh	1	0.92	1:1	0.92
Total	16	1.60	1.1:1¹⁷	1.75

Restoration of Mitigation Site Uplands

In addition to the creation of the wetlands, DMEC proposes that the remaining approximately 2.4 acres of upland on the mitigation site be restored as grassland that includes a diversity of native grasses and forbs. It will be attempted to establish suitable native species in upland areas to the extent practicable, especially in the wetland buffers. The vegetation in the buffers surrounding the wetlands is closely associated with wetland vegetation, and high populations of exotic plants in the uplands may have a negative impact on overall ecosystem function and mitigation success. Though not directly included in the regulatory mitigation requirements, restoration of the upland areas will enhance wetland mitigation efforts as well as improve the overall habitat value of the mitigation site. Many species of wildlife that occur in the area utilize or depend on grassland for cover and foraging.

Vernal pool specialist bees of the family Andrenidae are often the pollinators that most frequently visit the flowers of their preferred hosts. Among the vernal pool plants on the NVG site, the two *Lasthenia* species are pollinated by several species of specialist Andrenid bees. Many non-specialist pollinators, including other bees and members of several other insect groups, also visit *Lasthenia*. Andrenid bees, often the most important *Lasthenia* pollinators, build shallow nests in upland soils near host plant populations. Upland habitats support both specialist and non-specialist pollinators of vernal pool plants and are an important consideration when creating vernal pools (Thorp and Leong 1998).

Plant Palettes

The wetland areas resulting after hydrology assessment and grading are completed will be planted at varying densities with suitable indigenous wetland species. Since the wetland types to be created onsite have varying hydrology, soil moisture, and soil depth characteristics, plants specific for each wetland type have been recommended. Native grasses and forbs for the

¹⁷ Ratio of total area created (1.75 ac) to total area impacted (1.60 ac).

approximately 2.4 acres of uplands to be restored as grassland have also been recommended (DMEC 2007b). The mitigation areas will be planted with a combination of seed and vegetative material of plant species with local provenance so that the genetic integrity of the local habitat is preserved in the restored wetland ecosystem. The proposed mitigation site plant palettes are attached as Appendix B.

SECTION VII. IMPACTS ASSESSMENT

COUNTY OF SACRAMENTO IMPACT ASSESSMENT

The County of Sacramento prepared an EIR for the North Vineyard Station Specific Plan Area, which was approved in 1998 (County of Sacramento 1998). Subsequently, the County prepared a Supplemental EIR for the NVG project (County of Sacramento 2005), and imposed specific measures to protect or mitigate for significant adverse impacts to biological and cultural resources. These impacts are summarized below, and the County mitigation measures specifically pertaining to this wetland mitigation and monitoring plan are summarized under Section 4, Mitigation Plan.

Impacts To Biological Resources: Potentially Significant

The proposed project is expected to result in the loss of jurisdictional wetlands, potentially impact special-status species, and result in the loss of native oak and black walnut trees. Special-status species potentially impacted include plants, wetland invertebrate species, and vertebrate species, including: Giant Garter Snake (*Thamnophis gigas*), Northwestern Pond Turtle (*Emys marmorata* ssp. *marmorata*), and Swainson's Hawk (*Buteo swainsoni*). Mitigation is recommended to reduce the potential impacts of the project to less than significant.

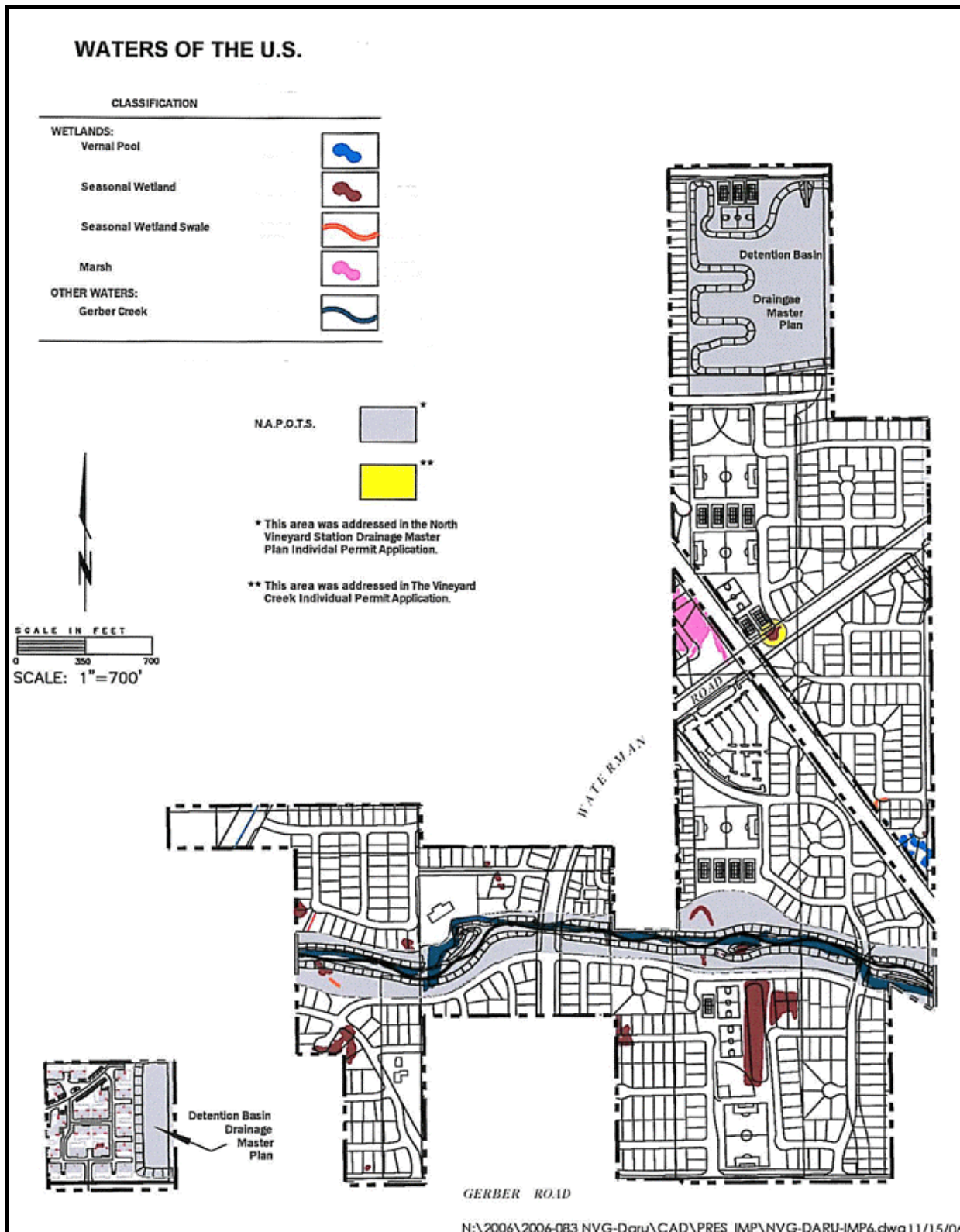
Impacts To Cultural Resources: Potentially Significant

The project is not expected to impact cultural resources. However, mitigation is recommended in the event that cultural resources are found during project construction. With mitigation as recommended, impacts to cultural resources are expected to be less than significant.

IMPACTS TO WATERS OF THE U.S., INCLUDING WETLANDS

A total of 1.60 acres of jurisdictional waters of the U.S., including wetlands, have been delineated on the NVG project site, and project implementation would result in direct impacts to (loss of) all 1.60 acres. Figure 10, Proposed Development Plan and Impacted Wetlands, shows the proposed NVG development in relation to the existing jurisdictional waters and wetlands of the U.S. 1.75 acres of wetlands are to be created onsite as mitigation, including 0.30 acre of vernal pool wetland, 0.52 acre of seasonal wetland, 0.01 acre of seasonal wetland swale, and 0.92 acre of seasonal marsh as described in Section VI above.

Figure 10. Proposed Development Plan and Impacted Wetlands



Note: This figure was adapted from Figure 7 in the 404 IP application prepared by ECORP Consulting, Inc. (2006).

Northern Hardpan Vernal Pool

One (1) special-status wetland habitat occurring on the NVG site, Northern Hardpan Vernal Pool, will be impacted as a result of project implementation. The impacts to vernal pools are discussed below.

CNDDDB OCCURRENCE INFORMATION (Occurrence No. 89, Updated 15 July 1998)

Presumed extant. East and west of Bradshaw Road, north of Gerber Road about 5 miles north of Elk Grove. East of Bradshaw Road sparse vernal pools extend for over 1 mile. West of Bradshaw Road is a smaller pool area on east side of Central California Traction Railroad line. Unable to convert to floristic classification, lacks species information.

Holland, R.F., and V. Dains. Vernal Pool Habitat of Sacramento County: 1949 and 1983 Compared. 1986.

OTHER OCCURRENCE INFORMATION

Reported by ECORP (2004a) in jurisdictional wetland delineation of NVG Unit 1 and observed onsite by DMEC. Three (3) shallow pools totaling 0.15 acre identified as V1, V2, and V3 in Figure 5 above.

DIRECT IMPACTS FROM PROJECT

All 3 vernal pools (0.15 acre) will be filled and the area will become part of the development.

INDIRECT IMPACTS FROM PROJECT

This resource will not be available for plants and wildlife until the vernal pools have been reestablished on the mitigation site. Onsite wetland functionality will be temporarily reduced.

CUMULATIVE EFFECTS

No cumulative negative impacts are expected. The establishment of seven (7) vernal pools totaling 0.30 acre on the mitigation site is expected to increase the vernal pool functionality onsite and will double the vernal pool area.

AVOIDANCE AND IMPACT MINIMIZATION MEASURES

There will be no avoidance of the vernal pools, though working in the dry season will minimize impacts to plants and wildlife associated with the vernal pools. Prior to and during construction activities, surveys for plants and wildlife shall be conducted as needed by a qualified biologist and any desirable plants shall be salvaged and all wildlife species relocated before construction proceeds.

IMPACTS TO BIOLOGICAL RESOURCES

The proposed development of the project site will result in impacts to biological resources. Impacts to vegetation and habitats and to wildlife are discussed below.

Vegetation and Habitats

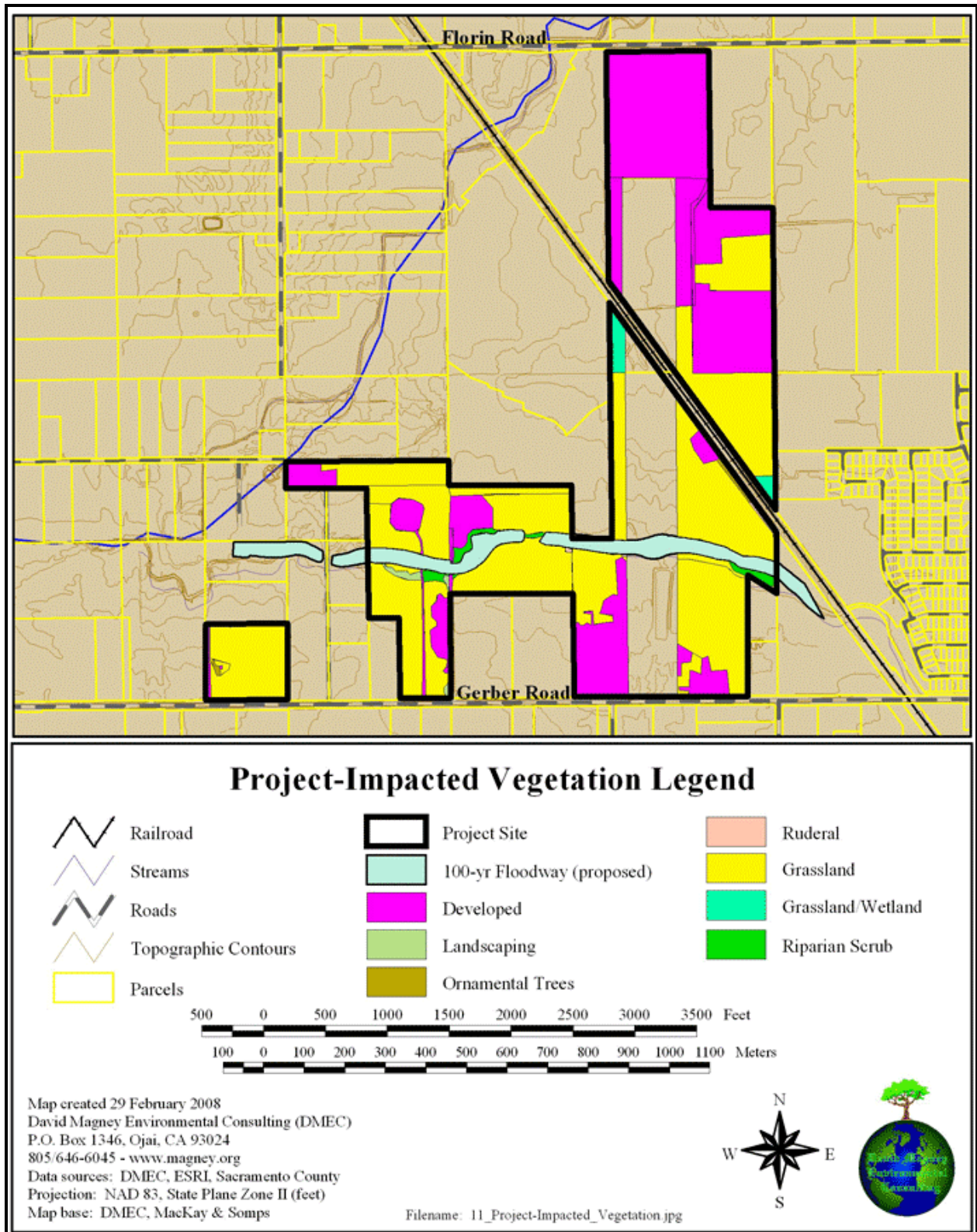
The total direct impacts to vegetation and habitats expected from project implementation are summarized in Table 17, Existing Habitats and Land Cover on the Project Site and Expected Impacts.

Table 17. Existing Habitats and Land Cover on the Project Site and Expected Impacts

Existing Habitats and Land Cover Observed	Total Onsite Acres	Onsite Impact Acres
Grassland	114.1	90.5
Grassland/Seasonal Wetland	3.2	2.0
Landscaping	0.6	0.6
Ornamental Trees	0.5	0.5
Riparian Scrub	4.8	1.5
Ruderal	0.5	0.3
Developed	78.3	59.7
Acreage Totals	202.0	155.0

No special-status plant species are known to be onsite or expected to be impacted by the proposed project. One (1) special-status wetland habitat occurring on the NVG site, Northern Hardpan Vernal Pool, will be impacted as a result of the project and those impacts are discussed under wetlands above. A total of approximately 155.0 acres will be disturbed by grading for the proposed development, excluding the area for wetland mitigation (which will be restored to natural habitat) and the Gerber Creek (which is part of a County of Sacramento project). The natural vegetation impacted by the proposed development is shown on Figure 11, Map of Project Impacts to Natural Vegetation.

Figure 11. Map of Project Impacts to Natural Vegetation



Wildlife

Five (5) special-status wildlife species occurring on or in the immediate vicinity of the NVG site are expected to be impacted as a result of project implementation. These five species include two (2) species of birds (*Agelaius tricolor* and *Elanus leucurus*) and three (3) species of aquatic invertebrates (*Branchinecta lynchi* [federally listed as Threatened], *Lepidurus packardii* [federally listed as Endangered], and *Lindleriella occidentalis*). Expected impacts to each of these species are discussed in detail below.

Agelaius tricolor – Tricolored Blackbird

CNDDDB OCCURRENCE INFORMATION (Occurrence No. 347, Updated 13 May 2004)

Presumed extant. “Horse Colony” site; Elder Creek, east of Central California Traction Railroad, 0.1 mile south of Florin Road, north of Elk Grove. Nesting substrate consists of blackberries; surrounded by grassland, to the south and east. Birds forage in surrounding grassland to the south and east, up to 2-3 miles from colony site. Owner claims that Tricolored Blackbirds have nested at this site annually prior to 1993. Site monitored May-June 1993 with 2,000 adults observed nesting. Unknown number observed nesting 11 May 1999 by Cook and Hamilton.

Department of Fish and Game. DFG printout of Tricolored Blackbird breeding observations. 2004.

Cook, Liz. Field survey form for *Agelaius tricolor* (nesting colony). 1993.

SPECIES INFORMATION

Year-round resident that is active during the day. Nests here in blackberry thicket and breeds in spring through fall (April-October/November). Feeds on insects, seeds, and grains in grasslands, wetlands, agricultural fields, and livestock operations near nesting colony.

DIRECT IMPACTS FROM PROJECT

Nesting colony site is not on the NVG project and no direct impacts are expected there. Construction activity, vehicular traffic, and domestic animals could disturb or cause the death of some birds.

INDIRECT IMPACTS FROM PROJECT

Project implementation will result in the loss of foraging habitat on the NVG site. Some foraging habitat will be available on the mitigation site. Nest sites affected by human disturbance.

CUMULATIVE EFFECTS

Project implementation will result in the net loss of foraging habitat available to this colony.

AVOIDANCE AND IMPACT MINIMIZATION MEASURES

Prior to and during construction activities, monitoring for Tricolored Blackbird shall be conducted as needed by qualified personnel to avoid impacts due to construction activities.

***Elanus leucurus* – White-tailed Kite**

CNDDDB OCCURRENCE INFORMATION (Occurrence No. 28, Updated 4 February 1994)

Presumed extant. South side of McCoy Avenue, 0.4 mile east of Elk Grove-Florin Road, south of Sacramento. Nest tree is located on rural residential property. 2 adults observed nesting in 1990.

Johnson, D. 1990 (obs). Field survey form for *Elanus caeruleus* (nest site). 1990.

SPECIES INFORMATION

Year-round resident that is active during the day and at twilight. Nests in trees and breeds February-October. Feeds on small mammals in grasslands, wetlands, agricultural fields, and riparian areas near nest site.

DIRECT IMPACTS FROM PROJECT

Nest site is not on the NVG project and no direct impacts are expected there. Construction activity, vehicular traffic, and domestic animals could cause the death of birds.

INDIRECT IMPACTS FROM PROJECT

Project implementation will result in the loss of foraging habitat on the NVG site. Some foraging habitat will be available on the mitigation site. Can be sensitive to human disturbance.

CUMULATIVE EFFECTS

Project implementation will result in the net loss of foraging habitat available to birds nesting at this site.

AVOIDANCE AND IMPACT MINIMIZATION MEASURES

Prior to and during construction activities, monitoring for White-tailed Kite shall be conducted as needed by qualified personnel to avoid impacts due to construction activities.

***Branchinecta lynchi* – Vernal Pool Fairy Shrimp**

CNDDDB OCCURRENCE INFORMATION (Occurrence No. 162, Updated 26 October 2006)

Presumed extant. North of Gerber Road, south of Florin Road, and east of Elk Grove-Florin Road about 5 miles north of Elk Grove. Seasonal wetlands, vernal pools, and roadside ditches somewhere in Sections 4, 5 and 6. *B. lynchi* observed in 1 of 3 seasonal wetlands and 1 of 48

vernal pools inspected in Section 4 (not on NVG site). Also observed in undescribed manmade feature in Section 5. Sugnet record numbers 58, 59 and 60. Brent Helm observed 10 in vernal pool 7 in northwest quarter of southeast quarter of Section 4.

Helm, Brent. Field survey form for *Branchinecta lynchi*. 2006.

Sugnet & Associates. Printout of location (T-R-S) of fairy shrimp sampling (obtained from the U.S. Fish And Wildlife Service). 1993.

SPECIES INFORMATION

Occur in vernal pools and other seasonal wetlands, generally in smaller pools. Hatch from cysts upon inundation in December and live until May when water temperatures exceed 75°F. Cysts may be transported by wildlife and wind, and can remain dormant and viable for a number of years. Filter feeders on small organisms suspended in the water.

DIRECT IMPACTS FROM PROJECT

All Vernal Pool Fairy Shrimp habitat, vernal pools and seasonal wetlands totaling 1.60 acres, will be filled and those areas will become part of the development. Onsite habitat will not be available until the mitigation site wetlands have been established.

INDIRECT IMPACTS FROM PROJECT

Wildlife that feed on Vernal Pool Fairy Shrimp will not have this resource available and cysts will not be transported by natural mechanisms..

CUMULATIVE EFFECTS

No cumulative negative impacts are expected. The establishment of vernal pools and seasonal wetlands totaling 1.75 acres on the mitigation site is expected to increase the wetland functionality onsite, will increase the total wetland area, and double the vernal pool area.

AVOIDANCE AND IMPACT MINIMIZATION MEASURES

There will be no avoidance of Vernal Pool Fairy Shrimp habitat, and working in the dry season will minimize impacts to any live fairy shrimp. Prior to and during construction activities, surveys and monitoring for Vernal Pool Fairy Shrimp shall be conducted as needed by a qualified biologist. Upon drying of onsite wetlands, soil shall be collected from numerous locations to allow reintroduction of fairy shrimp cysts to the mitigation site.

***Lepidurus packardii* – Vernal Pool Tadpole Shrimp**

CNDDDB OCCURRENCE INFORMATION (Occurrence No. 90, Updated 20 March 1997)

Presumed extant. North of Gerber Road, south of Florin Road, and east of Elk Grove-Florin Road about 5 miles north of Elk Grove. Natural seasonal wetlands, natural vernal pools, and manmade roadside ditches somewhere in Sections 4, 5 and 6. *L. packardii* observed in 1 of 3 seasonal wetlands and 4 of 48 vernal pools inspected in Section 4 (not on NVG site). Also

present in 3 of 21 seasonal wetlands inspected in Section 5 and 1 of 3 roadside ditches inspected in Section 6. Sugnet record numbers 136, 137, 138 and 139.

Sugnet & Associates. Printout of location (T-R-S) of fairy shrimp sampling (obtained from the U.S. Fish And Wildlife Service). 1993.

SPECIES INFORMATION

Occur in vernal pools and other seasonal wetlands, generally larger and deeper than for *B. lynchi*. Hatch from cysts upon inundation in December and live until pool dries. Tolerates water temperatures higher than 75°F. Cysts may be transported by wildlife and wind, and can remain dormant and viable for a number of years. Predatory on small invertebrates, aquatic larvae, and eggs.

DIRECT IMPACTS FROM PROJECT

All Vernal Pool Tadpole Shrimp habitat, vernal pools and seasonal wetlands totaling 1.60 acres, will be filled and those areas will become part of the development. Onsite habitat will not be available until the mitigation site wetlands have been established.

INDIRECT IMPACTS FROM PROJECT

Wildlife that feed on Vernal Pool Tadpole Shrimp will not have this resource available and cysts will not be transported by natural mechanisms.

CUMULATIVE EFFECTS

No cumulative negative impacts are expected. The establishment of vernal pools and seasonal wetlands totaling 1.75 acres on the mitigation site is expected to increase the wetland functionality onsite, will increase the total wetland area, and double the vernal pool area.

AVOIDANCE AND IMPACT MINIMIZATION MEASURES

There will be no avoidance of Vernal Pool Tadpole Shrimp habitat, and working in the dry season will minimize impacts to any live tadpole shrimp. Prior to and during construction activities, surveys and monitoring for Vernal Pool Tadpole Shrimp shall be conducted as needed by a qualified biologist. Upon drying of onsite wetlands, soil shall be collected from numerous locations to allow reintroduction of tadpole shrimp cysts to the mitigation site.

***Linderiella occidentalis* – California Linderiella**

CNDDDB OCCURRENCE INFORMATION (Occurrence No. 182, Updated 11 April 2000)

Presumed extant. Along Central California Traction Railroad, north of Calvine Road, south of Florin Road, and west of Vineyard Road. Long narrow rain filled depressions in railroad right-of-way. Land use is grazing and railroad right-of-way. Some adjacent pastures had really nice looking vernal pools. Undulating topography, red clay soils. Pools 5 x 10 to 15 meters. Threatened by railroad maintenance, conversion to residential, intensive agriculture, grazing,

dumping. Numerous to few adults observed, higher numbers in the middle section of mapped area. Also observed *Lepidurus* sp., clam shrimp, red copepods.

Kirpatrick, G. Field survey form for *Linderiella occidentalis* (California Linderiella). 1993.

OTHER OCCURRENCE INFORMATION

ECORP (2007) reported the presence of California Linderiella on the project site in the nonjurisdictional seasonal wetland identified as Snj1 in Figure 5 above.

SPECIES INFORMATION

Occur in vernal pools, other seasonal wetlands, and lakes. Hatch from cysts upon inundation in December and live until pool dries. Tolerates water temperatures up to 85°F. Cysts may be transported by wildlife and wind, and can remain dormant and viable for a number of years. Feed on a variety of small aquatic organisms and detritus.

DIRECT IMPACTS FROM PROJECT

All California Linderiella habitat, vernal pools and seasonal wetlands totaling 1.60 acres, will be filled and those areas will become part of the development. Onsite habitat will not be available until the mitigation site wetlands have been established.

INDIRECT IMPACTS FROM PROJECT

Wildlife that feed on California Linderiella will not have this resource available and cysts will not be transported by natural mechanisms.

CUMULATIVE EFFECTS

No cumulative negative impacts are expected. The establishment of vernal pools and seasonal wetlands totaling 1.75 acres on the mitigation site is expected to increase the wetland functionality onsite, will increase the total wetland area, and double the vernal pool area.

AVOIDANCE AND IMPACT MINIMIZATION MEASURES

There will be no avoidance of California Linderiella habitat, and working in the dry season will minimize impacts to any live *Linderiella*. Prior to and during construction activities, surveys and monitoring for California Linderiella shall be conducted as needed by a qualified biologist. Upon drying of onsite wetlands, soil shall be collected from numerous locations to allow reintroduction of *Linderiella* cysts to the mitigation site.

SECTION VIII. CONCLUSIONS AND RECOMMENDATIONS

The proposed project would result in the disturbance, temporary and permanent, impact to approximately 99.9 acres of natural vegetation, including vegetation that is or has been routinely disturbed, primarily for harvesting hay.

The proposed project would not directly impact any listed species; however, three (3) special-status species, including *Linderiella californica*, Swainson's Hawk, and White-tailed Kite, could be indirectly impacted by the loss of suitable foraging and nesting habitat.

Proposed mitigation onsite will replace all impacted wetlands onsite immediately adjacent to and north of Gerber Creek, and provide suitable habitat for *Branchinecta lynchi*, *B. mesovallensis*, *Lepidurus packardi*, *Linderiella californica*, and foraging habitat for Swainson's Hawk and White-tailed Kite. This will be accomplished through the creation of 1.75 acres of seasonal wetlands, including vernal pools, surrounded by annual grassland relatively rich in native plant species.

The proposed project, with mitigation, is not likely to jeopardize any of the listed or candidate species present in the area with extinction.

SECTION IX. ACKNOWLEDGEMENTS

This report was written by David Magney and Stephen Hoskinson. Graphics were created by Mr. Magney and William Abbott.

Joel Butterworth conducted a detailed analysis of the soils of the proposed wetland creation site. Matt Gause, Brent Helm, and Mark Rains provided advise and guidance about wetland creation and habitat suitability for sensitive aquatic invertebrate species. ECORP provided information about aquatic invertebrates found onsite.

Peter Daru and Diana Rains provided guidance and assistance with the project description and providing current project plans and drawings. Development plans were prepared by MacKay & Soms of Sacramento.

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PERSONAL COMMUNICATIONS

- Matt Gause, Restoration Ecologist, personal communication regarding suitability of wetland creation onsite and habitat suitability for listed fair shrimp, 2006.
- Brent Helm, Fairy Shrimp expert, personal communication regarding suitability of habitat for listed fairy shrimp in existing vernal pools onsite, 2007.
- Andrea Jones, Regulatory Project Manager, U.S. Army Corps of Engineers, Sacramento, California; Meeting in Sacramento on 27 February 2007 regarding the North Vineyard Greens Section 404 Individual Permit Application.
- Mark C. Rains, Associate Professor, Wetland Scientist, University of Southern Florida, personal communication regarding seasonal wetland and vernal pool creation at the North Vineyard Greens project site.

APPENDICES

APPENDIX A

USFWS Biological Opinion – NVG Unit 1

USFWS Biological Opinion – NVG Unit 3

APPENDIX B

Mitigation Site Plant Palettes

APPENDIX A

USFWS Biological Opinion – NVG Unit 1 Pages A2-A5

USFWS Biological Opinion – NVG Unit 3 Pages A6-A9



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846



In reply refer to:
1-1-04-F-0276

OCT 15 2004

Mr. Justin Cutler
Chief, Sacramento Valley Office
Department of the Army
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Subject: Review of the North Vineyard Greens Unit # 1 Project (Corps # 200400272),
Sacramento County, California, for Inclusion with the Vernal Pool
Crustaceans Programmatic Consultation

Dear Mr. Cutler:

This letter responds to your July 1, 2004, request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed North Vineyard Greens Unit # 1 project, Sacramento County, California. We received your letter on July 6, 2004. The Service has reviewed the biological information submitted by your office describing the effects of the proposed project on the federally endangered vernal pool tadpole shrimp (*Lepidurus packardii*) and the threatened vernal pool fairy shrimp (*Branchinecta lynchi*). You determined that the proposed project may affect the federally-listed giant garter snake (*Thamnophis gigas*) and slender Orcutt grass (*Orcuttia tenuis*). We have determined that the proposed project is not likely to adversely affect giant garter snake because no summer water is present in Gerber Creek; therefore, no suitable habitat is present. We have also determined that the vernal pools on the proposed project site do not provide suitable habitat for the slender Orcutt grass because they do not pond long enough to provide suitable habitat. Additionally, you requested that we provide a conference opinion on the California tiger salamander (*Ambystoma californiense*). We have determined that the proposed project is not likely to adversely affect the California tiger salamander because the proposed project is outside the range of the species. Although your request did not include a request to append this project to the Service's *Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California* (Programmatic Consultations), the Service has determined that the proposed project can be appended to the Services' Programmatic Consultations. This response is issued

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Mr. Justin Cutler

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under the authority of section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.* Act).

The findings and recommendations in this consultation are based on: (1) the April 15, 2004, Section 404 Individual Permit Application for the North Vineyard Greens Unit #3, Sacramento, California, prepared by ECORP Consulting Inc. (ECORP); (2) the July 1, 2004 letter from you requesting formal consultation on the proposed project; (3) the July 22, 2004, proposed project site visit conducted by staff from ECORP Consulting Inc. and attended by Ken Fuller and Kelli Angel of the Service; (4) a September 29, 2004, letter and map from ECORP responding to our requests for additional information on suitable federally-listed branchiopod habitat on the proposed project site; and (5) other information available to the Service.

Project Description

The proposed 147-acre subdivision project site is located in Sacramento County. The applicant proposes to construct 363 single family residential units, open space areas, and associated internal roads. The proposed project site contains 4.172 acres of jurisdictional wetlands and includes 0.147 acres of vernal pools, 1.862 acres of seasonal wetlands, 0.974 acres of seasonal marsh, and a 1.189-acre section of Gerber Creek. The applicant has decided to assume the presence of federally-listed vernal pool invertebrates in the agreed-upon selected jurisdictional wetlands. The agreed-upon selected wetlands are a subset of all the jurisdictional water of the United States. Direct effects to suitable vernal pool crustacean habitat total 0.956 acres and include 0.147 acre of vernal pool, 0.544 acre of seasonal wetlands, 0.130 acre seasonal marsh, and 0.135 acre of stock pond. Indirect effects to suitable vernal pool crustacean habitat total 1.05 acres and include 0.540 acre of vernal pools, 0.226 acre of seasonal wetlands, and 0.284 acre of seasonal marsh. Thus, total affected suitable vernal pool crustacean habitat consists of 2.006 acres on the proposed project site. The applicant has agreed to purchase vernal pool conservation acres at a Service-approved conservation bank prior to any site ground-breaking disturbances.

The Service has determined that it is appropriate to append the proposed project to the Programmatic Consultation. This letter is an agreement by the Service to append the proposed project to the Programmatic Consultation and represents the Service's biological opinion on the effects of the proposed action. Conservation measures for projects appended to the Programmatic Consultations involve the use of creation and preservation banks in combination with on-site conservation options where such options are appropriate.

The Service reevaluates the effectiveness of the Programmatic Consultation at least every six (6) months to ensure that continued implementation will not result in unacceptable effects to the listed species.

Vernal Pools Conservation Measures

In accordance with the Programmatic Consultation, projects that are appended to that biological opinion will be used to minimize the adverse effects of the proposed project using a combination

Mr. Justin Cutler

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of habitat preservation and creation measures. The conservation measures identified in the Programmatic Consultation include the following:

1. Preservation component.

For every acre of habitat directly or indirectly affected, at least two vernal pool credits will be dedicated within a Service-approved ecosystem preservation bank, or, based on Service evaluation of site-specific conservation values, three acres of vernal pool habitat may be preserved on the project site or another non-bank site as approved by the Service.

2. Creation component.

For every acre of habitat directly affected, at least one vernal pool creation credit will be dedicated within a Service-approved habitat creation bank, or, based on Service evaluation of site-specific conservation values, two acres of vernal pool habitat will be created and monitored on the project site or another non-bank site as approved by the Service.

3. On and Off-site Conservation Options

Listed vernal pool crustacean habitat and associated uplands utilized as on-site conservation will be protected from adverse effects and managed in perpetuity or until the Corps, the applicant, and the Service agree on a process to exchange such areas for credits within a Service-approved conservation banking system. Off-site conservation at a Service-approved non-bank location will be protected and managed in perpetuity through a Service-approved conservation easement, Service-approved management plan, and a sufficiently large enough endowment fund size to manage the site in perpetuity in accordance with the management plan.

The proposed project will result in direct effects to 0.956 acres of suitable habitat for the two federally listed vernal pool crustaceans. Indirect effects to vernal pools are anticipated and total 1.05 acres. Therefore, the total affected acreage is 2.006 acres of suitable vernal pool crustacean habitat. The applicant has identified and agreed to purchase conservation credits at a Service-approved conservation bank or Service-approved fund. Compensation for both preservation and creation will be purchased prior to any site disturbance. The agreed upon conservation responsibilities of the applicant are as follows.

1. Prior to the start of construction, the applicant will purchase at least 4.012 vernal pool preservation acres within a Service-approved ecosystem vernal pool preservation bank or fund account serving the Sacramento County area.
2. Prior to the start of construction, the applicant will purchase at least 0.956 vernal pool creation/restoration acres within a Service-approved vernal pool creation bank or fund account serving the Sacramento County area.

Mr. Justin Cutler

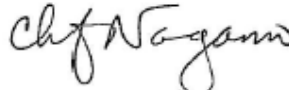
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REINITIATION-CLOSING STATEMENT

This concludes formal consultation on the proposed North Vineyard Greens Unit #1 project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this letter, please contact Ken Fuller or the Acting Sacramento Valley Branch Chief at (916) 414-6645.

Sincerely,



Chris Nagano, Chief
Endangered Species Division

cc:

ARD (ES) Portland, OR
CDFG, Chico, CA (Terry Roscoe)
ECORP Consulting Inc., Roseville, CA (Attn: Bjorn Gregersen)
North Vineyard Greens G. P., Sacramento, CA (Attn: Peter Daru)
CRWQCB, Sacramento, CA (Attn: Gary Carlton)



IN REPLY REFER TO
1-1-04-F-0269

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W2605
Sacramento, California 95825-1846



AUG 17 2004

Mr. Justin Cutler
Chief, Sacramento Valley Office
Regulatory Branch
U. S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Subject: Review of the North Vineyard Greens Unit #3 Project (Corps # 200400274),
Sacramento County, California, for Inclusion with the Vernal Pool Crustaceans
Programmatic Consultation

Dear Mr. Cutler:

This letter responds to your July 1, 2004, request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed North Vineyard Greens Unit # 3 project, Sacramento County, California. The Service has reviewed the biological information submitted by your office describing the effects of the proposed project on the federally endangered vernal pool tadpole shrimp (*Lepidurus packardii*) and the threatened vernal pool fairy shrimp (*Branchinecta lynchi*). You determined that the proposed project may affect the threatened giant garter snake (*Thamnophis gigas*) and threatened slender Orcutt grass (*Orcuttia tenuis*). We have determined that the proposed project is not likely to adversely affect the giant garter snake because no surface water is present during the summer months in Gerber Creek; therefore, no suitable habitat is present on the proposed project site. We also have determined that the vernal pools on the proposed project site do not provide suitable habitat for the slender Orcutt grass because they do not pond surface water long enough to for this listed plant. Additionally, you requested that we provide a conference opinion on the California tiger salamander (*Ambystoma californiense*). We have determined that the proposed project is not likely to adversely affect this listed amphibian because the proposed project is outside the range of the species. Although your request did not include a request to append this project to the Service's *Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California* (Programmatic Consultation), the Service has determined that the proposed project can be

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appended to the Services' Programmatic Consultation. This response is issued under the authority of section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq. Act).

The findings and recommendations in this consultation are based on: (1) the April 15, 2004, Section 404 Individual Permit Application for the North Vineyard Greens Unit #3, Sacramento, California, prepared by ECOPR Consulting Inc.; (2) the July 1, 2004 letter from you requesting formal consultation on the proposed project; (3) the July 22, 2004 proposed project site visit conducted by staff from ECORP Consulting Inc. and attended by Ken Fuller and Kelli Angel of the Service; and (4) other information available to the Service.

Project Description

The proposed 49-acre subdivision project site is located in southern Sacramento County, California. The applicant proposes to construct 138 single family residential units, open space areas, and associated internal roads. The proposed project site contains 1.446 acres of jurisdictional wetlands and including 0.44 acres of vernal pools and a 1.006-acre section of Gerber Creek. The applicant is assuming the presence of federally listed vernal pool invertebrates in the vernal pools. The proposed project would not result in any indirect effects to the two listed vernal pool branchiopods or their habitat. The applicant has agreed to purchase vernal pool conservation acres at a Service-approved conservation bank prior to any ground breaking disturbances.

The Service has determined that it is appropriate to append the proposed project to the Service's Programmatic Consultation. This letter is an agreement by the Service to append the proposed project to the Programmatic Consultation and represents the Service's biological opinion on the effects of the proposed action. Conservation measures for projects appended to the Programmatic Consultations involve the use of creation and preservation banks in combination with on-site conservation options where such options are appropriate.

The Service reevaluates the effectiveness of the Programmatic Consultation at least every six (6) months to ensure that continued implementation will not result in unacceptable effects to the listed species.

Vernal Pools Conservation Measures

In accordance with the Programmatic Consultation, projects that are appended to that biological opinion will be used to minimize the adverse effects of the proposed project using a combination of habitat preservation and creation measures. The conservation measures identified in the Programmatic Consultation includes the following:

Mr. Justin Cutler

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1. **Preservation component.**

For every acre of habitat directly or indirectly affected, at least two vernal pool credits will be dedicated within a Service-approved ecosystem preservation bank, or, based on Service evaluation of site-specific conservation values, three acres of vernal pool habitat may be preserved on the project site or another non-bank site as approved by the Service.

2. **Creation component.**

For every acre of habitat directly affected, at least one vernal pool creation credit will be dedicated within a Service-approved habitat creation bank, or, based on Service evaluation of site-specific conservation values, two acres of vernal pool habitat will be created and monitored on the project site or another non-bank site as approved by the Service.

3. **On and Off-site Conservation Options.**

Listed vernal pool crustacean habitat and associated uplands utilized as on-site conservation will be protected from adverse effects and managed in perpetuity, or until the Corps, the applicant, and the Service agree on a process to exchange such areas for credits within a Service-approved conservation banking system. Off-site conservation at a Service-approved non-bank location will be protected and managed in perpetuity through a Service-approved conservation easement, Service-approved management plan, and a sufficient endowment fund to manage the site in perpetuity in accordance with the management plan.

The proposed project will result in direct effects to 0.44 acres of vernal pools that provide suitable habitat for the two federally listed vernal pool crustaceans. No indirect effects to vernal pools are anticipated. Therefore, the total affected acreage is 0.44 acres of vernal pools. The applicant has identified and agreed to purchase conservation credits at a Service-approved conservation bank. Compensation for both preservation and creation will be purchased prior to the fill of any vernal pool areas. The agreed upon conservation responsibilities of the applicant are as follows.

1. Prior to the start of construction, the applicant will purchase at least 0.88 vernal pool preservation credits within a Service-approved ecosystem vernal pool preservation bank or fund account serving the Sacramento County area.
2. Prior to the start of construction, the applicant will purchase at least 0.44 vernal pool creation credits within a Service-approved vernal pool creation bank or fund account serving the Sacramento County area.

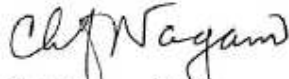
Mr. Justin Cutler

REINITIATION-CLOSING STATEMENT

This concludes formal consultation on the proposed North Vineyard Greens Unit #3 project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this letter for the North Vineyard Greens Unit #3 Project, please contact Ken Fuller or the Sacramento Valley Branch Chief, Adam Zerrenner at (916) 414-6645.

Sincerely,



Chris Nagano, Chief
Endangered Species Division

cc:

ARD (ES) Portland, OR
CDFG, Rancho Cordova, CA (Terry Roscoe)
ECORP Consulting Inc., Roseville, CA (Attn: Bjorn Gregersen)
North Vineyard Greens G. P., Sacramento, CA (Attn: Peter Daru)
CRWQCB, Sacramento, CA (Attn: Gary Carlton)

APPENDIX B

Mitigation Site Plant Palettes

Wetland Plant Palette for the NVG Mitigation Site

Scientific Name	Common Name	Habit ¹⁸	WIS ¹⁹	Propagation Method
<i>Vernal Pool</i>				
<i>Callitriche marginata</i>	Winged Water-starwort	AH	OBL	Seed
<i>Castilleja campestris</i> ssp. <i>campestris</i>	Field Owl's Clover	AH	OBL*	Seed
<i>Deschampsia danthonioides</i>	Annual Hairgrass	AG	FACW	Seed
<i>Eleocharis macrostachya</i>	Creeping Spikerush	PG	OBL	Seed/Cuttings
<i>Epilobium ciliatum</i>	Northern Willow-herb	PH	FACW	Seed
<i>Epilobium densiflorum</i>	Dense-flowered Willow-herb	AH	OBL	Seed
<i>Epilobium pygmaeum</i>	Smooth Spike-primrose	AH	OBL	Seed
<i>Eryngium vaseyi</i>	Coyote-thistle	PH	FACW	Seed
<i>Gratiola ebracteata</i>	Bractless Hedge Hyssop	AH	OBL	Seed
<i>Hordeum brachyantherum</i>	Meadow Barley	PG	FACW	Seed
<i>Hordeum depressum</i>	Alkali Barley	AG	FACW	Seed
<i>Juncus bufonius</i>	Common Toad Rush	AG	OBL	Seed/Cuttings
<i>Lasthenia fremontii</i>	Fremont's Goldfields	A/PH	OBL	Seed
<i>Lasthenia glaberrima</i>	Smooth Goldfields	AH	OBL	Seed
<i>Navarretia leucocephala</i>	Whitehead Navarretia	AH	OBL	Seed
<i>Plagiobothrys stipitatus</i>	Stalked Popcornflower	AH	OBL	Seed
<i>Psilocarphus brevissimus</i>	Dwarf Woollyheads	AH	OBL	Seed
<i>Ranunculus bonariensis</i>	Carter's Buttercup	AH	OBL	Seed
<i>Triteleia hyacinthina</i>	White Brodiaea	PH	FACW*	Seed
<i>Veronica peregrina</i>	Neckweed	AH	OBL	Seed

¹⁸ Habit definitions: AG = annual grass or graminoid; AH = annual herb; F = Fern; PG = perennial grass or graminoid; PH = perennial herb; PV = perennial vine; S = shrub; T = tree.

¹⁹ WIS = Wetland Indicator Status. The following code definitions are according to Reed (1988):

OBL = obligate wetland species, occurs almost always in wetlands (>99% probability).

FACW = facultative wetland species, usually found in wetlands (67-99% probability).

FAC = facultative species, equally likely to occur in wetlands or nonwetlands (34-66% probability).

FACU = facultative upland species, usually found in nonwetlands (67-99% probability).

UPL = obligate upland species in this region (99% probability), occurs in wetlands in another region

NI = no indicator status has been assigned due to a lack of information.

+ or - symbols are modifiers that indicate greater or lesser affinity for wetland habitats.

* = tentative assignment to that indicator status by Reed (1988).

() Parentheses indicate a wetland status suggested by David L. Magney based on extensive field observations.

Scientific Name	Common Name	Habit ¹⁸	WIS ¹⁹	Propagation Method
<i>Seasonal Wetland & Seasonal Wetland Swale</i>				
<i>Centaurium muhlenbergii</i>	Monterey Centaury	AH	FAC	Seed
<i>Cyperus eragrostis</i>	Umbrella-sedge	PG	FACW	Seed/Cuttings
<i>Epilobium ciliatum</i>	Northern Willow-herb	PH	FACW	Seed
<i>Epilobium densiflorum</i>	Dense-flowered Willow-herb	AH	OBL	Seed
<i>Gnaphalium palustre</i>	Lowland Cudweed	AH	FACW	Seed
<i>Hordeum brachyantherum</i>	Meadow Barley	PG	FACW	Seed
<i>Hordeum depressum</i>	Alkali Barley	AG	FACW	Seed
<i>Juncus balticus</i>	Baltic Rush	PG	OBL	Seed/Cuttings
<i>Juncus bufonius</i>	Common Toad Rush	AG	OBL	Seed/Cuttings
<i>Juncus effusus</i>	Common Rush	PG	OBL	Seed/Cuttings
<i>Juncus xiphioides</i>	Iris-leaved Rush	PG	OBL	Seed/Cuttings
<i>Phyla nodiflora</i>	Turkey Tangle Fogfruit	PH	FACW	Seed/Cuttings
<i>Triteleia hyacinthina</i>	White Brodiaea	PH	FACW*	Seed
<i>Veronica peregrina</i>	Neckweed	AH	OBL	Seed
<i>Xanthium strumarium</i>	Cocklebur	AH	FAC+	Seed
<i>Seasonal Marsh</i>				
<i>Callitriche marginata</i>	Winged Water-starwort	AH	OBL	Seed
<i>Cyperus eragrostis</i>	Umbrella-sedge	PG	FACW	Seed/Cuttings
<i>Eleocharis macrostachya</i>	Creeping Spikerush	PG	OBL	Seed/Cuttings
<i>Epilobium pygmaeum</i>	Smooth Spike-primrose	AH	OBL	Seed
<i>Juncus effusus</i>	Common Rush	PG	OBL	Seed/Cuttings
<i>Juncus xiphioides</i>	Iris-leaved Rush	PG	OBL	Seed/Cuttings
<i>Lemna minuscula</i>	Least Duckweed	AH	OBL	Transplant
<i>Ludwigia peploides</i>	Floating Water-primrose	PH	OBL	Seed
<i>Polygonum hydropiperoides</i>	Swamp Smartweed	PH	OBL	Seed
<i>Polygonum punctatum</i>	Dotted Smartweed	A/PH	OBL	Seed
<i>Ranunculus bonariensis</i>	Carter's Buttercup	AH	OBL	Seed
<i>Schoenoplectus [Scirpus] acutus</i>	Hardstem Bulrush	PG	OBL	Seed/Cuttings
<i>Typha latifolia</i>	Cattail	PG	OBL	Seed/Cuttings
<i>Xanthium strumarium</i>	Cocklebur	AH	FAC+	Seed

Restored Grassland Native Plant Palette for the NVG Mitigation Site

Scientific Name	Common Name	Habit	WIS	Propagation Method
<i>Grasses</i>				
<i>Bromus carinatus</i>	California Brome	AG	-	Seed
<i>Deschampsia danthonioides</i>	Annual Hairgrass	AG	FACW	Seed
<i>Elymus glaucus</i>	Blue Wildrye	PG	FACU	Seed
<i>Elymus multisetus</i>	Big Squirreltail Grass	AG	-	Seed
<i>Hordeum brachyantherum</i>	Meadow Barley	PG	FACW	Seed
<i>Hordeum depressum</i>	Alkali Barley	AG	FACW	Seed
<i>Leymus triticoides</i>	Creeping Wildrye	PG	FAC+	Seed/Sod/Rhizome
<i>Poa secunda</i>	Sandberg Bluegrass	PG	FACU	Seed
<i>Vulpia microstachys</i>	Small Fescue	AG	-	Seed
<i>Vulpia octoflora</i>	Slender Fescue	AG	UPL	Seed
<i>Forbs</i>				
<i>Amsinckia menziesii</i>	Rancher's Fire	AH	-	Seed
<i>Asclepias fascicularis</i>	Narrowleaf Milkweed	PH	FAC	Seed/Rhizome
<i>Brodiaea coronaria</i>	Harvest Brodiaea	PH	(FAC)	Seed
<i>Castilleja attenuata</i>	Valley Tassels	AH	-	Seed
<i>Epilobium brachycarpum</i>	Panicled Willow-herb	AH	UPL	Seed
<i>Eremocarpus setigerus</i>	Dove Weed	AH	-	Seed
<i>Galium aparine</i>	Goose Grass	AH	FACU	Seed
<i>Grindelia camporum</i>	Great Valley Gumplant	PH	FACU	Seed
<i>Hemizonia fitchii</i>	Fitch's Tarweed	AH	-	Seed
<i>Holocarpha virgata</i>	Yellowflower Tarweed	AH	-	Seed
<i>Lepidium nitidum</i>	Common Peppergrass	AH	-	Seed
<i>Lotus purshianus</i>	Spanish Clover	AH	UPL	Seed
<i>Plantago erecta</i>	California Plantain	AH	-	Seed
<i>Trichostema lanceolatum</i>	Vinegarweed	AH	-	Seed
<i>Triteleia laxa</i>	Ithuriel's Spear	PH	-	Seed
<i>Wyethia angustifolia</i>	California Compassplant	PH	FACU-	Seed