SPECIAL-STATUS PLANT SURVEY AND HABITAT ASSESSMENT

1997, 1998 Surveys

for

Navy Fuel Depot
Point Molate
Contra Costa County, California

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SUMMARY

Navy Fuel Depot (NFD), Point Molate, is located adjacent to San Francisco Bay near the City of Richmond, Contra Costa County. The site is situated on west- and southwest-facing slopes, below a low, coastal ridge line, which is part of the Potrero Hills.

The vegetation of the Potrero Hills and Point Molate has been subjected to years of human disturbance. By 1915, much of the Potrero Hills and adjacent low-lying lands to the south and east had been transformed by the development of industry. In 1907, approximately 27 acres at Point Molate were developed as a winery by the California Wine Association. The winery, named Winehaven, is listed in the National Register of Historic Places. In 1942, the Winehaven property was acquired by the U.S. Navy and was developed as a fuel supply depot during World War II. By 1944, the Navy had installed 20 55,000 barrel concrete fuel tanks.

A total of eight separate seasonal surveys, consisting of 26 person days were conducted between April and August 1997 and March and August 1998 to survey and map the vegetation. Major natural plant communities occurring at NFD Point Molate include northern coastal salt marsh, northern coastal bluff scrub, coastal terrace prairie, northern coastal scrub, Central Coast riparian scrub, and coastal freshwater marsh. Prominent nonnative habitats occurring on site include ruderal, nonnative annual grasslands, eucalyptus woodland, and nonnative scrub/shrubland.

Of the 63 target special-status plant taxa searched for, only one, marsh gumplant (*Grindelia stricta* var. *angustifolia*), has been located. This relatively common saltmarsh species occurs in large numbers along the shoreline of the site. The potential for occurrence of the remaining 62 target taxa is considered to be low to none due to a lack of suitable habitat or the fact that they would have been detectable during the surveys but were not observed.

Although not afforded any formal status as special-status species, numerous plant taxa of botanical interest do occur on site. Species whose distribution in the East Bay is restricted entirely to the Potrero Hills include dichondra, and seaside woolly-sunflower. Species known from the East Bay but never before recorded from the Point Richmond area include foothill sedge, rein orchid, chaffweed, golden dock, fragile fern, and remote-leaved thistle. Species never before recorded from the East Bay include wild hyacinth, Jepson's blue wildrye, and Vancouver's ryegrass. Species known from five or fewer locations in the East Bay include slender rush, deer-bed sedge, bluff lettuce, fragrant everlasting, yellow bush lupine, plump-seeded madia, willow dock, white brodiaea, and congested toad rush. Species known from fewer than 15 locations in the East Bay include Dutchman's pipevine, centaury, coast buckwheat, red fescue, large-flowered sand-spurrey, brownie thistle, stipitate popcorn-flower, Davy's centaury, and blue toadflax. These taxa represent botanically unusual resources in the East Bay.

INTRODUCTION

Pursuant to the 1995 amendments to the Base Realignment and Closure (BRAC) Act of 1990, the Navy was directed to close the Fleet and Industrial Supply Center (NFD) Oakland, California. The Naval Fuel Depot (NFD) Point Molate is a property under the control and jurisdiction of NFD Oakland and as such has been closed and placed into caretaker status until it can be disposed. Mission cease date was September 30, 1995. The City of Richmond has developed a Reuse Plan for NFD Point Molate.

This report presents the results of a series of special-status plant surveys of the NFD Point Molate. This report describes existing habitats and natural communities within the study area, lists all potentially occurring special-status plant species, and provides an assessment of their potential for occurrence on site. A complete inventory of native and nonnative plant species detected during the surveys is provided in Appendix A.

NFD Point Molate is located on San Francisco Bay on the east shore of San Pablo Strait (Figure 1). The site is situated approximately 1 mile north of the eastern end of the Richmond-San Rafael Bridge in western Contra Costa County. NFD Point Molate is located on the Potrero Hills, a ridge line extending from Point San Pablo in the north, approximately 5.5 miles to Shoal Point at the mouth, to Richmond Inner Harbor. Point Molate is located approximately 3.5 miles across the strait from San Pedro Point, Point San Quentin, and Point Chauncey on the Tiburon Peninsula, Marin County. It is also located approximately 13.5 miles from the western end of the Carquinez Strait.

The study area covers approximately 300 acres of terrestrial habitats extending from the shoreline to near the ridge line. The limits of the study area are defined by the shoreline and a chain-link fence.

Figure 1. Location of the study area.

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2.0 SURVEY METHODS AND LIMITATIONS

A series of botanical surveys were conducted throughout the study area. A total of eight 2-day surveys were performed by botanists Michael Wood, Chris Rogers, and Chris Thayer of Sycamore Asscociates LLC. The 1997 surveys were conducted on April 23, 25, and 27; May 21 and 23; June 18 and 19; and August 18 and 20. The 1998 surveys were conducted on March 23 and 24; May 4 and 5; June 15 and 16; and August 10 and 11. The primary objectives of the surveys were to:

- map and enumerate all populations of special-status plant taxa;
- assess the potential for occurrence of special-status plant taxa;
- inventory plant taxa occurring within the study area.

A list of potentially-occurring special-status plant taxa was compiled through a review of:

- California Natural Diversity Data Base (CNDDB) print-outs for the Richmond, San Quentin, and Mare Island United States Geological Survey (USGS) quads (CDFG, 1997c);
- California Native Plant Society's (CNPS) *Electronic Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik, 1997);
- *Endangered, Threatened and Rare Plants of California* (CDFG, 1998b);
- *Special Plants List* (CDFG, 1998a);
- *Endangered and Threatened Wildlife and Plants* (USFWS, 1995);
- *Endangered and Threatened Plant and Animal Taxa: Proposed Rule* (USFWS, 1996a);
- *Federally Listed and Proposed Endangered and Threatened Plants of California* (USFWS, 1996b).

Additional information on plant taxa of botanical interest was compiled from the CNPS East Bay Chapter's *Unusual and Significant Plants of Alameda and Contra Costa Counties* (Lake, 1995) and *Status of Rare, Threatened and Endangered Vascular Plants in Alameda and Contra Costa Counties (and some adjacent areas)* (Olson, 1994).

Literature reviewed in preparation of field surveys included:

- a summary report of a single site visit conducted by the East Bay Chapter of CNPS (Lake, 1996);

- *Natural Resources Management Plan, Naval Supply Center Oakland, Fuel Department, Point Molate Site* (Havlik, 1982);

- *Natural Resources Management Plan, Point Molate Fuel Supply Depot* (LSA, 1987);

- *Winehaven, Point Molate Naval Fuel Depot: Photographs and Written Historical and Descriptive Data* (U.S. Dept. of the Interior, no date);

- *Final Jurisdictional Wetland Delineation of Fleet Industrial Supply Center, Naval Fuel Depot, Point Molate* (Tetra Tech, 1996).

Local and regional floras, field studies, and other literature reviewed include Clarke (1952), Ertter (1997), Howell *et al.* (1958), Howell (1970), McClintock *et al.* (1990), Ripley (1980), Shuford and Timossi (1989), Thomas (1961), and Wood (1994, 1996a, 1996b). Knowledgeable persons interviewed include Dianne Lake, Rare Plant Committee, East Bay Chapter, CNPS; Caitlin Bean, Environmental Specialist, California Department of Fish and Game (CDFG), Region 3; Barbara Ertter, Botanist, University of California, Berkeley, Jepson Herbarium; and Noreen Roster, Environmental Protection Specialist, U.S. Navy, Environmental Planning Branch.

The entire study area was surveyed eight seperate times throughout the spring, early summer, and early fall flowering seasons in 1997 and 1998. All surveys were conducted by foot, and survey methods conformed to those outlined by CDFG (1984). All distinct plant communities were surveyed and characterized, and all plant species detected were identified in the field or lab and recorded (Appendix A). Native plant communities have been mapped during previous studies (LSA 1987). However, all special-status plant species, species of botanical interest, and botanically significant plant communities were mapped. Other plant taxa of local botanical interest were also mapped in the field. A compilation of the distribution of plant communities and significant botanical resources was prepared on a 1"=200' scale map. To aid in mapping and in assessing habitats, a 1" = 2000' scale black and white aerial photograph flown in 1970 (USDA, 1977) was reviewed. Additional aerial photographs made available by the Navy for review include an oblique, infra-red aerial photograph (3/29/89) and black and white aerial photographs dated 7/5/94, 4/8/92, 6/12/90, 3/30/88, 5/15/85, 6/21/83, 9/14/79, 5/19/75, 4/24/73, 5/19/71, 5/2/69, 7/3/59, 5/3/57 and 8/14/53.

Nomenclature used throughout this report conforms to Hickman (1993) for plants and Holland (1986) for vegetation communities; plant community descriptions conforming to Sawyer and Keeler-Wolf (1995) and Cowardin *et al.* (1979) are also given where appropriate. Nomenclature for special-status plant species conforms to CDFG (1997b) and Skinner and Pavlik (1997).

3.0 HISTORICAL AND EXISTING CONDITIONS

This section summarizes the history of development at NFD Point Molate, the physical setting, and describes the existing plant communities and special status plant species.

3.1 HISTORICAL ACTIVITIES

The vegetation of the Potrero Hills and Point Molate has been subjected to a long history of human disturbance. Prior to colonization by Europeans, the Potrero Hills consisted of windswept grasslands and coastal scrub on the hillsides and scattered woodlands in ravines and sheltered slopes. Indigenous peoples are known to have made considerable use of the area. Subsequent to colonization, the land encompassing the Potrero Hills was part of the Rancho San Pablo land grant, granted to Francisco Castro by California Governor José Figueroa in 1835 (Havlik, 1982). Use of the area was primarily restricted to the grazing of livestock.

Around 1901, a portion of the northern Potrero Hills was acquired by Standard Oil, which developed an oil refinery and oil storage facilities. By 1915, much of the Potrero Hills and adjacent low-lying lands to the south and east of the site had been transformed by the development of industry (Havlik, 1982). Rail lines and other infrastructure to support industrial and manufacturing enterprises were developed. Several quarries which were operated in the hills, significantly altering the landscape.

Approximately 27 acres were developed by the California Wine Association on Point Molate. The site, named Winehaven, consisted of a complex of buildings constructed between 1907 and 1919 and was in operation until 1925 (U.S. Dept. of the Interior, no date). Thirty-five of the original 49 Winehaven structures are still standing, including warehouses, employee houses, and wine master's quarters. During the development and operation of Winehaven, an extensive eucalyptus grove was planted, which altered the natural vegetation in the northern portion of the study area.

The Winehaven property was acquired by the U.S. Navy in 1942 and was developed as a fuel supply depot during World War II. By 1944, the Navy had installed 20 55,000 barrel concrete fuel tanks, on the west-facing hillside, connected via buried pipelines to the pier. The Navy also built a pier extending from Point Molate and developed a drum storage area and rail lines between the drum storage area and the pier. Subsequent to acquisition by the Navy, many of Winehaven's buildings were converted for use by the Navy, and others were demolished. Eleven buildings were constructed on site since acquisition by the Navy. Construction by the Navy included the development of work shops and facilities, paved storage areas, water treatment ponds, and various storage buildings. In the 1980s, the Navy initiated a

eucalyptus removal program for a portion of the eucalyptus grove. However, the cut stumps were neither removed nor sprayed, and they have since re-sprouted.

3.2 PHYSICAL FEATURES

NFD Point Molate occupies approximately 320 acres of sloping terrain and shoreline. Elevations range from sea level to 490 feet above mean sea level. The rocks of the Potrero Hills belong to the Jurassic Franciscan Formation and are part of the Mount Tamalpais massif. The ridge line is considered to be an escarpment resulting from uplifting of the San Pablo Fault, a branch of the Hayward Fault. The Potrero Hills are composed of shales, sandstones, and cherts.

Soils at NFD Point Molate consist primarily of Millsholm loam, 50 to 75 percent slopes (Loamy Mixed Thermic Lithic Xerochrept) with areas of urban land (developed or paved), and Orthents (USDA, 1977). The Millsholm series consists of well-drained soils that formed from interbedded shale and fine-grained sandstone. The surface texture of these soils ranges from a loam, silt loam to a light clay loam. Native soils vary in thickness from 10 to 20 inches in depth, underlain by shale or sandstone. The soils have been greatly altered by reshaping, grading, excavating, and filling.

The climate of Point Molate is subjected to a strong marine influence characterized by frequent morning and evening fog during the summer and strong prevailing winds through the Golden Gate. Precipitation falls primarily between the months of October and April, and the average annual rainfall is 14 to 24 inches (USDA, 1977). The average daily temperature is 59EF, and the average annual frost-free period is 250 to 300 days. Relative humidity is lowest in the fall and ranges from 50 percent during the day to 70 percent during the night (DON, 1986). The prevailing wind direction is from the northwest. Wind speed is less than 6 miles per hour more than 50 percent of the time and exceeds 12 miles per hour only 10 percent of the time (DON, 1986). The strongest winds are generally associated with winter storms.

3.3 VEGETATION COMMUNITIES

Natural plant communities occurring at Navy Fuel Supply Depot, Point Molate include northern coastal salt marsh, northern coastal bluff scrub, coastal terrace prairie, northern coastal scrub, Central Coast riparian scrub, and coastal freshwater marsh (Figure 2). Prominent nonnative habitats occurring on site include ruderal, nonnative annual grasslands, eucalyptus woodland, and nonnative scrub/shrubland. Intensively developed and maintained landscaped areas are not emphasized in this study.

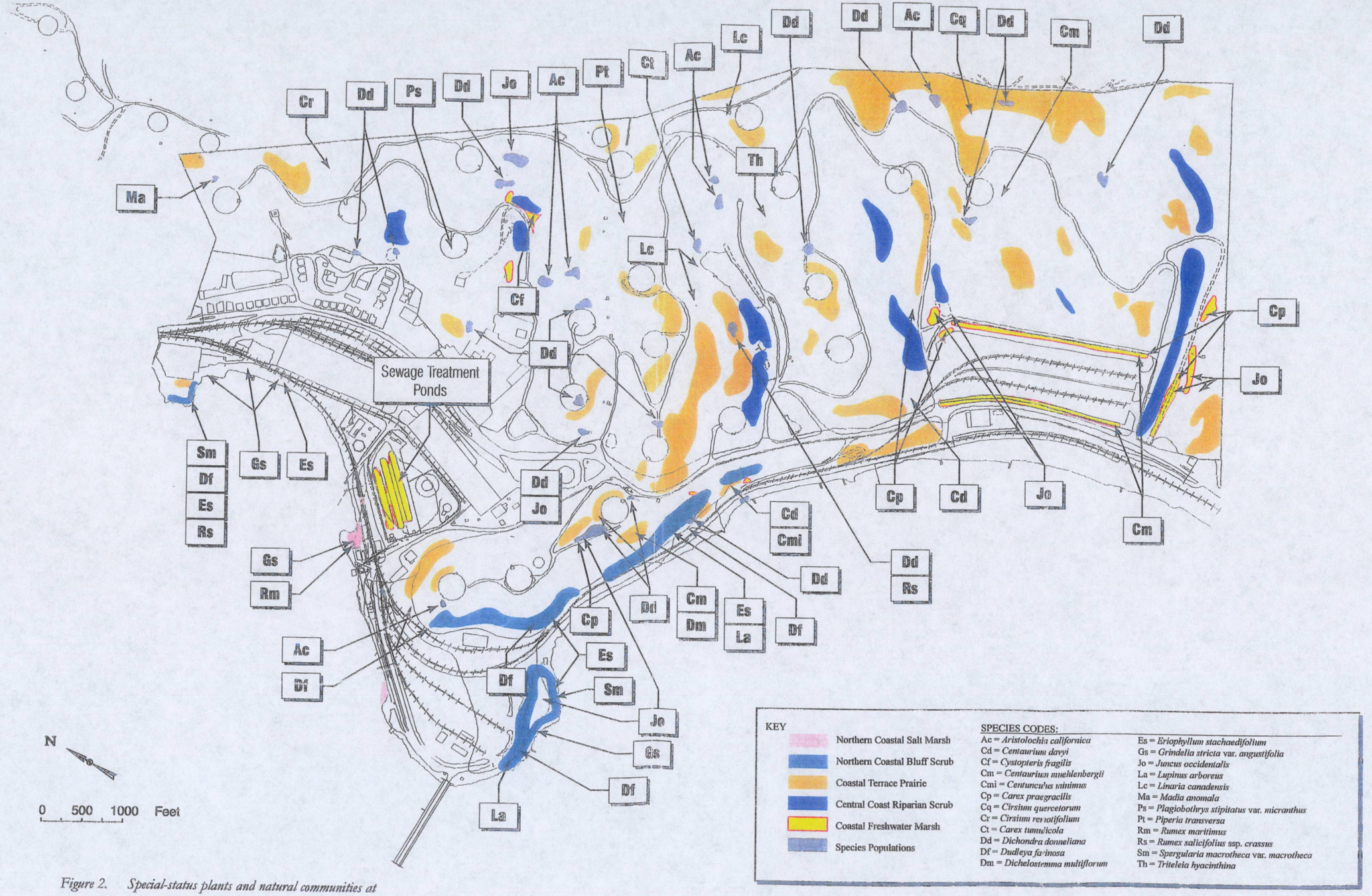

Figure 2. Special-status plants and natural communities at Navy Fuel Depot, Point Molate

The original vegetation of NFD Point Molate has been altered by past human activities. Grazing by livestock, alteration of the fire regime, development, planting of eucalyptus groves, and the spread of invasive exotic species have resulted in the removal of much of the herbaceous grasslands and coastal scrub that is presumed to have dominated the site prior to European settlement. Exotic species such as Tasmanian blue gum (*Eucalyptus globulus*), French broom (*Genista monspessulana*), sweet fennel (*Foeniculum vulgare*), Himalaya blackberry (*Rubus discolor*), and Scotch broom (*Cytisus scoparius*) are common. Poison oak (*Toxicodendron diversilobum*), while a native species, has also spread into natural plant communities.

NFD Point Molate supports examples of coastal terrace prairie and northern coastal bluff scrub habitats that are very uncommon in the East Bay. The native and nonnative plant communities within the study area are described below.

NORTHERN COASTAL SALT MARSH

Northern coastal salt marsh consists of highly productive, herbaceous, and shrub-like perennials up to 3 to 4 feet tall. Usually found along sheltered margins of bays, lagoons, and estuaries, this plant community develops a moderate to dense cover. Subject to continuously fluctuating salinity and water levels, northern coastal salt marsh is typically dominated by a low diversity of salt tolerant plants. Depending on topography, clear transitions in species composition are frequently evident as one progresses from the lower to middle to upper intertidal zones. Northern coastal salt marsh occurs extensively in the San Francisco Bay, Morro Bay, Elkhorn Slough, and Tomales Bay and extends from near Point Conception to the Oregon border.

Within the study area, there are only three, very poorly developed stands of northern coastal salt marsh. These are limited to the highly modified northern shoreline of Point Molate. The lower intertidal zone of this plant community is dominated by California cordgrass (*Spartina foliosa*). Characteristic native species of the mid and upper intertidal zones include pickleweed (*Salicornia virginica*), marsh gumplant (*Grindelia stricta* var. *angustifolia*), salty dodder (*Cuscuta salina* var. *major*), and saltgrass (*Distichlis spicata*). Characteristic nonnative species include spearscale (*Atriplex triangularis*), Hottentot fig (*Carpobrotus edulis*), New Zealand spinach (*Tetragonia tetragonioides*), and sea-rocket (*Cakile maritima*).

Onsite, northern coastal salt marsh conforms to the cordgrass series and pickleweed series as described in Sawyer and Keeler-Wolf (1995) and would be classified as estuarine intertidal emergent persistent wetland following Cowardin *et al.* (1979).

NORTHERN COASTAL BLUFF SCRUB

Northern coastal bluff scrub is comprised of low, often prostrate scrub species 2 to 20 inches high and forming continuous or scattered mats. It is made up of dwarf shrubs, herbaceous perennials and annuals and, occasionally, succulent species. This plant community develops on exposed coastal bluffs above the high tide line and is subject to strong winds and salt spray. Soils are usually rocky and poorly developed. Northern coastal bluff scrub occurs at localized sites between Point Conception and Point Mendocino. It rarely extends inland much beyond the bluff face, where it typically intergrades with coastal prairie and northern coastal scrub. This plant community is relatively uncommon in the East Bay region.

Within the study area, northern coastal bluff scrub consists of a very narrow band of mostly disturbed vegetation along the shoreline on the exposed sandstone bluffs just north of the Winehaven warehouse (Building 1), on the south-facing bluff adjacent to drum storage area 1 and on the steep, southwest-facing slopes below Tanks 1 to 3. Characteristic native species detected in this plant community on site include bluff lettuce (*Dudleya farinosa*), seaside woolly-sunflower (*Eriophyllum stachaedifolium*), large-flowered sand-spurrey (*Spergularia macrotheca* var. *macrotheca*), hirsute grindelia (*Grindelia hirsutula* var. *hirsutula*), California sagebrush (*Artemisia californica*), toyon (*Heteromeles arbutifolia*), poison oak, coyote brush (*Baccharis pilularis*), phacelia (*Phacelia californica*), coast buckwheat (*Eriogonum nudum* var. *auriculatum*), and bush monkey-flower (*Mimulus aurantiacus*).

Onsite, this vegetation type most closely conforms to the California sagebrush series as classified by Sawyer and Keeler-Wolf (1995) and would be classified as an upland following Cowardin *et al.* (1979).

COASTAL TERRACE PRAIRIE

Coastal terrace prairie is typically comprised of a dense, tall, grassland dominated by both sod- and tussock-forming native perennial grasses. It is naturally patchy in occurrence and variable in composition, reflecting differences in slope aspect, soil texture, and moisture availability. This vegetation community occurs on sandy loam soils of marine terraces near the coast and is restricted to cooler, wetter sites within the zone of fog incursion. Coastal terrace prairie differs from valley/foothill needlegrass grassland, in that annual species are less important in the community. Coastal terrace prairie is distributed from Santa Cruz County to Oregon (Holland, 1986). Its range closely matches that of northern coastal scrub.(Holland and Keil, 1990), with which it is generally associated.

Within the study area, coastal terrace prairie consists of dense and extensive stands of perennial, native grasses including purple needlegrass (*Nassella pulchra*), foothill needlegrass (*Nassella lepida*), California oatgrass (*Danthonia californica* var. *californica*),

California fescue (*Festuca californica*), red fescue (*Festuca rubra*), Idaho fescue (*Festuca idahoensis*), blue wildrye (*Elymus glaucus* var. *glaucus* and *E. g.* var. *jepsonii*), big squirreltail (*Elymus multisetus*), and Torrey melic (*Melica torreyana*). Also common are such native wildflowers as California aster (*Aster chilensis*), narrow-leaved mule ears (*Wyethia angustifolia*), morning-glory (*Calystegia purpurata* ssp.). *purpurata*), summer lupine (*Lupinus formosus* var. *formosus*), coyote mint (*Monardella villosa* ssp. *villosa*), checker mallow (*Sidalcea malvaeflora* ssp. *malvaeflora*), California poppy (*Eschscholzia californica*), wavy-leaf soap plant (*Chloragalum pomeridianum* var. *pomeridianum*), owl's clover (*Castilleja densiflora* ssp. *densiflora*), California blue-eyed grass (*Sisyrinchium bellum*), harvest brodiaea (*Brodiaea elegans*), Ithuriel's spear (*Triteleia laxa*), and blue dicks (*Dichelostemma capitatum* ssp. *capitatum*). Also present are the regionally uncommon species dichondra (*Dichondra donelliana*) and wild hyacinth (*Dichelostemma multiflorum*) (Section 4.4). At Point Molate, coastal terrace prairie is important because of its rarity in the East Bay and the high concentration and diversity of native species it supports.

Many areas of coastal terrace prairie support shrubby "islands" dominated by toyon, which appears to have invaded the grasslands, possibly as a result of changes in the grazing regime. In 1982, the toyons were estimated to be 35 to 40 years old (Havlik, 1982). These stands have facilitated the establishment of other shrub and herbaceous species characteristic of northern coastal scrub (see discussion below).

Onsite, coastal terrace prairie most closely conforms to the California oatgrass series as described by Sawyer and Keeler-Wolf (1995) and would be classified as an upland following Cowardin *et al.* (1979).

NORTHERN (FRANCISCAN) COASTAL SCRUB

Northern coastal scrub consists of a dense cover of low shrubs up to 6 feet high with a well-developed herbaceous or low woody understory. Northern coastal scrub is frequently interspersed with coastal terrace prairie grassland, and is most extensive on windy, exposed sites with shallow, rocky soils. This vegetation community is distributed in a discontinuous strip from southern Oregon to Point Sur, Monterey County, within the immediate coastal zone and at elevations up to 1,500 feet (Holland, 1986; Holland and Keil, 1990).

Within the study area, northern coastal scrub occurs in well-developed stands on south- and southeast-facing slopes in the southern half of the study area. Onsite, this plant community intergrades with coastal terrace prairie, mixed woodland, eucalyptus woodland, and mixed nonnative scrub/shrubland. Characteristic species present include sticky monkey-flower, California sagebrush, coyote brush, poison oak, toyon, coast buckwheat, coffeeberry (*Rhamnus californica* ssp. *californica*), western bracken fern (*Pteridium aquilinum* var. *pubescens*), cow parsnip (*Heracleum lanatum*), golden-yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), blue elderberry (*Sambucus*

mexicana), California broom (*Lotus scoparius*), oso berry (*Oemleria cerasiformis*), and bee plant (*Scrophularia californica*).

On north-facing slopes and ravine sides, northern coastal scrub takes on more of a woodland character, supporting an overstory of toyon and a sparse understory with such native species as hillside gooseberry (*Ribes californicum* var. *californicum*), Dutchman's pipevine (*Aristolochia californica*), rigid hedge nettle (*Stachys ajugoides* var. *rigida*), bedstraw (*Galium aparine*), miner's lettuce (*Claytonia perfoliata* ssp. *perfoliata*), elegant rein-orchid (*Piperia elegans*), California man-root (*Marah fabaceus*), maidenhair fern (*Adiantum jordanii*), and polypody (*Polypodium calirhiza*). Very few individuals of coast live oak (*Quercus agrifolia*), California buckeye (*Aesculus californica*), and California bay (*Umbellularia californica*) are found in these wetter sites.

Non-native exotic plants that have become naturalized in this community include Tasmanian blue gum, French broom, Scotch broom, Arizona cypress (*Cupressus arizonica* ssp. *arizonica*), horsetail casuarina (*Casuarina equisetifolia*), blackwood acacia (*Acacia melanoxylon*), and cotoneaster (*Cotoneaster* spp.).

Within the study area, northern coastal scrub mostly closely corresponds to the California sagebrush series as classified by Sawyer and Keeler-Wolf (1995) and would be classified as an upland following Cowardin *et al.* (1979).

CENTRAL COAST RIPARIAN SCRUB

Central Coast riparian scrub typically consists of a scrubby, open to impenetrable, streamside thicket composed of any of several species of willows. This plant community occurs close to river channels and near the coast on fine-grained sand and gravel bars with a high water table. It is distributed along and at the mouths of most perennial and many intermittent streams of the South Coast Ranges, from the Bay Area to near Point Conception (Holland, 1986).

Within the study area, Central Coast riparian scrub is restricted to narrow drainages in the southern half of the study area. It has also formed small clumps around seeps and springs at several locations. Characteristic native species occurring on site include arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), California blackberry (*Rubus ursinus*), evergreen thornless blackberry (*Rubus ulmifolius* var. *inermis*), and poison oak.

On site, Central Coast riparian scrub conforms to the red willow and arroyo willow series as described in Sawyer and Keeler-Wolf (1995) and palustrine shrub-scrub wetland following Cowardin *et al.* (1979).

COASTAL FRESHWATER MARSH

Coastal freshwater marsh typically occurs in low-lying sites that are permanently flooded with freshwater and lack significant current. Coastal freshwater marsh is found on nutrient-rich mineral soils that are saturated for all or most of the year. This vegetation community is most extensive where surface flow is slow or stagnant or where the water table is so close to the surface as to saturate the soil from below. Coastal freshwater marsh is distributed along the coast and in coastal valleys near river mouths and around the margins of lakes, springs, and streams (Holland, 1986). This vegetation community characteristically forms a dense vegetative cover dominated by perennial, emergent monocots 1 to 15 feet high that reproduce by underground rhizomes.

Within the study area, coastal freshwater marsh consists of scattered patches in drainages, and around seeps and springs. The sewage treatment ponds at the north end of the base support a large area of freshwater marsh.

Characteristic native species occurring on site include Barbara's sedge (*Carex barbarae*) iris-leaf rush (*Juncus xiphioides*), common rush (*Juncus effusus* var. *pacificus*), umbrella sedge (*Cyperus eragrostis*), common large monkey-flower (*Mimulus guttatus*), low bulrush (*Scirpus cernuus*), meadow barley (*Hordeum brachyantherum* ssp. *brachyantherum*), and narrowleaf cattail (*Typha angustifolia*).

Onsite, this vegetation type does not conform to any particular series as classified by Sawyer and Keeler-Wolf (1995). It would be classified as a palustrine seasonally or permanently flooded wetland following Cowardin *et al.* (1979).

RUDERAL

Numerous areas on site have been severely disturbed by grading, paving, and construction activities. The native vegetation on these lands has been completely removed and, in some instances, replaced by ruderal (weedy) nonnative and native plant species. Weedy species commonly encountered include sweet fennel, black mustard (*Brassica nigra*), brome grasses (*Bromus* spp.), Italian thistle (*Carduus pycnocephalus*), bristly ox-tongue (*Picris echioides*), ruby sand-spurrey (*Spergularia rubra*), horse weed (*Conyza bilboana*), wild oats (*Avena* spp.), and filaree (*Erodium* spp.). Ruderal habitat is not specifically described by Sawyer and Keeler-Wolf (1995) and would be classified as upland following Cowardin *et al.* (1979).

NONNATIVE ANNUAL GRASSLAND

Nonnative annual grassland is generally found in open areas in valleys and foothills throughout coastal and interior California (Holland, 1986). It typically occurs on soils consisting of fine-textured loams or clays that are somewhat poorly drained. This vegetation type is dominated by nonnative annual grasses and weedy annual and perennial forbs, primarily of Mediterranean origin, which have replaced native perennial grasslands and scrub as a result of human disturbance. Scattered native wildflower species, representing remnants of the original vegetation may also be common. Onsite, nonnative annual grassland intergrades with coastal terrace prairie, northern coastal scrub, and all of the disturbed habitats dominated by nonnative species.

Characteristic nonnative annual grasses commonly found on site include wild oats, brome grasses, wild barley (*Hordeum* spp.), quaking grass (*Briza* spp.), Italian ryegrass (*Lolium multiflorum*), and fescue (*Vulpia* spp.). Common nonnative forbs include yellow star thistle (*Centaurea solstitialis*), field bindweed (*Convovulus arvensis*), crane's-bill (*Geranium dissectum*), sheep sorrel (*Rumex acetosella*), bur-clover (*Medicago polymorpha*), black mustard, and filaree. Nonnative annual grassland conforms to the California annual grassland series, as described in Sawyer and Keeler-Wolf (1995), and would be classified as an upland, following Cowardin *et al.* (1979).

EUCALYPTUS WOODLAND

This nonnative plant community has become naturalized in California since eucalyptus trees were first brought to the state in the mid 1880s. Numerous species of the genus were imported for their horticultural interest and their potential utility as a fast-growing hardwood. Groves of eucalyptus were first planted in the vicinity of Berkeley and later throughout the Central Coast and into southern California. Because climatic conditions in the western half of the state are very similar to the range of many of the imported species of eucalyptus in Australia, the planted groves have persisted and spread without cultivation. It is estimated that there are between 600 and 800 species of *Eucalyptus*, about 18 of which have become fairly widespread in California. The most common and widely grown species is Tasmanian blue gum.

Within the study area, eucalyptus woodland is dominated by Tasmanian blue gum trees 60 to 80 feet in height. Eucalyptus groves were first established on site around 1908 during the construction of Winehaven. Eucalyptus are the dominant tree feature at NFD Point Molate, forming a dense forest in the northern portion of the study area, principally adjacent to the housing and on the north side of the promontory adjacent to Tanks 1, 2, and 3. Canopy coverage ranges from around 30 to 90 percent. The understory varies from ruderal, nonnative herbs and shrubs to relicts of the northern coastal scrub and coastal terrace prairie communities. Native plant species relatively common in the eucalyptus understory include toyon,

polypody, California man-root, blue elderberry, poison oak, California blackberry, rigid hedge nettle, Pacific sanicle (*Sanicula crassicaulis*), California honeysuckle (*Lonicera hispidula* var. *vacillans*), and creeping ryegrass (*Leymus triticoides*).

Eucalyptus woodland is not a native plant community and is therefore not described in Sawyer and Keeler-Wolf (1995); it would be classified as an upland following Cowardin *et al.* (1979).

NONNATIVE SCRUB/SHRUBLAND

Nonnative scrub/shrubland consists of nonnative garden escapees that have become naturalized, usually on disturbed sites. This plant community is frequently adjacent to such disturbed habitats as ruderal and eucalyptus woodland but also intergrades with northern coastal scrub. It is dominated by French broom. Also common are Scotch broom, sweet fennel, blackwood acacia, cotoneaster, green wattle (*Acacia decurrens*), and black locust (*Robinia pseudo-acacia*).

Nonnative scrub/shrubland is not a native plant community and is therefore not described in Sawyer and Keeler-Wolf (1995); it would be classified as an upland following Cowardin *et al.* (1979).

3.4 SPECIAL-STATUS PLANT TAXA

Certain plants are designated as "special-status" taxa due to their overall rarity, endangerment, restricted distribution, and/or unique habitat requirements. In general, it is a combination of these factors that leads to the designation of a species as sensitive. The federal Endangered Species Act (ESA), enacted by Congress in 1973, outlines the procedures whereby species are listed as endangered or threatened and establishes a program for the conservation of such species and the habitats in which they occur. Many individual states have enacted their own listing procedures to provide for the protection of additional locally sensitive biological resources. The California Endangered Species Act of 1984 amends the California Fish and Game Code to protect species deemed to be locally endangered and essentially expands the number of species protected under the ESA.

Special-status plant species include those listed as endangered, threatened, rare, or as candidates for listing by the U.S. Fish and Wildlife Service (USFWS, 1995, 1996a, b), the California Department of Fish and Game (CDFG, 1998a, b), and the California Native Plant Society (CNPS) (Skinner and Pavlik, 1997). The CNPS listing is sanctioned by the CDFG and serves essentially as their list of "candidate" plant species.

Based on a review of the California Natural Diversity Database (CNDDB) (CDFG 1997c) and Skinner and Pavlik (1997), a total of 63 special-status plant taxa were determined to have a potential for occurring in the project vicinity. A summary of the status, habitat affinities, reported localities in the project area, blooming period, and potential for occurrence on site for each of the target plant species is presented in Table 1.

Of the 63 target special-status plant taxa searched for, only one, marsh gumplant (*Grindelia stricta* var. *angustifolia*), has been located. This relatively common saltmarsh species occurs in large numbers along the immediate shoreline of the site. Marsh gumplant is discussed in more detail, below. The potential for occurrence of the remaining 62 target taxa is considered to be low to none due to a lack of suitable habitat or the fact that they would have been detectable during the surveys but were not observed.

MARSH GUMPLANT

Marsh gumplant (*Grindelia stricta* var. *angustifolia*) is a perennial in the sunflower family. It is a prostrate to erect sub-shrub reaching 5 feet in height. It has reddish-brown stems and glandular sticky oblong leaves up to 6 inches in length. It produces numerous inflorescences with bright yellow ray flowers from August through October and occurs infrequently in coastal salt marshes throughout the Central Coast from Napa and Sonoma counties to Monterey County. Marsh gumplant is on the CNPS List 4; it has no status as a state or federally protected species.

At NFD Point Molate, marsh gumplant occurs in scattered populations along the immediate shoreline (Figure 2). It is estimated that as many as 400 individuals of marsh gumplant occur within the study area.

TABLE 1
POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES AT NAVAL FUEL DEPOT, POINT MOLATE

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Apiaceae					
Lilaeopsis masonii Mason's lilaeopsis	Federal State CNPS	SC CR 1B:2-2-3	Intertidal brackish and freshwater marshes along streambanks. Recorded in the San Joaquin and Sacramento River Delta and lower Napa River channel near Mare Island.	April-Oct Perennial herb	None: no suitable habitat present onsite.
Sanicula maritima adobe sanicle	Federal State CNPS	C2 CR 1B:3-3-3	Coastal prairie, grassy, open, wet meadows and ravines near the coast, on clay or serpentinite. Recorded in San Luis Obispo County. Presumed extirpated in Alameda and San Francisco Counties.	April--May Perennial herb	None: marginally suitable habitat present onsite. Would have been detectable.
Sanicula saxatilis rock sanicle	Federal State CNPS	SC CR 1B:3-2-3	Broadleaf upland forests, chaparral, Valley/foothill grassland, on bedrock outcrops and talus slopes. Restricted to Contra Costa and Santa Clara counties. Nearest population at Mt. Diablo.	April-May Perennial herb	None: no suitable habitat present onsite.
Asteraceae					
Aster lentus Suisun Marsh aster	Federal State CNPS	SC CEQA 1B:2-2-3	Freshwater and brackish marshes. Known from the Napa River and San Joaquin/Sacramento River Delta. Nearest population at Pittsburg	May-Nov Perennial herb	None: no suitable habitat present onsite. Would have been detectable.
Blepharizonia plumosa ssp. *plumosa* big tarplant	Federal State CNPS	none CEQA 1B:3-3-3	Valley/foothill grasslands, on dry sites. Extant in Alameda and possibly Contra Costa counties. Believed extinct in San Joaquin, Stanislaus and Solano counties. Nearest population at Antioch.	July-Oct Annual herb	None: suitable habitat present onsite. Would have been detectable.
Eriophylum jepsonii Jepson's woolly sunflower	Federal State CNPS	none CEQA? 4:1-1-3	Chaparral, cismontane woodland, coastal scrub, sometimes on serpentinite. Known from Alameda, Contra Costa, San Benito, Santa Clara, Kern, Stanislaus and Ventura Counties. Nearest populations at Mt. Diablo.	April-June Perennial herb	None: marginally suitable habitat present onsite. Would have been detectable.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Grindelia stricta var. *angustifolia* marsh gumplant	Federal State CNPS	none CEQA? 4:1-1-3	Coastal saltmarsh. Found from Monterey County to the San Francisco Bay. Relatively common in vicinity of site.	Aug-Oct Perennial herb	Present: scattered individuals detected along shore line (see text).
Helianthella castanea Diablo helianthella	Federal State CNPS	SC CEQA 1B:3-2-3	Broadleaf upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and Valley/foothill grassland. Occurs in Alameda, Contra Costa and San Mateo counties; presumed extirpated in Marin and San Francisco counties. Nearest populations at Pinole Peak and El Sobrante Ridge.	April-June Perennial herb	None: suitable habitat present onsite. Would have been detectable.
Hemizonia parryi ssp. *congdonii* Congdon's tarplant	Federal State CNPS	C CEQA 1B:3-3-3	Valley/foothill grasslands on alkaline soils. Restricted to San Luis Obispo, Monterey, and possibly Santa Clara counties; presumed extirpated in Alameda, Contra Costa, Santa Cruz and Solano counties.	June-Nov Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Holocarpha macradenia Santa Cruz tarplant	Federal State CNPS	C CE 1B:2-3-3	Coastal prairie, Valley/foothill grassland, often on heavy clay soils. Known from Contra Costa, Monterey and Santa Cruz counties; presumed extirpated in Alameda, Contra Costa and Marin counties. Several transplanted populations on San Pablo Ridge and Wildcat Canyon in western Contra Costa County.	June-Oct Annual herb	Low: marginally suitable habitat present onsite. Would have been detectable.
Isocoma arguta Carquinez goldenbush	Federal State CNPS	SC CEQA 1B:3-3-3	Valley/foothill grasslands, on alkaline sites. Restricted to Contra Costa and Solano counties in the vicinity of the Carquinez Straits.	Aug-Dec Perennial shrub	None: no suitable habitat present onsite. Would have been detectable.
Lasthenia conjugens Contra Costa goldfields	Federal State CNPS	FPE CEQA 1B:3-3-3	Mesic sites in Valley/foothill grassland, vernal pools. Restricted to Napa and Solano counties; presumed extirpated in Alameda, Contra Costa, Mendocino, Santa Barbara and Santa Clara counties. Nearest historic population recorded at Concord.	Mar-June Annual herb	Low: suitable habitat present onsite. Would have been detectable. Anectdotal sighting of genus unconfirmed.
Layia carnosa beach layia	Federal State CNPS	FE CE 1B:3-3-3	Coastal dunes. Found from Humboldt to Monterey counties; presumed extinct in San Francisco and Santa Barbara counties. Nearest historic populations recorded from San Francisco	May-July Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Madia radiata showy madia	Federal State CNPS	none CEQA 1B:2-3-3	Valley/foothill grasslands below 250 feet, and cismontane woodland. Occurs throughout the Central Coast and Central Valley. Presumed extirpated in Contra Costa County. Nearest historic population recored at Antioch.	March-May Annual herb	None: suitable habitat present onsite. Would have been detectable.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Micropus amphibolus Mt. Diablo cottonweed	Federal State CNPS	none CEQA? 4:1-1-3	Broadleaf upland forest, cismontane woodland, Valley/foothill grass-land. Known from Lake to Santa Cruz counties, San Francisco Bay Area. Nearest populations at Wildcat Canyon.	April-May Annual herb	Low: suitable habitat present onsite. Would have been detectable. Easily overlooked.
Pentachaeta bellidiflora white-rayed pentachaeta	Federal State CNPS	FE CE 1B:3-3-3	Open dry rocky slopes, Valley/foothill grassland, often on serpentinite. Restricted to San Mateo County; presumed extirpated in Marin and Santa Cruz counties. Nearest historic population was on the San Quentin Peninsula.	March-May Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Senecio aphanactis rayless ragwort	Federal State CNPS	none CEQA 2:3-2-1	Coastal scrub and cismontane woodland on alkaline soils. Known from the South Coast, Central Coast, Central Valley and San Francisco Bay. Recorded on Mare Island in 1874.	Jan-April Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Boraginaceae					
Amsinckia grandiflora large-flowered fiddleneck	Federal State CNPS	FE CE 1B:3-3-3	Cismontane woodland, Valley/foothill grassland. Known from only three natural occurrences in Alameda, Contra Costa and San Joaquin counties. Nearest populations in vicinity of Livermore.	April-May Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Amsinckia lunaris bent-flowered fiddleneck	Federal State CNPS	none CEQA? 4:1-1-3	Open woods, Valley/foothill grasslands. Reported from the vicinity of the San Francisco Bay to Lake, Shasta and Siskiyou counties. Nearest population at San Pablo Reservoir.	Mar-June Annual herb	None: suitable habitat present onsite. Would have been detectable.
Cryptantha hooveri Hoover's cryptantha	Federal State CNPS	none CEQA? 4:1-2-3	Valley/foothill grassland, on sandy soils. Known from Alameda, Contra Costa, Madera, Merced, Stanislaus and San Joaquin counties. Nearest population at Antioch.	April-May Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Plagiobothrys glaber hairless popcorn-flower	Federal State CNPS	none CEQA 1A	Alkaline meadows and vernal coastal salt marshes. Presumed extinct; once occurred in Alameda, Merced, Marin, San Benito, and Santa Clara counties. Nearest historic population was at Manzanita, eastern Marin County.	April-May Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Brassicaceae					
Arabis blepharophylla coast rock cress	Federal State CNPS	none CEQA? 4:1-1-3	Coastal prairie, coastal scrub, rocky coastal bluffs, grassy slopes, broadleaf upland forest. Known from Santa Cruz to Sonoma and Contra Costa counties. Nearest populations at Red Rock Island off Point Richmond.	Feb-April Perennial herb	None: marginally suitable habitat present onsite. Would have been detectable.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Streptanthus albidus ssp. *peramoenus* most beautiful jewel-flower	Federal State CNPS	C CEQA 1B:2-2-3	Chaparral, cismontane woodland and Valley/foothill grasslands on serpentinite. Known from Alameda, Santa Clara and Contra Costa counties. Nearest population at Mt. Diablo.	Apr-June Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Streptanthus hispidus Mt. Diablo jewel-flower	Federal State CNPS	SC CEQA 1B:3-1-3	Chaparral and Valley/foothill grassland on serpentine rock outcrops. Restricted to Contra Costa County. Nearest population at Mt. Diablo.	Mar-June Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Streptanthus niger Tiburon jewel-flower	Federal State CNPS	FE CE	Valley/foothill grassland, on serpentinite. Known from only three occurrences in Marin County on the Tiburon Peninsula.	May-June Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Tropidocaprum capparideum caper-fruited tropidocarpum	Federal State CNPS	SC CEQA 1A	Valley/foothill grasslands (alkaline hills). Known historically from Alameda, Contra Costa, Glenn, Monterey, Santa Clara and San Joaquin counties; presumed extinct. Last seen in 1957. Nearest historic populations recorded from Byron.	Mar-Apr Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Campanulaceae					
Downingia pusilla dwarf downingia	Federal State CNPS	none CEQA 2:1-2-1	Mesic sites in Valley/foothill grassland and vernal pools. Occurs from Sonoma and Napa counties through the Sacramento Valley and Sierra foothills. Nearest historic population at Sears Point.	Mar-May Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Chenopodiaceae					
Atriplex cordulata heartscale	Federal State CNPS	SC CEQA 1B:2-2-3	Chenopod scrub, Valley/foothill grassland, on somewhat alkaline or saline hard packed soils. Recorded from Alameda County throughout the Central Valley from Glenn to Kern counties. Presumed extirpated in Contra Costa and San Joaquin counties. Nearest population at Springtown near Livermore.	May-Oct Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Atriplex coronata var. *coronata* crownscale	Federal State CNPS	none CEQA? 4:1-2-3	Chenopod scrub, Valley/foothill grassland on alkaline soils. Known from the northern San Joaquin Valley, Central Coast, and eastern San Francisco Bay. Nearest population at Marsh Creek.	Apr-Oct Annual herb	None: no suitable habitat present onsite. Would have been detectable.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Atriplex depressa brittlescale	Federal State CNPS	none CEQA 1B:2-2-3	Chenopod scrub, playas and Valley/foothill grassland on alkaline and clay soils. Occurs from Solano County throughout the Sacramento and San Joaquin Valleys. Presumed extinct in Stanislaus County. Nearest population near Livermore.	May-Oct Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Atriplex joaquiniana San Joaquin spearscale	Federal State CNPS	SC CEQA 1B:2-2-3	Chenopod scrub, Valley/foothill grassland and alkali meadows. Occursfrom Solano County throughout the Sacramentoand San Joaquinvalleys. Presumed extinct in Santa Clara, San Joaquin and Tulare counties. Nearest populations near Livermore.	April-Sept Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Suaeda californica California suaeda	Federal State CNPS	FE CEQA 1B:3-3-3	Coastal salt marshes. Extirpated from San Francisco, Alameda, Santa Clara counties. Restricted to Morro Bay, San Luis Obispo County. Believed extirpated in Alameda and Santa Clara Counties.	July-Oct shrub (evergreen)	None: marginally suitable habitat present onsite. Would have been detectable.
Convolulaceae					
Convolvulus simulans small-flowered morning-glory	Federal State CNPS	none CEQA? 4:1-2-2	Chaparral (openings), coastal scrub, Valley/foothill grassland, in clay and serpentine seeps. Known from the Bay Area and San Joaquin Valley, Central Coast and Channel Islands to San Diego County. Nearest population at Antioch.	Mar-June Annual herb	None: suitable habitat present onsite. Would have been detectable.
Cyperaceae					
Carex comosa bristly sedge	Federal State CNPS	none CEQA 2:3-3-1	Marshes and swamps, lake margins. Believed extirpated in San Francisco, San Bernardino and Santa Cruz counties. Extant in Contra Costa, Lake, Shasta, San Joaquin and Sonoma counties.	May-Sept. Perennial herb (rhizomatous)	None: suitable habitat present onsite. Would have been detectable.
Eleocharis parvula small spikerush	Federal State CNPS	none CEQA? 4:1-1-1	Wet, generally saline flats, coastal salt marsh. Recorded from Orange to Humboldt counties. Nearest population at Antioch.	June-Sept Perennial herb	None: marginally suitable habitat present. Would have been detectable.
Ericaceae					
Arctostaphylos pallida pallid manzanita	Federal State CNPS	PT CE 1B:3-3-3	Broadleaved upland forest, closed cone coniferous forest, cismontane woodland, chaparral and coastal scrub, on siliceous shale, sandy and gravelly soils on uplifted marine terraces. Restricted to Alameda and Contra Costa counties. Nearest recorded populations on El Sobrante Ridge.	Dec-Mar. Evergreen shrub	None: marginally suitable habitat present. Would have been detectable.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Fabaceae					
Astragalus tener var. *tener* alkali milk-vetch	Federal State CNPS	none CEQA 1B:3-2-3	Playas, Valley/foothill grasslands, on adobe clay and alkaline vernal pools. Extant in Merced, Solano and Yolo counties. Extrpated throughout the Bay Area and San Joaquin Valley. Nearest historic population recorded from San Leandro.	March-June Annual herb	None: suitable habitat present onsite. Would have been detectable.
Lathyrus jepsonii var. *jepsonii* Delta tule pea	Federal State CNPS	SC CEQA 1B:2-2-3	Freshwater and brackish marshes. Occurs throughout the Sacramento-San Joaquin River delta, San Francisco Bay and Central Valley. Nearest population at Martinez.	May-Sept. Perennial herb	None: no suitable habitat present onsite. Would have been detectable.
Trifolium amoenum showy indian clover	Federal State CNPS	FPE CEQA 1B:3-3-3	Valley/foothill grasslands, in sunny open sites, sometimes on serpentinite. Rediscovered in Sonoma County in 1993, believed extirpated in Alameda, Mendocino, Marin, Napa, Santa Clara and Solano counties. Nearest historic population was at Corte Madera, Contra Costa County.	April-June Annual herb	None: suitable habitat present onsite. Would have been detectable.
Liliaceae					
Calochortus pulchellus Mt. Diablo fairy-lantern	Federal State CNPS	none CEQA 1B:2-2-3	Chaparral, cismontane woodland, Valley/foothill grassland. Known from Contra Costa and possibly Solano counties. Nearest population at Las Trampas Ridge.	April-June Perennial herb (bulbiferous)	None: suitable habitat present onsite. Would have been detectable.
Calochortus tiburonensis Tiburon mariposa lily	Federal State CNPS	FT ST 1B:3-3-3	Valley/foothill grassland, on serpentinite. Known only from Ring Mountain Preserve, Tiburon, Marin County	Mar-June Perennial herb (bulbiferous)	None: no suitable habitat present onsite.
Calochortus umbellatus Oakland star-tulip	Federal State CNPS	none CEQA? 4:1-2-3	Broadleafed and upland forest, chaparral, lower montane coniferous forest, Valley/foothill grassland, often on serpentinite. Known from Alameda, Contra Costa, Marin, Santa Clara and San Mateo counties. Nearest populations at El Sobrante.	Mar-April Perennial herb (bulbiferous)	None: marginally suitable habitat present onsite. Would have been detectable.
Fritillaria agrestis stinkbells	Federal State CNPS	none CEQA? 4:1-2-3	Chaparral, cismontane woodland, Valley/foothill grassland on clay or sometimes serpentinite. Fairly widespread fromSanta Barbara to Mendocino counties and east to the Sierra foothill counties. Nearest populations from vicinity of Livermore.	Mar-April Perennial herb (bulbiferous)	Low: marginally suitable habitat present onsite. Might not have been detectable. No unidentified fritillaries seen.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Fritillaria liliacea fragrant fritillary	Federal State CNPS	SC CEQA 1B:1-2-3	Coastal prairie, coastal scrub, Valley/foothill grassland near the coast, on clay or serpentinite. Known from throughout the Central Coast from Sonoma to Monterey counties and the San Francisco Bay Area. Nearest historic populations recorded near Point Richmond.	Feb-April Perennial herb (bulbiferous)	Low: marginally suitable habitat present onsite. Might not have been detectable. No unidentified fritillaries seen.
Linaceae					
Hesperolinon breweri Brewer's dwarf flax	Federal State CNPS	SC CEQA 1B:2-2-3	Chaparral, cismontane woodlands, Valley/foothill grassland, mostly on serpentinite. Found in Napa, Solano, and Contra Costa counties. Nearest populations at Tiburon Peninsula, Contra Costa County.	May-July Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Malvaceae					
Hibiscus lasiocarpus rose-mallow	Federal State CNPS	none CEQA 2:2-2-1	Freshwater marshes. Restricted to the Sacramento-San Joaquin River Delta.	June-Sept Perennial herb (rhizomatous)	None: no suitable habitat present onsite. Would have been detectable.
Orchidaceae					
Piperia michaelii Michael's rein orchid	Federal State CNPS	none CEQA? 4:1-2-3	Coastal bluff scrub, closed-cone coniferous forest, cismontane woodland and lower montane coniferous forest. Coastal from San Luis Obispo to Humboldt counties and the San Francisco Bay Area; expected in the Sierra foothills. Recorded from Point Molate (Lake, 1995).	May-Aug Perennial herb	Low: suitable habitat present. Would have been detecctable.
Papaveraceae					
Eschscholzia rhombipetala diamond-petaled California poppy	Federal State CNPS	SC CEQA 1A	Valley/foothill grassland on clay soils. Presumed extinct. Known historically from Alameda, Contra Costa, Colusa, San Luis Obispo and Stanislaus counties. Last seen in 1950. Nearest historic population recorded from the vicinity of Livermore.	Mar-April Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Polemoniaceae					
Linanthus acicularis bristly linanthus	Federal State CNPS	none CEQA? 4:1-2-3	Chaparral, cismontane woodland, coastal prairie and Valley/foothill grassland. Known from Humboldt County to San Mateo County on the coast to Fesno County. Nearest historic population at Oakland's Diamond Park.	April-July Annual herb	Low: suitable habitat present onsite. Would have been detectable.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Linanthus ambiguus serpentine linanthus	Federal State CNPS	none CEQA? 4:1-2-3	Cismontane woodland, coastal scrub, Valley/foothill grassland, usually on serpentinite. Known from the Bay Area and San Joaquin Valley. Nearest population at Berkeley.	Mar-April Annual herb	None: no suitable habitat present onsite. Would have been detectable.
Polygonaceae					
Chorizanthe pungens var. *pungens* Monterey spineflower	Federal State CNPS	FT CEQA 1B:2-2-3	Maritime chaparral, cismontane woodland, coastal dunes, coastal scrub and Valley/foothill grassland, on sandy sites. Restricted to Monterey and Santa Cruz counties. Nearest historic populations recorded from Alameda County.	April-June Annual herb	Low: marginally suitable habitat present onsite. Would have been detectable.
Eriogonum truncatum Mt. Diablo buckwheat	Federal State CNPS	none CEQA 1A	Chaparral, coastal scrub, Valley/foothill grassland on sandy soils. Presumed extinct; known historically from Alameda, Contra Costa and Solano counties. Last seen in 1940. Nearest historic population at Mt. Diablo.	April-Sept Annual herb	None: marginally suitable habitat present onsite. Would have been detectable.
Portulacaea					
Calandrinia breweri Brewer's calandrinia	Federal State CNPS	none CEQA? 4:1-2-2	Chaparral and coastal scrub on sandy or loamy, disturbed and burned sites. Known from Napa and Mendocino counties, throughout the Central Coast to San Diego. Nearest population at Carquinez Straits.	Mar-June Annual herb	None: suitable habitat present onsite. Would have been detectable.
Potamogetonaceae					
Potamogeton zosteriformis eel-grass pondweed	Federal State CNPS	none CEQA 2:2-2-1	Assorted freshwater marshes and swamps. Known from Contra Costa, Lake counties, Modoc, Lassen, and Shasta counties and Washington and Oregon. Nearest population at the Sacramento River Delta.	June-July Annual herb (aquatic)	None: marginally suitable habitat present onsite. Would have been detectable.
Primulaceae					
Androsace elongata ssp. *acuta* California androsace	Federal State CNPS	none CEQA? 4:1-2-2	Chaparral, cismontane woodland and coastal scrub. Known from the Bay Area and Central Coast to Siskyou and San Diego counties. Nearest population at Berkeley.	Mar-June Annual herb	Low: marginally suitable habitat present onsite. Would have been detectable.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Ranunculaceae					
Delphinium recurvatum recurved larkspur	Federal State CNPS	SC CEQA? 4:1-2-3	Chenopod scrub, cismontane woodland and Valley/ foothill grassland, in alkaline places. Restricted to the Central Valley from Colusa to Kern counties, San Luis Obispo. Nearest population at Byron.	Mar-May Perennial herb	None: no suitable habitat present onsite. Would have been detectable.
Ranunculus lobbii Lobb's aquatic buttercup	Federal State CNPS	none CEQA? 4:1-2-3	Mesic sites in cismontane woodland, Valley/foothill grassland, North Coast coniferous forest and vernal pools. Known from the San Francisco Bay Area to Mendocino and Napa counties. Nearest population at Wildcat Canyon Regional Park.	March-May Annual herb (aquatic)	None: marginally suitable habitat present onsite. Would have been detectable.
Scrophulari					
Castilleja affinis ssp. *neglecta* Tiburon indian paintbrush	Federal State CNPS	FE CT 1B:3-2-3	Valley and foothill grassland, rocky serpentine sites. Known from only 6 occurrences in Marin, Napa and Santa Clara counties. Nearest populations on Tiburon Peninsula, Contra Costa County.	April-June Perennial herb (hemiparasite)	None: no suitable habitat present onsite. Would have been detectable.
Cordylanthus maritimus ssp. *palustris* Pt. Reyes bird's-beak	Federal State CNPS	SC CEQA 1B:2-2-2	Coastal saltmarsh. Believed extant in Humboldt, Marin and Sonoma counties; presumed extinct in Alameda, Santa Clara and San Mateo counties. Nearest populations in San Rafael.	May-Oct Annual herb (hemiparasite)	None: marginally suitable habitat present onsite. Would have been detectable.
Cordylanthus mollis ssp. *mollis* soft bird's-beak	Federal State CNPS	FPE CR 1B:3-2-3	Coastal saltmarsh. Known from fewer than 10 locations in Contra Costa, Napa, and Solano counties. Extirpated in Marin and Sonoma counties. Nearest populations at Point Pinole.	July-Sept Annual herb (hemiparasite)	None: marginally suitable habitat present onsite. Would have been detectable.
Limosella subulata Delta mudwort	Federal State CNPS	none CEQA 2:2-3-1	Marshes and swamps, muddy or sandy intertidal flats in the Sacramento-San Joaquin river delta.	May-Aug Perennial herb (stolon-iferous)	None: no suitable habitat present onsite. Would have been detectable.
Triphysaria floribunda San Francisco owl's clover	Federal State CNPS	SC CEQA 1B:2-2-3	Coastal prairie, foothill/Valley grassland, on clay or serpentinite. Known from Marin, San Francisco and San Mateo counties. Nearest populations at Pt. Reyes and San Francisco.	April-May Annual herb	None: no suitable habitat present onsite. Would have been detectable.

Family *Scientific Name* Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/Life Form	Potential for Occurrence Onsite
Thymelaeaceae					
Dirca occidentalis western leatherwood	Federal State CNPS	none CEQA 1B:2-2-3	Broadleaf upland forest, closed cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland. Restricted to brushy slopes and mesic sites. Known from San Mateo to Sonoma counties. Nearest populations at El Sobrante and San Pablo Creek.	Jan-April Deciduous shrub	None: no suitable habitat present onsite. Would have been detectable.

[1]Explanation of Sensitivity Status Codes

AGENCIES

USFWS	=	U.S. Fish and Wildlife Service
CDFG	=	California Department of Fish and Game
CNPS	=	California Native Plant Society
BLM	=	Bureau of Land Management
USFS	=	U.S. Forest Service

CALIFORNIA NATIVE PLANT SOCIETY DESIGNATIONS

List 1:	Plants of highest priority
List 1A:	Plants presumed extinct in California
List 1B:	Plants rare and endangered in California and elsewhere
List 2:	Plants rare and endangered in California but more common elsewhere
List 3:	Plants about which additional data are needed
List 4:	Plants of limited distribution

CNPS R-E-D Codes

R (Rarity)

1	=	Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2	=	Occurrence confined to several populations or to one extended population.
3	=	Occurrence limited to one or a few highly restricted populations, or present in such low numbers that it is seldom reported.
?	=	More data are needed

E (Endangerment)

1	=	Not endangered
2	=	Endangered in a portion of its range
3	=	Endangered throughout its range
?	=	More data are needed

D (Distribution)

1	=	More or less widespread outside California
2	=	Rare outside California
3	=	Endemic to California
?	=	More data are needed

FEDERAL DESIGNATIONS

FE	=	listed as Endangered by the Federal Government
FT	=	listed as Threatened by the Federal Government
FPE	=	proposed as Endangered by the Federal Government
FTE	=	proposed as Threatened by the Federal Government
FSS	=	federal sensitive species, as listed by BLM and USFS
C[1]	=	Candidate; taxa for which USFWS has sufficient biological information to support a proposal to list as Endangered or Threatened).
SC[1]	=	Species of Concern
MB	=	migratory non-game birds of management concern to the USFWS; protected under the Migratory Bird Treaty Act.

[1]As of Feb. 28, 1996, all Category 1 candidate taxa are now regarded merely as Candidates. The USFWS ceased to maintains lists of Category 2 and Category 3 candidate taxa; Category 2 taxa are now regarded as Species of Concern.

CALIFORNIA DEPT. OF FISH AND GAME DESIGNATIONS

CE	=	Listed as Endangered by the State of California
CR	=	Listed as Rare by the State of California
CT	=	Listed as Threatened by the State of California
CPE	=	Proposed for listing as Endangered
SSC	=	California Species of Special Concern
*	=	taxa that are restricted in distribution, declining throughout their range, or associated with habitats that are declining in California.
CEQA	=	taxa which are considered to meet the criteria for listing as Endangered, Threatened or Rare by the CDFG; impacts to such taxa must be addressed in CEQA documents.
CEQA?	=	Taxa that might be locally significant; should be evaluated for consideration during preparation of CEQA documents, as recommended by the CDFG.

Note: currently, all CNPS list 1B and 2 taxa are considered "Special Plants" by the CDFG.

3.5 OTHER BOTANICAL RESOURCES

Botanically interesting taxa detected at NFD Point Molate are those species that are uncommon in Contra Costa and Alameda Counties (Lake, 1995) or that have a unique role in the plant community. Some of these species have a closer affinity to plant communities of Marin County than those of Contra Costa County and most likely represent remnants of earlier geologic eras when climatic conditions were very different than the present day. A brief discussion of each these taxa is presented below.

DUTCHMAN'S PIPEVINE

Dutchman's pipevine (*Aristolochia californica*) is a unique vine belonging to its own family (Aristolochiaceae). It produces a tubular, U-shaped, purplish calyx that functions as its flower. Flowers develop from January through April and they are pollinated by fungus gnats. Dutchman's pipevine occurs along stream sides, in woodlands, and in chaparral, and it is distributed from northern California to the South Coast Ranges and from the San Francisco Bay to the Sacramento Valley and northern and central Sierra foothills. In the East Bay, Dutchman's pipevine is restricted to small populations at approximately 12 to 14 locations. It is on the CNPS East Bay Chapter's rank "B" list due to the limited number and small size of the populations in the East Bay (Lake, 1995). Within the study area, six populations of the species were located (Figure 2). Dutchman's pipevine is the larval host plant for the pipevine swallowtail butterfly (*Battus philenor*).

DEER-BED SEDGE

Deer-bed sedge (*Carex praegracilis*) is a clumping to loosely caespitose perennial in the sedge family (Cyperaceae). It develops culms to 2.5' high originating from long-creeping rootstocks. It produces narrow, flat to "V"-shaped leaves less than 1/4" wide and usually shorter than the culms. The inflorescence consists of aggregated spikelets forming a dense head 1/2 to 2" long. It occurs in moist places in coastal to interior California. In the East Bay, deer-bed sedge has been recorded at only five locations including Point Molate, the East Bay Hills, and the Mt. Hamilton Range. It is on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, six populations of the species were located (Figure 2).

FOOTHILL SEDGE

Foothill sedge (*Carex tumulicola*) is a short-rhizomed perennial in the sedge family (Cyperaceae). It develops erect to spreading culms up to 2.5' high and flat to folded leaves less than 1/4" wide. The inflorescence is up to 2" long, open and flexible, and consists of several to numerous spikelets. It occurs in meadows, coastal prairie, and the grassy slopes of woodlands from the Coast Ranges to Del Norte County, and the Sierra Nevada from Madera County to Tuolumne. In the East Bay, foothill sedge has been recorded in eight locations throughout the East Bay Hills, being restricted primarily to the western part of Contra Costa and Alameda counties and the Mt. Hamilton Range. It has not previously been recorded in the Potrero Hills. It is on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, a single population of foothill sedge is present down slope of F Road (Figure 2). Additional populations of this species may be present at NFD Point Molate.

DAVY'S CENTAURY

Davy's centaury (*Centaurium davyi*) is an erect, simple or branched annual in the gentian family (Gentianaceae). It is a delicate to stout plant, 5 to 15 inches tall with sessile, opposite, acute leaves 1/2 to 1" long. It produces an open, generally sparse panicle of small pink flowers, which appear from April through July. Davy's centaury has been recorded at 8 locations in the East Bay, including its type location at West Berkeley, as well as the Potrero Hills, other parts of western Contra Costa and Alameda counties, and the Mt. Hamilton Range. It is on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, Davy's centaury was detected near the north end of the drum storage area, and on vernally moist flats north of Burma Road, west of its intersection with Garden Road (Figure 2).

CENTAURY

Centaury (*Centaurium muehlenbergii*) is an erect, simple or branched annual in the gentian family (Gentianaceae). It is a delicate to stout plant, 5 to 15 inches tall with sessile, opposite, acute leaves 1/2 to 1" long. It produces a loose, more-or-less flat-topped panicle of small pink flowers, which appear from June through August. Centaury has been recorded at 12 locations throughout the East Bay, including the Potrero Hills, western Contra Costa and Alameda counties, near Mt. Diablo, the Mt. Hamilton Range, and near the San Joaquin/Sacramento River Delta. It is on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, centaury was detected at two locations at the south end of the drum storage area, below Tank 17 and below Tank 3 (Figure 2).

CHAFFWEED

Chaffweed (*Centunculus minimus*), is a small annual of the primrose family (Primulaceae), with ascending stems 1.5 to 5 inches tall, cauline, sessile, entire leaves generally less than 1/4 inch long, and solitary, inconspicuous flowers borne in the axils of the leaves. The fruit is a circumscissile capsule bearing many tiny seeds. It prefers vernally moist habitats, and is circumboreal in its distribution. In California it is localized but widespread, found from the northern to the southern coast ranges, including the San Francisco Bay area. Chaffweed has been reported only once before in the East Bay, from a collection made in Berkeley in 1936, and is on the CNPS East Bay Chapter's rank "A-1" list, indicating that it is restricted to two or fewer known populations (Lake, 1995). Within the study area, it was found on moist flats north of Burma Road west of its intersection with Garden Road (Figure 2).

BROWNIE THISTLE

Brownie thistle (*Cirsium quercetorum*) is a generally low, herbaceous, perennial member of the sunflower family (Asteraceae). Stems are erect and from a few inches to a few feet in height. Spiny, coarse leaves form a basal rosette, and also are found along the stem and subtending the inflorescence of one to several clustered flower heads. In the East Bay, brownie thistle is generally found in grasslands on the coastal side of the Berkeley Hills, within the zone of summer fog incursion, and is reported from fewer than ten locations. It is included on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, it is found in grasslands rich in native species on the high slopes east of Tank 16, near the uppermost property boundary (Figure 2).

REMOTE-LEAVED THISTLE

Remote-leaved thistle (*Cirsium remotifolium*) is another spiny-leaved member of the sunflower family (Asteraceae), and may be biennial or perennial, with an erect, often branched stem from 12 to more than 60 inches in height. In California, it is found from the northern part of the central coast through the northwestern part of the state. In the East Bay it has been tentatively identified from only two locations, in Berkeley and in the Briones Hills, and is on the CNPS East Bay Chapter's rank "A-1" list, indicating that it is very restricted in its local distribution (Lake, 1995). Within the study area, a single population has been tentatively identified, based on a badly damaged specimen, on the high slopes near the northern corner of the property (Figure 2).

WILD HYACINTH

Wild hyacinth *(Dichelostemma multiflorum)* is a perennial, bulbiferous member of the lily family (Liliaceae). Its dense, umbel-like inflorescence of pink to blue-purple flowers is borne on a scape up to 30 inches or more in height, above long, narrow basal leaves. Found in California in the northwestern part of the state and in the northern Sierra Nevada, it grows in grassland, scrub, and open woods, and is considered to be uncommon in the northern and western San Francisco Bay area. Within the study area, a population of only a few plants was recorded from a grassy opening in coastal scrub, on a slope just west of Tank 3 (Figure 2). Wild hyacinth has not been previously reported from Alameda or Contra Costa Counties (Ertter, 1997).

FRAGILE FERN

Fragile fern (*Cystopteris fragilis*) is a delicate, low-growing, rhizomatous member of the wood fern family. It grows in moist soil of shady meadows, banks, streamsides and springs, and is found throughout most of California. It is of worldwide distribution. In the East Bay, it is reported from only seven locations, and is included on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, it is found at a single location, at the head of a perennial seep just west of G Road, at approximately 300 feet in elevation (Figure 2).

DICHONDRA

Dichondra (*Dichondra donelliana*) is a low growing perennial herb in the morning-glory family (Convolvulaceae). It has rounded, reniform leaves on long petioles growing from creeping rhizomes. It forms dense, local colonies on moist sites in grassland slopes in central and northern California. It produces inconspicuous whitish flowers from March through June. Dichondra has no formal state or federal status as a threatened or endangered species. Although it occurs infrequently throughout its range, the California Native Plant Society has rejected the addition of this species to its list of rare and endangered plants of California, considering it too common. Botanists are interested in tracking the distribution of dichondra in the event it may warrant consideration in the future. In the East Bay, dichondra is known only from the Potrero Hills. It is on the CNPS East Bay Chapter's rank "A-1" list, indicating that it is restricted to two or fewer known populations (Lake, 1995).

Dichondra occurs in 18 localized colonies within the study area (Figure 2). While the species is most often found in grasslands, it was also detected on disturbed soils on top of or adjacent to fuel tanks and in leaf litter under eucalyptus trees lacking other understory vegetation. The number of individual plants cannot easily be

determined because the species forms mats of interconnected stolons. Dichondra is fairly widespread in similar habitat throughout Marin County. Populations of dichondra at NFD Point Molate represent a local, unique botanical resource.

BLUFF LETTUCE

Bluff lettuce (*Dudleya farinosa*) is a perennial succulent in the stonecrop family (Crassulaceae). It produces a basal rosette of thick, green-to-white mealy leaves up to 2" long developing from a stout buried caudex. It occurs on sea bluffs and in coastal scrub from Los Angeles to southern Oregon. In the East Bay, bluff lettuce has been recorded from Point Molate and the East Bay Hills. It is on the CNPS East Bay Chapter's rank "A-2" list (Lake, 1995). Within the study area, bluff lettuce is relatively common on sandstone bluff faces along the immediate shoreline and in adjacent northern coastal bluff scrub habitat. It occurs on the point at the north end of Warehouse Road and on the bluffs above Building 69 and Building 89 (Figure 2).

JEPSON'S BLUE WILDRYE

Jepson's blue wildrye (*Elymus glaucus* ssp. *jepsonii*) is a perennial, often densely tufted member of the grass family (Poaceae). Its terminal, spike-like inflorescence is at the end of a culm from 2 to 5 feet tall. The sparsely to densely hairy leaf blade and sheath distinguish this subspecies from the locally more common blue wildrye (*Elymus glaucus* ssp. *glaucus*), which has glabrous or scabrous blades and sheaths. Onsite, Jepson's blue wildrye is found scattered in the grasslands of the upper slopes in the northeastern portion of the study area. Jepson's blue wildrye has not been previously reported from Alameda or Contra Costa Counties.

COAST BUCKWHEAT

Coast buckwheat (*Eriogonum nudum* var. *auriculatum*) is a low, woody, and densely leafy perennial in the buckwheat family (Polygonaceae). It produces oblanceolate to ovate leaves up to 2.5" long, densely white tomentose beneath and greenish above, and with strongly wavy leaf margins. Inflorescences are slender and glabrous, forming cymes of white to pink flowers from July through October. Coast buckwheat occurs on dry, rocky, and gravelly slopes in coastal strand, coastal scrub, chaparral, and grassland habitats of the Coast Ranges from Sonoma to Monterey counties. Until recently, this variety of coast buckwheat has been considered uncommon in the East Bay. Although it is currently on the CNPS East Bay Chapter's rank "B" list (Lake, 1995), its status has been reevaluated; it will not appear

on the next version of the CNPS East Bay Chapter's list (Lake, pers. comm.). Within the study area, coast buckwheat is ubiquitous in northern bluff scrub and is scattered throughout rockier portions of the grasslands and scrub margins.

SEASIDE WOOLLY-SUNFLOWER

Seaside woolly-sunflower (*Eriophyllum stachaedifolium*) is a shrubby, much-branched perennial in the sunflower family (Asteraceae). It produces decumbent to erect, tomentose stems up to 4' high. Leaves are linear to linear-oblanceolate, 1 to 2.5" long, entire or with few linear lobes, persistently tomentose below, and glabrous above. Inflorescences consist of 5 to 15 heads, each 1/4 to 1/2" high with 6 to 9 bright yellow ray flowers. Flowers appear from April to September. Seaside woolly sunflower occurs in coastal strand and coastal scrub habitats from the central to north coast. In the East Bay, it is restricted entirely to the vicinity of Point Richmond, occurring at Point Molate, Red Rock, and Brooks Island. It is on the CNPS East Bay Chapter's rank "A-1" list (Lake, 1995). Within the study area, seaside woolly-sunflower is relatively common throughout the northern bluff scrub habitat (Figure 2).

RED FESCUE

Red fescue (*Festuca rubra*) is a perennial bunch grass (family Poaceae) with short rhizomes. It produces bent or decumbent, loosely tufted culms with a reddish base and is up to 2.5' tall. Leaf blades are up to 12" long and less than 1/8" wide. Flowers stalks are open, ascending, and 2 to 4" long. Spikelets are 4 to 6 flowered with pale, often purplish glumes. Lemmas have a short awn 1/10" long. Flowers develop May through July. Red fescue occurs in meadows and moist places from sea level to 8,500 feet from Monterey and San Bernardino Mountains northward. In the East Bay, red fescue has been recorded from 10 locations throughout western and central Contra Costa County, western Alameda County, and the Mt. Hamilton Range. It is on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, red fescue occurs throughout the coastal terrace prairie habitat.

FRAGRANT EVERLASTING

Fragrant everlasting (*Gnaphalium canescens* ssp. *beneolens*) is a persistently woolly perennial in the sunflower family (Asteraceae). It produces erect, simple, tomentose stems with a yellowish-green cast up to 2.5' tall. Leaves are lance-linear, tomentose, up to 1/4" long. Inflorescences consist of a panicle of small cluster of heads at the

ends of branches. Flowers appear July through November. Fragrant everlasting occurs in dry places from the south coast to the North Coast Ranges and throughout the Bay Area. In the East Bay, it has been recorded at five general locations, including the East Bay Hills, the Altamont Hills, the Point Richmond area, Antioch, and western Alameda County. It is on the CNPS East Bay Chapter's rank "A-2" list (Lake, 1995). Within the study area, fragrant everlasting is relatively common, being scattered throughout the grasslands and scrub margins.

CONGESTED TOAD RUSH

Congested toad rush (*Juncus bufonius* var. *congestus*) is a low-growing annual of the rush family. The narrow, branched stem is generally from 2 to 12 inches tall, with the inconspicuous flowers crowded at the ends of frequently coiled branch tips. It prefers moist habitats, and is generally found in low flats and depressions which are wet in early spring. Congested toad rush is reported from only 5 locations in the East Bay, including Mount Diablo, Mission Peak, San Leandro, Oakland and Berkeley. It is on the CNPS East Bay Chapter's rank "A-2" list (Lake, 1995). Within the study area, congested toad rush is found scattered in moist grasslands.

SLENDER RUSH

Slender rush (*Juncus occidentalis*) is a clumping, stiffly erect perennial in the rush family (Juncaceae). It produces narrow, flat, grass-like basal leaves half as long as the stem and less than 1/16" wide. Inflorescences are sub-capitate to open with solitary brownish to greenish flowers. Flowers appear March through July. Slender rush occurs in damp grassy places in the central and north coasts and in the central and northern Sierra Nevada. In the East Bay, it has been recorded at five general locations, including the East Bay Hills, Potrero Hills, Morgan Territory, the Altamont Hills, and western Alameda County. It is on the CNPS East Bay Chapter's rank "A-2" list (Lake, 1995). Within the study area, slender rush is relatively common in moist grasslands throughout the study area, occurring with purple needlegrass (Figure 2).

BLUE TOADFLAX

Blue toadflax (*Linaria canadensis*) is a slender, annual member of the figwort family (Scrophulariaceae). Its stem is from 5 to 20 inches tall, bearing a dense, racemose inflorescence of showy pale blue flowers. It is reported from fewer than 10 locations in Alameda and Contra Costa Counties, and is on the CNPS East Bay Chapter's rank

"B" list (Lake, 1995). Within the study area, blue toadflax occurs at several locations on rocky soil associated with coastal scrub (Figure 2).

VANCOUVER'S RYEGRASS

Vancouver's ryegrass *(Leymus x vancouverensis)* is a tufted perennial member of the grass family (Poaceae). Its culms reach 2 to 4 feet tall, and are sparsely to densely hairy below the inflorescence. It is thought to be a stable hybrid between *Leymus mollis* and *L. triticoides*. It has not been previously reported from the East Bay (Ertter, 1997), and so can be considered a regional rarity in the study area. Onsite, Vancouver's ryegrass occurs sparingly in coastal scrub near the shoreline.

YELLOW BUSH LUPINE

Yellow bush lupine (*Lupinus arboreus*) is a medium-sized perennial shrub in the pea family (Fabaceae). It is a very attractive component of the northern coastal scrub and dune communities, occurring naturally near the coast from Ventura to Sonoma counties and has become naturalized further north. It produces abundant, large spikes of bright yellow flowers from March through June. On the San Francisco Peninsula, yellow bush lupine is listed as being common and widespread (Howell *et al.,* 1958; Thomas, 1961). The species is common in Marin County, including Angel Island and in San Mateo County. In the East Bay, yellow bush lupine is restricted to the islands off Point Richmond, the East Bay Hills, and possibly Alameda and Berkeley. It is on the CNPS East Bay Chapter's rank "A-1" list (Lake, 1995). Within the study area, yellow bush lupine was detected in northern coastal bluff scrub habitat above Building 69 and on the slope south of Tank 3 (Figure 2).

PLUMP-SEEDED MADIA

Plump-seeded madia (*Madia anomala*) is a low, branching annual in the sunflower family (Asteraceae). This species was not identified during the present surveys. However, it was found at a single population by Lake (1996) above Tank 11 (Figure 2). This species produces slender stems that are glandular in the upper half, growing up to 1.5 feet tall. Leaves are villous, glandular above, and up to 2.5 inches long. Inflorescences are paniculate and not congested. Flower heads have 3 to 7 yellow ray flowers and 3 to 6 yellow disk flowers. Flowers appear from May through June. In the East Bay, plump-seeded madia has been recorded from near Mt. Diablo, the Mt. Hamilton Range, and Altamont Hills. It has not been previously recorded from the Potrero Hills. It is on the CNPS East Bay Chapter's rank "A-1" list (Lake, 1995).

REIN-ORCHID

Rein-orchid (*Piperia transversa)* is a tuberous, perennial member of the orchid family (Orchidaceae). The plants range in height from 7 inches to about 2 feet. Its often dense, narrowly cylindrical, spike-like inflorescence bears small, whitish flowers with spurs which are arranged perpendicular to the stem. The leaves, all basal, are generally withered away at the time of flowering. Rein-orchid has been recorded in the East Bay from only two locations, including Cedar Mountain and Flicker Ridge. It is on the CNPS East Bay Chapter's rank "A-1" list (Lake, 1995). Within the study area, rein-orchid was detected in eucalyptus woodland between Tanks 7 and 13 (Figure 2).

STIPITATE POPCORN-FLOWER

Stipitate popcorn-flower *(Plagiobothrys stipitatus var. micranthus)* is a small, low-growing, annual member of the borage family (Boraginaceae). Its ascending to erect stems generally branch from the base, ranging in height from 4 to 20 inches, and bear racemes of tiny white flowers. It prefers to grow in vernal pools or vernally wet places in grasslands. It is recorded from approximately 12 locations in the East Bay, mostly in the interior, eastern parts of Alameda and Contra Costa counties. It is on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, stipitate popcorn-flower occurs on a vernally wet depression at Tank 9 (Figure 2).

GOLDEN DOCK

Golden dock (*Rumex maritimus)* is an annual or biennial, herbaceous member of the buckwheat family (Polygonaceae). Its leafy, erect stem reaches heights of from 10 to 30 inches, and bears generally dense, interrupted whorls or pannicles of inconspicuous flowers. It prefers wet, generally salty habitats. In the East Bay, golden dock has been reported from brackish or salt marshes at Hercules and Alvarado, and from Lake Chabot. It is on the CNPS East Bay Chapter's rank "A-2" list (Lake, 1995). Within the study area, golden dock is found in a single location in the small salt marsh west of Pond Road (Figure 2).

WILLOW DOCK

Willow dock (*Rumex salicifolius* ssp. *crassus*) is a prostrate to decumbent perennial in the buckwheat family (Polygonaceae). It forms low clumps of fleshy stems up to 2 feet long, with fleshy, linear to ovate leaves up to 8 inches long. Flowers are

inconspicuous, appearing May through September. In the East Bay, willow dock is only known from the vicinity of Point Richmond. It is on the CNPS East Bay Chapter's rank "A-1" list (Lake, 1995) due to its occurrence in limited and threatened habitats. Within the study area, willow dock occurs on the point at the end of Warehouse Road and in the grassland north of D Road (Figure 2).

LARGE-FLOWERED SAND-SPURREY

Large-flowered sand-spurrey (*Spergularia macrotheca* var. *macrotheca*) is a low, mat-forming perennial in the pink family (Caryophyllaceae). It produces linear, glandular-pubescent, fleshy leaves up to 1.5" long. Flowers are mostly pink, attractive, and diminutive, and can appear year-round. The variety occurs near salt marshes and on sea bluffs from British Columbia to Baja California. In the East Bay, the variety is known from seven locations near Point Molate, in western Alameda County, and near the San Joaquin/Sacramento River Delta. It is on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, large-flowered sand-spurrey occurs infrequently on exposed sandstone bluff faces just above the high tide line on the point at the north end of Warehouse Road on the bluffs above Building 69 (Figure 2).

WHITE BRODIAEA

White brodiaea (*Triteleia hyacinthina*) is a perennial, bulbiferous member of the lily family (Liliaceae). Its loose, umbel-like inflorescence of white flowers is borne on a scape up to 30 inches or more in height, above long, narrow basal leaves. Found throughout northern and central California, it grows in vernally wet meadows and grassland. Known from only five locations in the East Bay, it is on the CNPS East Bay Chapter's rank "B" list (Lake, 1995). Within the study area, a single population was recorded from grassland west of Tank 15. (Figure 2).

4.0 CONCLUSIONS

A single, special-status plant species, marsh gum-plant, was detected at NFD Point Molate during the present surveys. This relatively common saltmarsh species occurs in large numbers on site. Marsh gum-plant occurs in wetland areas that are subject to the permit requirements of Section 404 of the Clean Water Act.

Although not afforded any formal status as special-status species, numerous plant taxa of botanical interest do occur on site. Species whose distribution in the East Bay is restricted entirely to the Potrero Hills include dichondra, and seaside woolly-sunflower. Species known from the East Bay but never before recorded from the Point Richmond area include foothill sedge, rein orchid, chaffweed, golden dock, fragile fern, and remote-leaved thistle. Species never before recorded from the East Bay include wild hyacinth, Jepson's blue wildrye, and Vancouver's ryegrass. Species known from five or fewer locations in the East Bay include slender rush, deer-bed sedge, bluff lettuce, fragrant everlasting, yellow bush lupine, plump-seeded madia, willow dock, white brodiaea, and congested toad rush. Species known from fewer than 15 locations in the East Bay include Dutchman's pipevine, centaury, coast buckwheat, red fescue, large-flowered sand-spurrey, brownie thistle, stipitate popcorn-flower, Davy's centaury, and blue toadflax. These taxa represent botanically unusual resources in the East Bay.

Coastal terrace prairie and northern coastal bluff scrub habitats are exceedingly rare in the East Bay and represent diminishing habitats throughout their range.

Many of the native plant species and communities at NFD Point Molate are very unusual in Contra Costa County. These plant communities have a stronger affinity to those on the west side of San Francisco Bay than the East Bay and represent island-like remnants of habitats that are restricted by the coastal climate. The diversity of native plant species is unusual considering the site's history of human disturbance. This is especially true for the native perennial grasses, which exhibit very high levels of density and diversity. Native grasslands of comparable quality are extremely uncommon in the East Bay, as well as in more coastal areas in Marin County. The diversity of wildflowers in the grasslands is also unusual in the region. Although more highly disturbed and occurring to a much lesser extent, the coastal bluff and scrub communities have similar values.

5.0 LITERATURE CITED

California Department of Fish and Game (CDFG). 1984. Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities. The Resources Agency, Sacramento.

California Department of Fish and Game (CDFG). 1990. Natural Communities. Natural Diversity Data Base, Natural Heritage Division. November.

California Department of Fish and Game (CDFG). 1997. Natural Diversity Data Base Print-out for the Richmond, San Quentin Mare Island USGS quads. April.

California Department of Fish and Game (CDFG). 1998a. *Special Plants List.* Natural Heritage Division, Natural Diversity Data Base. April.

California Department of Fish and Game (CDFG). 1998b. *State and Federally Listed Endangered, Threatened, and Rare Plants of California.* Natural Heritage Division, Endangered Plant Program. Revised April 7.

Clarke, William C. 1952. The vegetation cover of the San Francisco Bay region in the early Spanish period. Unpublished dissertation. 220 pp.

County of Contra Costa. 1991. Contra Costa County General Plan: 1900-2005. Community Development Department, Martinez, California. January.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131 pp.

Ertter, B. 1997. Annotated Checklist of the East Bay Flora. California Native Plant Society, East Bay Chapter, in association with the University the Jepson Herbaria, U.C. Berkeley. Special Publ. #3. April. 114 pp.

Havlik, N. 1982. Natural Resources Management Plan, Point Molate Site. Unpubl. Tech. Rep. prepared for the U.S. Navy, Naval Supply Center, Oakland, Fuel Department. April. 45 pp.

Hickman, J.C. 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, California. 1400 pp.

Holland, R. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. California Department of Fish and Game, The Resources Agency. 156 pp.

Holland, V.L., and D.J. Keil. 1990. California Vegetation. Calif. Polytechnic State University, San Luis Obispo. 4th edition. 318 pp.

Howell, J.T. 1970. Marin flora. University of California Press, Berkeley, California. 366 pp.

Howell, J.T., P.H. Raven, and P. Rubtzoff. 1958. A Flora of San Francisco, California. Univ. of San Francisco. 157 pp.

Lake, D. 1995. Unusual and Significant Plants of Alameda and Contra Costa Counties. Fourth Edition. California Native Plant Society, East Bay Chapter. March 1.

Lake, D. 1996. Botanical Evaluation of Pt. Molate. Rare Plant Committee, East Bay Chapter, California Native Plant Society. June 5.

LSA Associates, Inc. 1987. Natural Resources Management Plan, Point Molate Fuel Supply Depot. Unpubl. Tech. Rep., prepared for Natural Resources Mgt. Branch, Western Division, Naval Facilities Engineering Command, San Bruno. October.

McClintock, E., P. Reeberg, and W. Knight. 1990. A Flora of the San Bruno Mountains. California Native Plant Society, Sacramento. Special Publ. No. 8. 223 pp.

Olson, B.L. 1994. Status of Rare, Threatened and Endangered Vascular Plants in Alameda and Contra Costa Counties (and some adjacent areas). Third Edition. California Native Plant Society, East Bay Chapter, Rare Plant Committee. March 1.

Ripley, J.D. 1980. Plants of Angel Island, Marin County, California. Great Basin Naturalist 40(4):385-407.

Sawyer, J.O. and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento. 471 pp.

Shuford, W.D. and I.C. Timossi. 1989. Plant Communities of Marin County. California Native Plant Society, Sacramento. 32 pp.

Skinner, M.W. and B.M. Pavlik. 1997. Electronic Inventory of Rare and Endangered Vascular Plants of California. Fifth ed. update. California Native Plant Society, Sacramento, California. August 11.

Tetra Tech, Inc. 1996. Final Jurisdictional Wetland Delineation of Fleet Industrial Supply Center, Naval Fuel Depot, Point Molate. Unpubl. Tech. Rep., prepared for Uribe and Associates, Oakland, and U.S. Navy, Engineering Field Activity West, San Bruno. October.

Thomas, J.H. 1961. Flora of the Santa Cruz Mountains of California. Stanford University Press. 434 pp.

United States Department of Agriculture (USDA). 1977. Soil Survey of Contra Costa County, California. Natural Resource Conservation Service. September

U.S. Department of the Interior. (no date). Winehaven, Point Molate Naval Fuel Depot: Photographs and Written Historical and Descriptive Data. Historic American Buildings Survey, National Park Service, Western Region, San Francisco.

U.S. Department of the Navy (DON). 1986. Natural Resources Management Plan, Treasure Island Naval Station. Natural Resources Management Staff, Western Division Naval Facilities Engineering Command. May.

U.S. Fish and Wildlife Service (USFWS). 1995. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11 & 17.12. October 31.

U.S. Fish and Wildlife Service (USFWS). 1996a. Endangered and Threatened Plant and Animal Taxa; Proposed Rule. 50 CFR part 17. February 28.

U.S. Fish and Wildlife Service (USFWS). 1996b. Federally Listed and Proposed Endangered and Threatened Plants of California. Updated July 1.

Wood, M. 1994. Rare Plant Survey of Mare Island Naval Shipyard, Solano County, California. Unpubl. Tech. Rep. prepared for Tetra Tech, Inc., San Francisco. September.

Wood, M. 1996a. Rare and Endangered Plants of San Francisco's Wild and Scenic Places. Rare Plant Committee, Yerba Buena Chapter, California Native Plant Society. February.

Wood, 1996b. Special-status Plant Survey and Habitat Assessment of Yerba Buena Island, San Francisco County, California. Unpubl. Tech. Rep. prepared for Tetra Tech, Inc., San Francisco. July.

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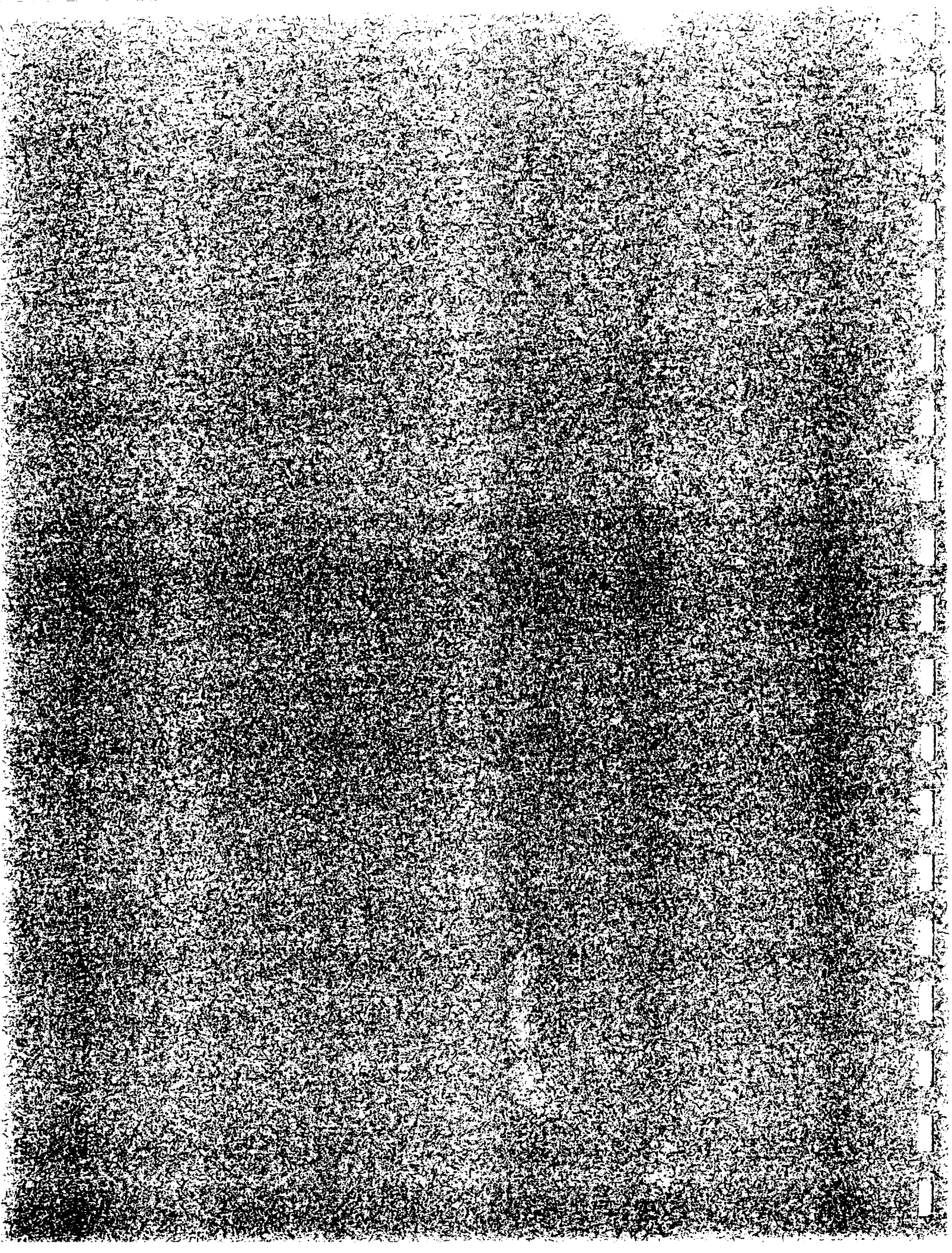
7.0 ACRONYMS AND ABBREVIATIONS

BRAC	Base Realignment and Closure Cleanup Plan
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
EIR	environmental impact report
EIS	environmental impact statement
ESA	Endangered Species Act
NEPA	National Environmental Policy Act
NFD	Navy Fuel Depot
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

APPENDIX A
PLANT SPECIES DETECTED AT NAVAL FUEL DEPOT, POINT MOLATE



APPENDIX A

Plant Species Detected at Naval Fuel Depot, Point Molate

CLASS Family *Scientific Name*	Common Name
FILICINAE	
Dennstaedtiaceae - Bracken Family	
Pteridium aquilinum var. *pubescens*	western brackenfern
Dryopteridaceae - Fern Family	
Cystopteris fragilis[2]	fragile fern
Dryopteris arguta	wood fern
Polystichum munitum	western sword fern
Polypodiaceae - Fern Family	
Polypodium calirhiza	polypody
Pteridaceae - Fern Family	
Adiantum jordanii	maidenhair fern
Pellaea andromedaefolia	coffee fern
Pentagramma triangularis ssp. *triangularis*	goldback fern
CONIFERAE	
Cupressaceae - Cypress Family	
*Chamaecyparis lawsonii**	Port Orford cedar
Cupressus arizonica ssp. *arizonica**	Arizona cypress
*Cupressus macrocarpa**	Monterey cypress
Juniperus sp.*	juniper
Pinaceae - Pine Family	
*Pinus canariensis**	Canary Island pine
*Pinus halepensis**	aleppo pine
*Pinus pinea**	Italian stone pine
*Pinus radiata**	Monterey pine
*Pseudotsuga menziesii**	Douglas-fir
DICOTYLEDONAE	
Acanthaceae - Acanthus Family	
*Acanthus mollis**	bears breech
Aceraceae - Maple Family	
Acer sp.*	maple
Aizoaceae - Carpetweed Family	
*Carpobrotus edulis**	Hottentot fig

CLASS Family *Scientific Name*	**Common Name**
*Tetragonia tetragonioides**	New Zealand spinach
Amaranthaceae - Amaranth Family	
Amaranthus sp.*	pigweed
Anacardiaceae - Sumac Family	
Toxicodendron diversilobum	poison oak
Apiaceae - Parsley Family	
*Anthriscus caucalis**	bur-chervil
Daucus pusillus	rattlesnake weed
*Foeniculum vulgare**	sweet fennel
Heracleum lanatum	cow parsnip
Osmorhiza chilensis	sweet-cicely
Perideridia kelloggii	Kellogg's yampah
Sanicula bipinnatifida	purple sanicle
Sanicula crassicaulis	Pacific sanicle
*Torilis arvensis**	hedge-parsley
Apocynaceae - Dogbane Family	
*Nerium oleander**	common oleander
*Vinca major**	periwinkle
Araliaceae - Aralia Family	
*Hedera helix**	English ivy
Aristolochiaceae - Birthwort Family	
Aristolochia californica[2]	Dutchman's pipevine
Asteraceae - Sunflower Family	
Achillea millefolium	yarrow
Agoseris grandiflora	California dandelion
*Anthemis cotula**	dog mayweed
Artemisia californica	California sagebrush
Artemisia douglasiana	mugwort
Aster chilensis	common California aster
Aster radulinus	rough-leaved aster
Baccharis douglasii	marsh baccharis
Baccharis pilularis	coyote brush
*Carduus pycnocephalus**	Italian thistle
*Carduus tenuiflorus**	slender-flowered thistle
*Centaurea calcitrapa**	purple star-thistle
*Centaurea solstitialis**	yellow star-thistle
Cirsium quercetorum[2]	brownie thistle
Cirsium remotifolium[2] ?	remote-leaved thistle
*Cirsium vulgare**	bull thistle
*Conyza bilboana**	horseweed

CLASS
Family

Scientific Name	Common Name
*Conyza canadensis**	horseweed
*Cotula australis**	Australian brass-buttons
*Cotula coronopifolia**	African brass-buttons
*Cynara cardunculus**	artichoke thistle
*Erechtites glomerata**	cut-leaved coast fireweed
Eriophyllum confertiflorum var. *confertiflorum*	golden-yarrow
Eriophyllum staechadifolium[2]	seaside woolly-sunflower
*Filago gallica**	narrow-leaf filago
Gnaphalium bicolor	bicolor cudweed
Gnaphalium californicum	California everlasting
Gnaphalium canescens ssp. *beneolens*[2]	fragrant everlasting
*Gnaphalium luteo-album**	cudweed
Gnapahlium purpureum	purple cudweed
Gnaphalium ramosissimum	pink everlasting
Grindelia hirsutula var. *hirsutula*	hirsute grindelia
Grindelia stricta var. *angustifolia*[1,2]	marsh gum-plant
*Hedypnois cretica**	Crete hedypnois
Helenium puberulum	sneezeweed
Hemizonia fitchii	Fitch's spikeweed
Hemizonia pungens ssp. *pungens*	common spikeweed
Heterotheca grandiflora	telegraph weed
*Hypochaeris glabra**	smooth cat's-ear
*Hypochoeris radicata**	rough cat's-ear
Iva axillaris ssp. *robustior*	poverty weed
Jaumea carnosa	jaumea
*Lactuca serriola**	prickly lettuce
Madia anomala[2]?+	plump-seeded madia
Madia gracilis	slender tarweed
Madia sativa	coast tarweed
Micropus californicus var. *californicus*	slender cottonweed
*Picris echioides**	bristly ox-tongue
Psilocarphus tenellus var. *tenellus*	woolly-heads
*Senecio vulgaris**	common groundsel
*Silybum marianum**	milk-thistle
Solidago californica	California goldenrod
*Soliva sessilis**	common soliva
*Sonchus asper**	prickly sow-thistle
*Sonchus oleraceus**	common sow-thistle
Stephanomeria virgata ssp. *pleurocarpa*	tall stephanomeria
*Tragopogon porrifolius**	salsify
Uropappus lindleyi	silver puffs
Wyethia angustifolia	narrowleaf mule-ears
*Xanthium strumarium**	eastern cocklebur

CLASS Family *Scientific Name*	Common Name
Boraginaceae - Borage Family	
Plagiobothrys stipitatus var. *micranthus*	stipitate popcorn-flower
Brassicaceae - Mustard Family	
*Brassica nigra**	black mustard
*Brassica rapa**	field mustard
*Cakile maritima**	sea-rocket
Cardamine oligosperma	bitter cress
*Hirschfeldia incana**	hoary mustard
*Lepidium latifolium**	broad-leaf peppergrass
Lepidium nitidum var. *nitidum*	peppergrass
*Raphanus sativus**	wild radish
*Rorippa nasturtium-aquaticum**	water cress
*Sisymbrium officinale**	hedge mustard
Callitrichaceae - Water-starwort Family	
Callitriche marginata	California water-starwort
Caprifoliaceae - Honeysuckle Family	
Lonicera hispidula var. *vacillans*	California honeysuckle
*Lonicera japonica**?+	Japanese honeysuckle
Sambucus mexicana	blue elderberry
Symphoricarpos albus var. *laevigatus*	snowberry
Caryophyllaceae - Pink Family	
*Cerastium glomeratum**	mouse-ear chickweed
*Polycarpon tetraphyllum**	four-leaved allseed
*Silene gallica**	common catchfly
Spergularia macrotheca var. *macrotheca*[2]	large flowered sand-spurry
*Spergularia rubra**	ruby sand-spurry
*Spergularia villosa**	villous sand-spurry
*Stellaria media**	common chickweed
Casuarinaceae - She-oak Family	
*Casuarina equisetifolia**	horsetail casuarina
Celastraceae - Staff-tree Family	
*Euonymus japonica**	euonymus
Ceratophyllaceae - Hornwort Family	
Ceratophyllum demersum	hornwort
Chenopodiaceae - Goosefoot Family	
*Atriplex triangularis**	spearscale
Salicornia virginica	pickleweed
*Salsola soda**	Russian thistle

CLASS Family *Scientific Name*	**Common Name**
Convolvulaceae - Morning-glory Family	
Calystegia purpurata ssp. *purpurata*	morning-glory
Calystegia subacaulis	hill morning-glory
*Convolvulus arvensis**	field bindweed
Dichondra donelliana[2]	dichondra
Crassulaceae - Stone-crop Family	
*Crassula argentea**	jade plant
Crassula connata	pigmy-weed
Dudleya farinosa[2]	bluff lettuce
Cucurbitaceae - Gourd Family	
Marah fabaceus	California man-root
Cuscutaceae - Dodder Family	
Cuscuta salina var. *major*	salty sodder
Dipsacaceae - Teasel Family	
*Dipsacus sativus**	Fuller's teasel
Euphorbiaceae - Spurge Family	
*Chamaesyce maculata**	spotted spurge
Chamaesyce serpyllifolia ssp. *serpyllifolia*	thyme-leaved spurge
Eremocarpus setigerus	doveweed
Euphorbia crenulata+	spurge
*Euphorbia peplus**	petty spurge
Fabaceae - Pea Family	
*Acacia dealbata**	silver wattle
*Acacia melanoxylon**	blackwood acacia
Astragalus gambelianus	Gambel's dwarf locoweed
*Chamaesyce maculata**	spotted spurge
*Cytisus scoparius**	Scotch broom
*Erythrina crista-galli**	coral tree
*Genista monspessulana**	French broom
*Lathyrus latifolius**	perennial sweet pea
Lathyrus vestitus var. *vestitus*	common Pacific pea
*Lotus corniculatus**	bird foot trefoil
Lotus humistratus	hill lotus
Lotus micranthus	least trefoil
Lotus purshianus var. *purshianus*	Spanish clover
Lotus scoparius	California broom
Lotus wrangelianus	Chile trefoil
Lupinus arboreus[2]	yellow bush lupine
Lupinus bicolor	dove lupine
Lupinus bicolor var. *umbellatus*	dove lupine
Lupinus formossus var. *formosus*	summer lupine

CLASS Family *Scientific Name*	Common Name
Lupinus succulentus+	succulent annual lupine
*Medicago polymorpha**	bur-clover
*Melilotus albus**	white sweet-clover
*Melilotus indica**	yellow sweet-clover
*Robinia pseudo-acacia**	black locust
Trifolium ciliolatum+	tree clover
*Trifolium dubium**	little hop clover
Trifolium gracilentum var. *gracilentum*+	pin-point clover
*Trifolium hirtum**	rose clover
Trifolium microcephalum+	small head clover
*Trifolium subterraneum**	subterranean clover
Vicia americana var. *americana*	American vetch
*Vicia benghalensis**	vetch
Vicia sativa ssp. *nigra**	common vetch
Vicia sativa ssp. *sativa**	common vetch
Vicia villosa ssp. *villosa**	hairy vetch
Fagaceae - Oak Family	
Quercus agrifolia	coast live oak
Gentianaceae - Gentian Family	
Centaurium davyi[2]	Davy's centaury
Centaurium muehlenbergii[2]	centaury
Geraniaceae - Geranium Family	
*Erodium botrys**	long-beaked filaree
*Erodium cicutarium**	red-stemmed filaree
*Erodium moschatum**	white-stemmed filaree
*Geranium dissectum**	cut-leaved geranium
*Geranium molle**	crane's-bill geranium
*Pelargonium peltatum**	ivy geranium
Grossulariaceae - Gooseberry Family	
Ribes californicum var. *californicum*	hillside gooseberry
Ribes menziesii	canyon gooseberry
Hippocastanaceae - Buckeye Family	
Aesculus californica	California buckeye
Hydrophyllaceae - Waterleaf Family	
Phacelia californica	phacelia
Phacelia imbricata ssp. *imbricata*	phacelia
Juglandaceae - Walnut Family	
*Juglans regia**	English walnut
Lamiaceae - Mint Family	
Monardella villosa ssp. *villosa*	coyote mint
Pogogyne serpylloides	thyme-leaved pogogyne

CLASS Family *Scientific Name*	Common Name
Stachys ajugoides var. *rigida*	rigid hedge nettle
Lauraceae - Laurel Family	
*Persea americana**	avocado
Umbellularia californica	California bay
Lythraceae - Loosesstrife Family	
*Lythrum hyssopifolia**	loosestrife
Malvaceae - Mallow Family	
*Malva parviflora**	cheeseweed
Sidalcea malvaeflora ssp. *malvaeflora*	checker mallow
Melastomataceae - Melastoma Family	
Melastoma sp.*	princess flower
Myoporaceae - Myorporum Family	
*Myoporum laetum**	myoporum
Myrtaceae - Myrtle Family	
*Eucalyptus globulus**	Tasmanian blue gum
*Syzygium uniflora**	Surinam-cherry
Oleaceae - Olive Family	
*Olea europea**	olive
Onagraceae - Evening Primrose Family	
Camissonia ovata	sun cups
Epilobium brachycarpum	fireweed
Epilobium ciliatum ssp. *ciliatum*	northern willow herb
Oxalidaceae – Oxalis Family	
*Oxalis pes-caprae**	Bermuda buttercup
Papaveraceae - Poppy Family	
Eschscholzia californica	California poppy
Pittosporaceae - Pittosporum Family	
*Pittosporum crassifolium**	thick-leaved pittosporum
*Pittosporum undulatum**	victorian box
Plantaginaceae - Plantain Family	
*Plantago coronopus**	cut-leaved plantain
Plantago erecta	plantain
*Plantago lanceolata**	English plantain
*Plantago major**	broadleaf plantain
Platanaceae - Sycamore Family	
*Platanus acerifolia**	London plane tree
Plumbaginaceae - Thrift Family	
Limonium californicum	sea-lavander

CLASS Family *Scientific Name*	Common Name
*Limonium sinuatum**	statice
Polemoniaceae - Phlox Family	
Gilia sp.+	gilia
Navarretia squarrosa	skunkweed
Polygonaceae - Buckwheat Family	
Eriogonum nudum var. auriculatum[2]	coast buckwheat
*Polygonum arenastrum**	common knotweed
*Rumex acetosella**	sheep sorrel
*Rumex conglomeratus**	whorled dock
*Rumex crispus**	curly dock
Rumex maritimus	golden dock
*Rumex obtusifolius**+	bitter dock
*Rumex pulcher**	fiddle dock
Rumex salicifolius ssp. *crassus*[2]+	willow dock
Portulaceae - Purslane Family	
Claytonia parviflora ssp. *parviflora*+	miner's lettuce
Claytonia perfoliata ssp. *perfoliata*	miner's lettuce
Primulaceae - Primrose Family	
*Anagallis arvensis**	scarlet pimpernel
Centunculus minimus[2]	chaffweed
Rhamnaceae - Buckthorn Family	
Rhamnus californica ssp. *californica*	California coffeeberry
Rosaceae - Rose Family	
Acaena pinnatifida var. *californica*	California acaena
Aphanes occidentalis	western lady's mantle
*Cotoneaster pannosa**	cotoneaster
Heteromeles arbutifolia	toyon
Oemleria cerasiformis	oso berry
Potentilla glandulosa ssp. *glandulosa*	cinquefoil
*Pyracantha angustifolia**	common firethorn
*Pyrus communis**	pear
Rosa californica	California rose
*Rosa odorata**	tea rose
*Rubus discolor**	Himalayan blackberry
Rubus ulmifolius var. *inermis**	evergreen thornless blackberry
Rubus ursinus	California blackberry
Rubiaceae - Madder Family	
Galium aparine	bedstraw
Galium porrigens var. *porrigens*	climbing bedstraw
Salicaceae - Willow Family	
Salix laevigata	red willow

CLASS Family *Scientific Name*	**Common Name**
Salix lasiolepis	arroyo willow
Saxifragaceae - Saxifrage Family	
*Escallonia rubra**	escallonia
Scrophulariaceae - Figwort Family	
*Antirrhinum majus**	snap dragon
*Bellardia trixago**	bellardia
Castilleja densiflora ssp. *densiflora*	owl's-clover
Castilleja foliolosa	woolly Indian paintbrush
Linaria canadensis	blue toad flax
Mimulus aurantiacus	bush monkey-flower
Mimulus guttatus	common large monkey-flower
Scrophularia californica ssp. *californica*	California figwort, bee plant
*Verbascum thapsus**	woolly mullein
Veronica sp.	
Solanaceae - Nightshade Family	
*Nicotiana glauca**	tree tobacco
Solanum americanum	white nightshade
*Solanum furcatum**	forked nightshade
Tropaeolaceae - Nasturtium Family	
*Tropaeolum majus**	garden nasturtium
Ulmaceae - Elm Family	
*Ulmus pumila**	Siberian elm
Urticaceae - Nettle Family	
*Soleirolia soleirolii**	baby's tears
Valerianaceae - Valerian Family	
*Centranthus ruber**	red valerian
Verbenaceae - Vervain Family	
Phyla nodiflora var. *nodiflora*	lippia
MONOCOTYLEDONAE	
Araceae - Arum Family	
*Zantedeschia aethiopica**	calla lily
Arecaceae - Palm Family	
*Phoenix canariensis**	Canary Island palm
Cyperaceae - Sedge Family	
Carex barbarae	Barbara's sedge
Carex praegracilis[2]	deer-bed sedge
Carex tumulicola[2]	foothill sedge
Cyperus eragrostis	umbrella sedge
Eleocharis macrostachya	creeping spike-rush

CLASS Family *Scientific Name*	Common Name
Scirpus californicus	California bulrush
Scripus cernuus	low bulrush
Scirpus maritimus	saltmarsh bulrush
Iridaceae - Iris Family	
*Chasmanthe floribunda**	chasmanthe
Iris x hybrid*	bearded iris
Sisyrinchium bellum	California blue-eyed grass
Juncaceae - Rush Family	
Juncus balticas	wire rush
Juncus bufonius var. *bufonius*	toad rush
Juncus bufonius var. *congestus*[2]	congested toad rush
Juncus effusus var. *pacificus*	common rush
Juncus occidentalis[2]	slender rush
Juncus patens	spreading rush
Juncus phaeocephalus var. *paniculatus*	brown-headed rush
Juncus tenuis	rush
Juncus xiphioides	iris-leaf rush
Luzula comosa	wood rush
Liliaceae - Lily Family	
*Agapanthus africanus**	lily-of-the-Nile
*Agave americana**	century plant
*Allium cepa**	yellow onion
Brodiaea elegans ssp. *elegans*	harvest brodiaea
Chlorogalum pomeridianum var. *pomeridianum*	wavy-leaf soap plant
Dichelostemma capitatum ssp. *capitatum*	blue dicks
Dichelostemma multiflorum[3]	wild hyacinth
Triteleia hyacinthina[2]	white brodieae
Triteleia laxa	Ithuriel's spear
Orchidaceae - Orchid Family	
Piperia elegans	elegant rein-orchid
Piperia transversa[2]	rein-orchid
Poaceae - Grass Family	
Agrostis pallens	leafy bentgrass
*Agrostis viridis**	water bent grass
*Aira caryophyllea**	silver European hairgrass
*Arundo donax**	giant reed
*Avena barbata**	slender wild oat
*Avena fatua**	wild oat
*Brachypodium distachyon**	purple falsebrome
*Briza maxima**	big quaking grass
*Briza minor**	little quaking grass

CLASS
Family

Scientific Name	**Common Name**
Bromus carinatus var. *carinatus*	California brome
*Bromus diandrus**	ripgut brome
*Bromus hordeaceus**	soft chess
Bromus madritensis ssp. *madritensis**	red brome
Bromus madritensis ssp. *rubens**	red brome
*Cortaderia jubata**	pampas grass
*Cynodon dactylon**	Bermuda grass
*Dactylis glomerata**	orchard grass
Danthonia californica var. *californica*	California oatgrass
Deschampsia elongata	slender hairgrass
Distichlis spicata	saltgrass
Elymus glaucus ssp. *glaucus*	blue wildrye
Elymus glaucus ssp. *jepsonii*[3]	blue wildrye
Elymus elymoides	squirreltail
Elymus multisetus	big squirreltail
*Festuca arundinacea**	tall fescue
Festuca californica	California fescue
Festuca idahoensis	Idaho fescue
Festuca rubra[2]	red fescue
*Gastridium ventricosum**	nit grass
*Holcus lanatus**	velvet grass
Hordeum brachyantherum ssp. *brachyantherum*	meadow barley
Hordeum marinum ssp. *gussoneanum**	Mediterranean barley
Hordeum murinum ssp. *leporinum**	hare barley
Koeleria macrantha	junegrass
Leymus triticoides	creeping ryegrass
Leymus x vancouverensis[3]	Vancouver's ryegrass
*Lolium multiflorum**	Italian ryegrass
*Lolium perenne**	perennial ryegrass
Melica californica	California melic grass
Melica torreyana	Torrey melic
Nassella lepida	foothill needlegrass
Nassella pulchra	purple needlegrass
*Parapholis incurva**	sickle grass
*Paspalum dilatatum**	Dallis grass
*Phalaris aquatica**	Harding grass
*Phalaris paradoxa**	paradox canary grass
*Piptatherum miliaceum**	smilo grass
*Poa annua**	annual bluegrass
Poa secunda ssp. *secunda*	one-sided bluegrass
*Polypogon interruptus**	ditch beard grass
*Polypogon monspeliensis**	rabbitfoot grass
Spartina foliosa	California cordgrass

CLASS Family *Scientific Name*	Common Name
*Vulpia bromoides**	six-weeks fescue
Vulpia microstachys	few-flowered fescue
Vulpia myuros var. *myuros**	zorro grass
Typhaceae - Cattail Family	
Typha angustifolia	narrow-leaved cattail
Typha latifolia	broadleaf cattail

* denotes nonnative species or species not naturally occurring onsite
+ species identified onsite by Lake (1996), but not relocated during the present surveys
? indicates uncertain identification due to condition of plant material
[1] indicates sensitive taxon
[2] indicates unusual or significant taxon in Contra Costa County (Lake, 1995)
[3]indicates taxon not previously recorded from the East Bay (Ertter pers. comm.)