Rare Plant Survey Report

for the

Martinez Bay Trail Project Phase II

Contra Costa County, California

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1. Introduction

This report summarizes the results of floristic, protocol-level rare plant surveys conducted by Swaim Biological, Inc. (SBI) at the Martinez Bay Trail Phase II Project (Project) in the City of Martinez, California. Surveys were conducted on March 26, June 2, and August 11, 2021, which correspond to the peak blooming periods of the rare plant species that were determined to have the potential to occur in the survey area.

Construction of the Project has been proposed as an expansion and improvement to the larger San Francisco Bay Trail (SFBT) and is being developed by the Association of Bay Area Governments in conjunction with local agencies. The Project is to begin at the East Bay Regional Park District (EBRPD) Nejedly Staging Area and provide a link to the SFBT at the EBRPD Radke Martinez Regional Shoreline parking lot, approximately 0.5-mile northeast of Nejedly Staging Area. The proposed Project includes improvements to construct approximately 3,100 feet of trail and the paving of an approximately 700-foot portion of existing trail from the Nejedly Staging Area to the UPRR right-of-way that is currently constructed with aggregate base.

2. Site Description and Location

The proposed Project is located within the City of Martinez in Contra Costa County, California. (**Figure 1**). It is within the Benicia 7.5-minute USGS topographic quadrangle.

Segment 1 of the trail/survey area (**Figure 2.1**) begins at the Nejedly Staging Area at Carquinez Scenic Drive and extends northwest for approximately 800 feet to approximately 100 feet south of the UPRR right-of-way. Proposed work in this segment includes removal of upland and ruderal vegetation on the existing gravel trail and resurfacing the trail with asphalt. Vegetation removal to clear the existing rock-lined ditches adjacent to the trail and minor bridge maintenance to repair a gap between the existing trail and bridge abutment will also be required. Segment 2 of the trail/survey area (**Figure 2.2**) is approximately 1,900 feet in length and extends roughly parallel to the UPRR right-of-way. Proposed work in this segment will include trail construction, grading, vegetation removal, and fill of less than 0.5-acre of jurisdictional wetlands (Swaim 2020a). The proposed paved trail will be approximately 10 feet wide with 2-foot-wide aggregate base shoulders.

2.1 Environmental Setting

The Project is located in the East Bay of the San Francisco Bay Area, adjacent to the south shoreline of the Carquinez Straight/Suisun Bay, west of California Highway I-680 and the Benicia-Martinez Bridge. Segment 1 of the survey area largely occurs within the oak (dominated by coast live oak – *Quercus agrifolia*) and eucalyptus (*Eucalyptus spp.*) woodlands within the Carquinez Strait Regional Shoreline. The north end of Segment 1 is bordered on the north by the UPRR tracks, and on the northwest by coastal scrub habitat. Segment 2 of the survey area is bordered on the north by the UPRR tracks and on the west by coastal scrub habitat. Industrial, commercial, and residential development occur immediately north of the UPRR right-of-way, interspersed with coastal tidal marsh and brackish marsh habitat. Segment 2 of the survey area is bordered on the south by the Carquinez Regional Shoreline along its western half, and by industrial development along its eastern half. Habitats within the Carquinez Regional Shoreline in Segment 2 of the survey area include willow riparian, coastal scrub, oak woodland, and freshwater and brackish marshes, comprised by suballiance wetland communities. The northeast end of Segment 2 occurs at the railroad crossing at Berrellesa Street, and is surrounded by industrial, commercial, and residential development.

2.1.1 Hydrology

The Project begins in the Carquinez Drainages Watershed at the Nejedly Staging Area and ends approximately 0.5-mile downhill (northeast) at the junction of the UPRR tracks/right-of-way and Berrellesa Street in the Alhambra Creek Watershed. Site elevation ranges from 50 feet above sea level (ASL) at the Nejedly Staging Area to less than 10 feet ASL along the UPRR tracks/right-of-way. Prior to construction of the UPRR tracks (pre-1939), the bayside slopes and canyons of the hills surrounding the Project drained directly into the marshes lining the south shoreline of the Carquinez Strait. Under current conditions, areas of freshwater and brackish marsh occur throughout Segment 2 of the survey area, predominantly within an ephemeral, low flow channel that formed as a result of the railroad construction (**Figure 2.1 and Figure 2.2**). The Arroyo del Hambre, a stream connecting inland Alhambra Creek to the Carquinez Straight/Suisun Bay, occurs approximately 96 feet east of the northeast end of Segment 2 of the survey area.

2.1.2 Soils

Three soil types occur in the survey area. General descriptions of these soils are summarized from the descriptions provided in the Natural Resources Conservation Service Web Soil Survey Soil Survey (USDA 2021):

- *Los Gatos loam* (*LeF*), 30 to 50 percent slopes—mapped in 25% of the survey area; on upland slopes and results from weathered sedimentary rock with high runoff potential/ well-drained soils.

- *Los Gatos loam* (*LeG*), 50 to 75 percent slopes—mapped in 38% of the survey area; on upland slopes and results from weathered sedimentary rock with high runoff potential/well-drained soils.
- *Omni silty clay* (*Ob*)—mapped in 37% of the survey area; on flood plains and results from alluvium derived from sedimentary rock with medium runoff potential and moderately to strongly saline.

2.2 Vegetation Communities

The following vegetation communities occur in the survey area:

2.2.1 Ruderal

Ruderal vegetation is characterized by the presence of sparse to dense nonnative annual grasses and weedy annual forbs that have colonized an area following human disturbance (Holland, 1986). Ruderal vegetation occurs in Segment 2 of the survey area adjacent to the UPRR right-of-way and is widespread along its eastern portion. Ruderal vegetation in the survey area is dominated by nonnative grasses, including ripgut brome (*Bromus diandrus*) and red brome (*Bromus madritensis* ssp. *rubens*), with some native coastal gumweed (*Grindelia stricta*).

2.2.2 Eucalyptus Grove

Eucalyptus grove habitat occurs in Segment 1 of the survey area between the Nejedly Staging Area and the pedestrian bridge. Eucalyptus groves or *Eucalyptus* (*globulus*, *camaldulensis*) Semi-Natural Woodland Stands in the survey area are dominated by blue gum (*E. globulus*) (Sawyer et al. 2009). Eucalyptus grove habitat in the survey area is contiguous with the wild oats and annual brome grassland habitat, and understory vegetation is dominated by nonnative grasses and forbs, including oats (*Avena* spp.), ripgut brome, bull thistle (*Cirsium vulgare*), and black mustard (*Brassica nigra*).

2.2.3 Wild Oats and Annual Brome Grassland

Wild oats and annual brome grassland habitat, or *Bromus diandrus-Avena* spp. Semi-Natural Herbaceous Stands (Sawyer et al. 2009), occurs within openings in eucalyptus grove habitats in the survey area. This habitat is present in portions of both the understory of the eucalyptus grove and coast live oak woodlands. Nonnative grasses, including wild oats, ripgut brome, smilo grass, (*Stipa miliaceae*) soft brome (*Bromus hordeaceus*), and red brome dominate this habitat. Other nonnatives are also common in the herbaceous layer, such as black mustard, California burclover (*Medicago polymorpha*), cutleaf geranium (*Geranium dissectum*), English plantain (*Plantago lanceolata*) and summer mustard (*Hirschfeldia incana*). Isolated stands of poison oak

(*Toxicodendron diversilobum*) and Himalayan blackberry (*Rubus armeniacus*) also occur within wild oats and brome grassland.

2.2.4 Creeping Ryegrass Turf

A patch of creeping ryegrass turf, or *Elymus triticoides* Herbaceous Alliance (Sawyer et al. 2009), is present in the survey area immediately north of the pedestrian bridge. This vegetation community spans a grassy slope at the base of a northeast-facing hillside and is directly adjacent to the riparian corridor (**Figure 2.1**). Creeping ryegrass turf in the survey area is dominated by the native wild rye species *Elymus* (= *Leymus*) *triticoides*. Other native grasses and forbs also occur, such as nodding needle grass (*Stipa cernua*), native rushes (*Juncus* sp.), and mugwort (*Artemesia douglasiana*). Nonnatives also occur in the herbaceous layer, including wild oats (*Avena fatua*), Italian rye grass (*Festuca perennis*), poison hemlock (*Conium maculatum*) and teasel (*Dipsacus sativus*). Low shrub cover comprised of coyote brush (*Baccharis pilularis*) was also present in this vegetation community within the survey area.

2.2.5 Coast Live Oak Woodland

The overstory of the coast live oak woodland, or *Quercus agrifolia* Woodland Alliance (Sawyer et al. 2009), in the survey area is dominated by coast live oak (*Quercus agrifolia*). Other tree species including California bay (*Umbellularia californica*), California walnut (*Juglans californica*), and arroyo willow (*Salix lasiolepis*) are also present. The understory is sparsely vegetated to bare and becomes denser near the pedestrian bridge and in the western half of Segment 2 towards Berrellesa Street. The understory supports woody shrubs and vines, including poison oak, California blackberry (*Rubus ursinus*), elderberry (*Sambucus nigra* ssp. *caerulea*), and nonnative cultivated plum (*Prunus* sp.). The herbaceous layer includes open areas of nonnative grasses and densely vegetated areas supporting a variety of forbs, including fennel (*Foeniculum vulgare*), thimbleberry (*Rubus parviflorus*), soap plant (*Chlorogalum pomeridianum*), and snowberry (*Symphoricarpos* sp.).

2.2.6 California Sagebrush Scrub

California sagebrush scrub habitat, or *Artemisia californica* shrubland alliance (Sawyer et al. 2009), occurs in the survey area on the north-facing hillside on the south side of Segment 2 (**Figure 2.1**). Coyote brush and sagebrush (*Artemesia californica*) dominate the shrub layer in this location. Native species occur within this vegetation community, including golden yarrow (*Eriophyllum confertiflorum*), common yarrow (*Achillea millefolium*), toyon (*Heteromeles arbutifolia*), two lobed clarkia (*Clarkia biloba* ssp. *biloba*), and San Antonio Hills monardella (*Monardella antonina* ssp. *antonina*). Nonnative grasses and forbs also occur in the herbaceous layer, including teasel, Smilo grass, and summer mustard.

2.2.7 Arroyo Willow Thicket

One patch of arroyo willow thicket, or *Salix lasiolepis* Woodland Alliance (Sawyer et al. 2009), occurs on the west half of Segment 2 of the survey area (**Figure 2.1**). This habitat is narrow and bordered by mature oak woodlands to the south and the UPRR right-of-way to the north. Mature arroyo willows (*Salix lasiolepis*) are dominant in this habitat and occur with dense stands of California blackberry. Coyote brush, poison oak, fennel, and plants associated with adjacent freshwater marsh habitat (described below) occur in the understory.

2.2.8 Freshwater and Brackish Marsh

Perennial freshwater and brackish marsh habitats are present in portions of the survey area along the south side of the UPRR right-of-way. These areas are predominantly adjacent to arroyo willow thicket, oak woodland, and ruderal habitats. Wetland plant communities within the survey area are dominated by strongly hydrophytic species, such as cattails (*Typha* sp.), bulrush (*Bolboschoenus* spp.), and sedges (*Cyperus* and *Carex* spp.). Freshwater and brackish marshes in the survey area are comprised of five suballiance occurrences which are described in more detail below: Yerba Mansa Alkaline Wet Meadow, Smartweed Cocklebur Patches, Cattail Marsh, Hardstem and California Bulrush Marsh, and Saltgrass Flats. Two of these are considered Sensitive Natural Communities: Yerba Mansa Alkaline Wet Meadow and Hardstem and California Bulrush Marshes.

Yerba Mansa Alkaline Wet Meadow

The California Native Plant Society (CNPS) describes the Yerba Mansa Alkali Wet Meadow community as *Anemopsis californica, Helianthus nuttallii, Solidago confinis and/or Solidago spectabilis* being dominant or co-dominant in the herbaceous layer with *Ambrosia psilostachya, Bromus hordeaceus, Carex praegracilis, Carpobrotus edulis, Cirsium occidentale, Distichlis spicata, Euthamia occidentalis, Holocarpha virgata, Hordeum murinum ssp. leporinum, Juncus arcticus, Juncus cooperi, Juncus rugulosus, Lactuca serriola, Leymus triticoides, Lolium perenne, Medicago polymorpha, Rumex crispus, Schoenoplectus americanus, Sisyrinchium bellum* and *Sporobolus airoides* (CNPS 2021b). This alliance has a rarity listing of S2 which indicates it is fairly rare and threatened. This habitat type occurred in only one location in a ponded segment of the low flow channel in Segment 2 of the survey area (**Figure 2.1**). Early growth of *Anemopsis californica* at approximately 30% cover with the remaining cover composed of cocklebur, algal matting, mud, or water was observed in this location in 2020 (Swaim 2020b) and during the March 2021 rare plant survey. During the August 2021survey gravel fill had been placed in the area that formerly contained this vegetation community and the plants associated with it were no longer visible.

Smartweed Cocklebur Patches

CNPS describes the Smartweed Cocklebur Patches community as *Polygonum lapathifolium* and/or *Xanthium strumarium* or other knotweed species being dominant or co-dominant in the herbaceous layer with *Bidens frondosa, Cuscuta pentagona, Echinochloa spp., Eleocharis macrostachya, Euthamia occidentalis, Helianthus annuus, Phyla nodiflora* and *Polygonum* spp. (CNPS 2021b). Common cocklebur (*Xanthium strumarium)* occurs particularly in disturbed areas such as seasonally flooded streamsides and alluvial flats. Smartweed Cocklebur Patches occur in the open herbaceous areas in Segment 2 of the survey area as a stand-alone species or in conjunction with *Juncus, Carex, Cyperus, Elymus, Rumex, Distichlis,* and *Grindelia*, among others.

Cattail Marsh

CNPS describes the Cattail Marshes community as *Typha angustifolia, Typha domingensis* or *Typha latifolia* being dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera, Argentina egedii, Cyperus spp., Distichlis spicata, Echinochloa crus-galli, Eleocharis macrostachya, Equisetum telmateia, Juncus spp., Lemna minuta, Lepidium latifolium*, *Oenanthe sarmentosa, Persicaria lapathifolia, Persicaria punctata, Phragmites australis, Schoenoplectus americanus, Schoenoplectus californicus, Typha × glauca* and *Xanthium strumarium* (CNPS 2021b). Within the survey area, this community is comprised of the non-native narrowleaf cattail (*Typha angustifolia*) and tends to occur in the open herbaceous areas downstream as exclusive patches.

Hardstem and California Bulrush Marshes

CNPS describes the Hardstem and California Bulrush Marshes community as *Schoenoplectus acutus* and/or *Schoenoplectus californicus* being dominant or co-dominant in the herbaceous layer with *Apocynum cannabinum, Azolla filiculoides, Bolboschoenus maritimus, Calystegia sepium, Eichhornia crassipes, Euthamia occidentalis, Hibiscus lasiocarpos, Hoita macrostachya, Hydrocotyle ranunculoides, Leersia oryzoides, Ludwigia peploides, Lycopus americanus, Persicaria punctata, Phragmites australis, Sparganium eurycarpum, Triglochin spp., Typha angustifolia, Typha domingensis, Typha latifolia* and *Urtica dioica* (CNPS 2021b). This alliance is considered a Sensitive Natural Community and has a rarity listing of S3, which indicates it is moderately rare and threatened. It occurs primarily as an understory community beneath the arroyo willow thicket, becoming most prominent at the downstream end of the ephemeral, low flow channel (**Figure 2.1**).

Salt Grass Flats

CNPS describes the Salt Grass Flats community as *Distichlis spicata, Juncus acutus* and/or *Juncus cooperi* being dominant or co-dominant in the herbaceous layer with *Agrostis viridis, Ambrosia chamissonis, Anemopsis californica, Atriplex prostrata, Batis maritima, Bromus diandrus, Cotula coronopifolia, Eleocharis palustris, Frankenia salina, Hordeum brachyantherum, Hordeum*

murinum, Jaumea carnosa, Juncus acutus, Juncus arcticus, Juncus cooperi, Lepidium latifolium, Leymus triticoides, Limonium californicum, Muhlenbergia asperifolia, Parapholis strigosa, Pascopyrum smithii, Poa secunda, Puccinellia nuttalliana, Sarcocornia pacifica, Sporobolus airoides or *Triglochin maritima* (CNPS 2021b). Within the survey area, this community occurs in the seasonal wetland at the downstream terminus of the low-flow channel in the eastern half of Segment 2.

2.2.9 Developed

Developed land cover occurs in Segment 2 of the survey area and includes paved portions of Berrellesa Street, UPRR tracks, compacted gravel within the UPRR right-of-way, and industrial development on the southeast half of the trail segment. Developed land cover in the outer edges of the survey area include paved Berrellesa Street and Carquinez Scenic Drive. Areas within the UPRR right-of-way are largely devoid of vegetation.

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3. Methods

Floristic surveys followed protocols described in the following guidelines:

- *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (California Department of Fish and Game [CDFG], 2018);
- *CNPS Botanical Survey Guidelines* (California Native Plant Society [CNPS], 2001); and
- *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (U.S. Fish and Wildlife Service [USFWS], (1996).

3.1 Background Research

SBI conducted a review of available background information, including local soil surveys available on the U.S. Department of Agriculture's (USDA) Web Soil Survey, historical aerial photographs obtained using Google Earth, and a search and review of the California Natural Diversity Data Base (CNDDB) within an approximately five-mile radius of the site (CNDDB 2021). The CNDDB data was used to evaluate the documented occurrences of special-status plant and natural communities (or plant communities) of special concern in proximity to the survey area. In addition, the CNPS Inventory of Rare Plants of California (database) was used to search the Benicia USGS quadrangle maps and the USGS quadrangles maps directly adjacent (CNPS 2021a).

3.2 Reference Site Visits

On August 4, 5 and 11, 2021, SBI biologists Natasha Dvorak and Matt Beyers visited known reference site populations of special status plants in Contra Costa County, including crownscale

(*Atriplex coronata* var. *coronata*), big tarplant (*Blepharizonia plumosa*), western leatherwood (*Dirca occidentalis*), San Joaquin spearscale (*Extriplex joaqinana*) and oval-leaved viburnum (*Virburnum ellipticum*). Crownscale, western leatherwood, San Joaquin speascale, and oval-leaved viburnum were all observed at known reference sites visited. Although the annual blooming periods for western leatherwood and oval-leaved viburnum had passed, these species of shrub were positively identified by over-ripe, dry fruits and other dry floral parts, as well as with vegetation and bark, which is unique and distinctive in both species. A known population of San Joaquin spearscale was observed at the same reference site location where crownscale was observed and previously recorded within the Los Vaqueros Watershed, east of Mount Diablo. A population of *Blepharizonia* was observed along a trail at a reference site in EBRPD Black Diamond Mines Regional Preserve. The population observed was immature with no mature reproductive structures (i.e., flowers/fruits) to observe to make a positive identification of big tarplant at the time of this survey. A common species, glandular big tarweed (*Blepharizonia laxa*), occurs within the same range as big tarplant in much of Contra Costa County and mature flowers (and preferably fruits) are necessary to correctly identify to species and differentiate between the rare and common tarplant. None of the species surveyed for or observed at known populations/reference sites were observed in the survey area.

3.3 Surveys

Three rounds of floristic surveys were conducted to encompass the annual blooming periods of target special-status species with potential to occur onsite. The surveys were conducted on March 26, 2021, by SBI biologists Natasha Dvorak and Bridget Sousa, and on June 2 and August 11, 2021, by Natasha Dvorak and botanist Matt Beyers. The survey area included Segment 1 and Segment 2 of the trail alignment including a surrounding 50-foot buffer zone, starting just south of Carquinez Scenic Drive at Nejedly Staging Area to approximately 0.5-mile northeast at the junction of the UPRR right-of-way and Berrellesa Street (**Figure 2.1** and **Figure 2.2**). Surveying biologists walked parallel transects spaced approximately 15 feet apart to ensure 100 percent visual coverage within the survey area. All plants encountered, whether living or dead, were identified to the most specific taxonomic level possible.

4. Results

4.1 Rare Plant Occurrences

During June and August surveys, special status plants two lobed clarkia (*Clarkia biloba* ssp. *biloba*), and San Antonio Hills monardella (*Monardella antonina* ssp. *antonina*) were observed in the survey area. Two lobed clarkia is considered locally rare by the California Native Plant Society's East Bay Chapter (ranked A2) and is therefore reviewed under the California

Environmental Quality Act (CEQA). A population of two lobed clarkia was observed on a steep, north-facing hillside on the south side of the western half of Segment 2 of the survey area, as an understory species within California sagebrush scrub and coinciding with a population of San Antonio Hills monardella. A population of San Antonio Hills monardella, California Rare Plant Rank (CRPR) 3, was observed in the survey area at the same location as the two-lobed clarkia population within California sagebrush scrub.

Another population of San Antonio Hills monardella was observed just outside the survey area, immediately along the northwest side of Segment 1 on a north-northeast-facing hillside within wild oats and annual brome grassland and coastal scrub habitat (**Figure 2.1**)

4.2 Sensitive Natural Communities

Three sensitive natural communities were observed in the survey area, consisting of Creeping Ryegrass Turf, Yerba Mansa Alkaline Wet Meadow, and Hardstem and California Bulrush Marsh. See Section 2.2 for descriptions of the plant species associated with these communities.

The Creeping Ryegrass Turf community has membership rules that vary from 30% to 50% relative cover in the herbaceous layer and a rarity listing of S3 which indicates it is moderately rare and threatened (CNPS 2021b). In the survey area, there is a small (0.05 acre) stand where *Elymus triticoides* is dominant in the herbaceous layer at greater than 50% relative cover. The Creeping Ryegrass Turf community continues under the edge of the riparian canopy and extends uphill toward the California sagebrush community just beyond the northwest side of Segment 1 of the survey area (**Figure 2.1**).

The Hardstem and California Bulrush Marshes community has membership rules requiring that *Schoenoplectus acutus* or *Schoenoplectus californicus* > 50% cover in the herbaceous layer or > 30% relative cover if codominant with *Typha* spp. It has a rarity listing of S3 which indicates it is moderately rare and threatened (CNPS 2021b). The Hardstem and California Bulrush Marsh alliance occurs as an understory community beneath the arroyo willow thicket extending downstream to the open herbaceous area on the west half of Segment 2 of the survey area (**Figure 2.1**).

The Yerba Mansa Alkali Wet Meadow community has a rarity listing of S2 which indicates it is fairly rare and threatened (CNPS 2021b). In the lower reaches of the low flow channel in Segment 2 of the survey area, there was a ponded segment measuring approximately 100 square feet that, at the time of the May 2021 survey, exclusively supported the early growth of *Anemopsis californica* at approximately 30% cover (**Figure 2.1**). During the June and August 2021 rare plant surveys, the location where this sensitive natural wetland community was previously observed had been covered with rock fill within the UPRR right-of-way. The community was not observed where it had been previously mapped and recorded in Segment 2 of the survey area.

5. Literature Cited

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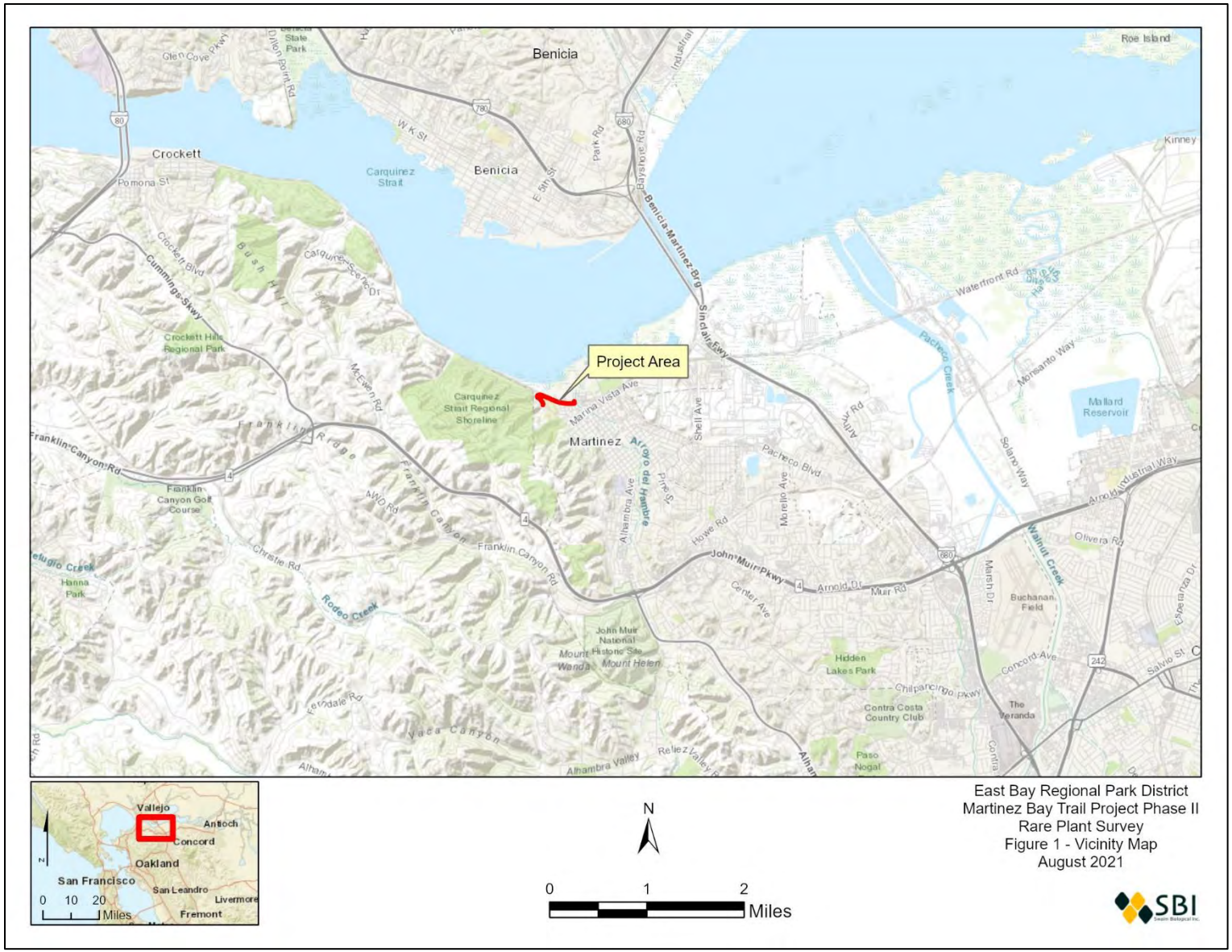

Figure 1. Martinez Bay Trail Phase II Project location and vicinity.

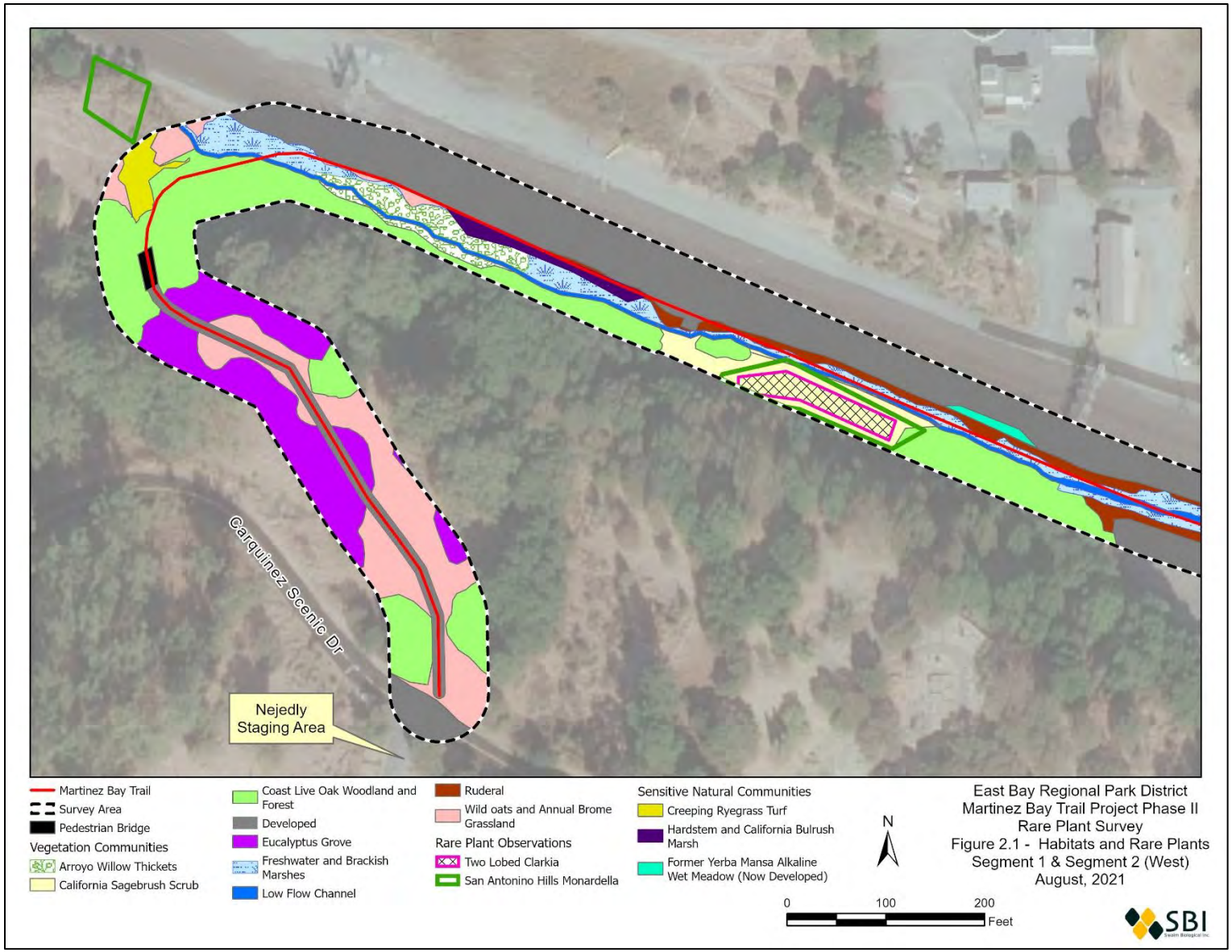

Figure 2.1. Martinez Bay Trail Phase II Project, Segment 1 and Segment 2 (West) survey area showing plant communities and rare plant populations.

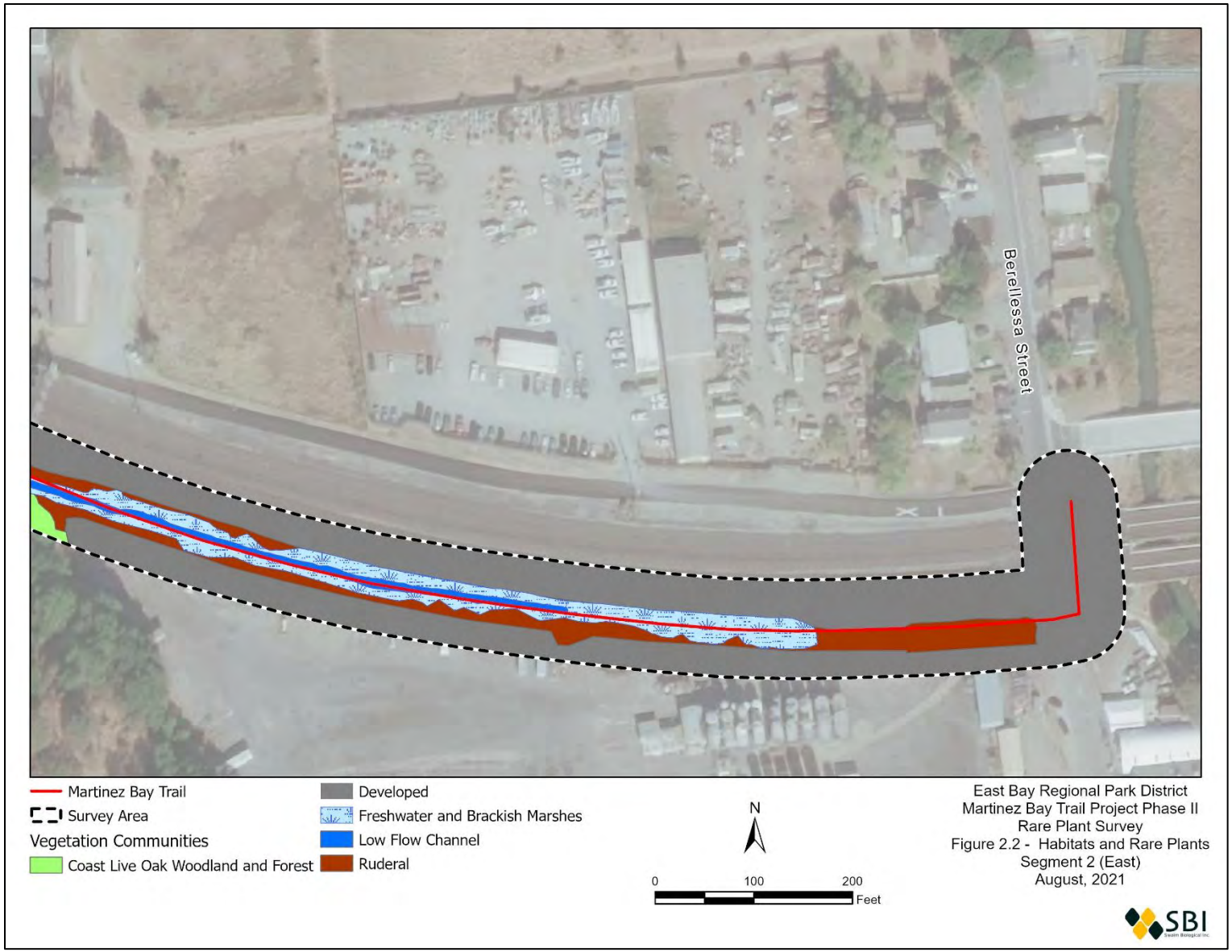

Figure 2.2. Martinez Bay Trail Phase II Project, Segment 2 (East) survey area showing plant communities and rare plant populations.

APPENDIX A. Special Status Plant Species and Plant Communities Potentially Occurring in the Survey Area

Scientific Name	Common Name	Status[1]	General Habitat Requirements	Typical Blooming Period	2021 Survey Results
Amsinckia lunaris	bent-flowered fiddleneck	1B.2	Cismontane woodland, valley and foothill grassland, and coastal bluff scrub; damp rock and soil on outcrops and cliffs within broadleaved upland forest, lower montane coniferous forest and north coast coniferous forest; often on acidic substrates. Known elevations are between 325-3280 ft elevation.	Mar-Jun	Not observed.
Androsace elongata ssp. *acuta*	California androsace	4.2	Chaparral, Cismontane woodland, Coastal scrub, Meadows and seeps, Pinyon and juniper woodland, Valley and foothill grassland	Mar-Jun	Not observed.
Arctostaphylos pallida	pallid manzanita	FT/SE 1B.1	Siliceous shale, sandy or gravelly soils in broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub within the Diablo Range at known elevations between 605-1525 ft. elevation. Perennial evergreen shrub.	Dec-Mar	Not observed
Atriplex coronata var. *coronata*	crownscale	4.2	Alkaline, often clay soils in chenopod scrub, valley and foothill grassland, and vernal pools.	Mar-Oct	Not observed.
Blepharizonia plumosa	big tarplant	1B.1	Valley and foothill grassland, usually clay soils	Jul-Oct	Not observed.
Calochortus pulchellus	Mt. Diablo fairy-lantern	1B.2	Occurs on north-facing wooded slopes in riparian woodland, and valley and foothill grassland, rarely within chaparral, at elevations between 100-2755 ft.	Apr-Jun	Not observed.
Calochortus umbellatus	Oakland star-tulip	4.2	Often serpentine soils in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland at elevations of 328-2,297 ft.	Mar-May	Not observed.
Castilleja ambigua var. *ambigua*	johnny-nip	4.2	Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools margins	Mar-Aug	Not observed.

APPENDIX A. Special Status Plant Species and Plant Communities Potentially Occurring in the Survey Area

Scientific Name	Common Name	Status[1]	General Habitat Requirements	Typical Blooming Period	2021 Survey Results
Clarkia biloba ssp. *biloba*	two lobed clarkia	EB CNPS A2	Occurs on serpentine or not; coniferous forest, foothill woodland, and chaparral	May-Aug	**Present**. Observed as an understory species within California sagebrush scrub on a steep, north-facing hillside on the south side of the western half of Segment 2 of the study area.
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	1B.1	Often alkaline soils in chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, and vernally mesic valley and foothill grassland, at elevations of 3-750 ft.	May-Oct (Nov)	Not observed.
Chloropyron molle ssp. *molle*	soft bird's-beak	FE/SR 1B.2	Marshes and swamps (coastal)	Jun-Nov	Not observed.
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	2B.1	Marshes and swamps: coastal, fresh or brackish water	Jul-Sep	Not observed.
Cirsium andrewsii	Franciscan thistle	1B.2	Broadleafed upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub; mesic, sometimes serpentine soils	Mar-Jul	Not observed.
Dirca occidentalis	western leatherwood	1B.2	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, North Coast coniferous forest, Riparian forest, Riparian woodland; mesic soils	Jan-Mar (Apr)	Not observed.
Eleocharis parvula	small spikerush	4.3	Marshes and swamps	(Apr) Jun-Aug (Sep)	Not observed.
Eryngium jepsonii	Jepson's coyote thistle	1B.2	Occurs in wetlands below 1,640 ft elevation on moist clay soil.	Apr-Aug	Not observed.
Extriplex joaquinana	San Joaquin spearscale	1B.2	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland; alkaline soils	Apr-Oct	Not observed.
Fissidens pauperculus	minute pocket moss	1B.2	North Coast coniferous forest (damp coastal soil)	N/A	Not observed.
Fritillaria liliacea	fragrant fritillary	1B.2	Often serpentinite soils in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland, at elevations of 10- 1,345 ft.	Feb-Apr	Not observed.

APPENDIX A. Special Status Plant Species and Plant Communities Potentially Occurring in the Survey Area

Scientific Name	Common Name	Status[1]	General Habitat Requirements	Typical Blooming Period	2021 Survey Results
Helianthella castanea	Diablo helianthella	1B.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland, Valley and foothill grassland; usually rocky, axonal soils. Often in partial shade	Mar-Jun	Not observed.
Holocarpha macradenia	Santa Cruz tarplant	FT/SE 1B.1	Occurs in coastal prairie, coastal scrub and valley and foothill grasslands, in areas with light sandy soil, or sandy clay between 30-720 ft. elevation.	Jun-Oct	Not observed.
Iris longipetala	coast iris	4.2	Coastal prairie, Lower montane coniferous forest, Meadows and seeps; mesic soils	Mar-May	Not observed
Isocoma arguta	Carquinez goldenbush	1B.1	Generally found in wetlands within valley and foothill grassland, usually within alkali flats or other mineral-rich soils of the Suisun Slough at elevations of 3-65 ft.	Aug-Dec	Not observed.
Lasthenia conjugens	Contra Costa goldfields	FE/— 1B.1	Mesic habitats including cismontane woodland, alkaline playas, valley and foothill grasslands, and vernal pools, at elevations of 0- 1,542 ft.	Mar-Jun	Not observed.
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	1B.2	Low elevation marshes and swamps (freshwater and brackish)	May-Jul (Aug-Sep)	Not observed.
Lilaeopsis masonii	Mason's lilaeopsis	—/SR 1B.1	Marshes and swamps (brackish or freshwater), Riparian scrub	Apr-Nov	Not observed.
Meconella oregana	Oregon meconella	1B.1	Coastal prairie and scrub between 820-2035 ft. elevation.	Mar-Apr	Not observed.
Micropus amphibolus	Mt. Diablo cottonweed	3.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Valley and foothill grassland; rocky soils	Mar-May	Not observed.
Monardella antonina ssp. antonina	San Antonio Hills monardella	3	Chaparral and cismontane woodland at elevations of 1050-3281 ft.	Jun-Aug	**Present.** Observed within California sagebrush scrub on a steep, north-facing hillside on the south side of the western half of Segment 2 of the survey area and just outside the survey area along the buffer zone west of Segment 1.
Navarretia gowenii	Lime Ridge navarretia	1B.1	Chaparral at elevations of 591-1001 ft.	May-Jun	Not observed.
Polygonum marinense	Marin knotweed	3.1	Marshes and swamps (coastal salt or brackish)	(Apr) May-Aug (Oct)	Not observed.

APPENDIX A. Special Status Plant Species and Plant Communities Potentially Occurring in the Survey Area

Scientific Name	Common Name	Status[1]	General Habitat Requirements	Typical Blooming Period	2021 Survey Results
Ranunculus lobbii	Lobb's aquatic buttercup	4.2	Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools; mesic soils	Feb-May	Not observed.
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	1B.2	Alkaline marshes, mud flats, meadows, and hot springs between 0-670 ft. elevation.	Feb-May (Jun)	Not observed.
Streptanthus albidus ssp. peramoenus	most beautiful jewelflower	1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; serpentine soils	(Mar) Apr-Sep (Oct)	Not observed.
Symphyotrichum lentum	Suisun Marsh aster	1B.2	Marshes and swamps (brackish and freshwater)	(Apr) May-Nov	Not observed.
Trifolium hydrophilum	saline clover	1B.2	Salt marsh and swamp, vernal pool or other wetlands within valley and foothill grassland on alkaline soils at elevations of 0-985 ft.	Apr-Jun	Not observed.
Viburnum ellipticum	oval-leaved viburnum	2B.3	Chaparral, cismontane woodland, and lower montane coniferous forest at elevations of 705-4,595 ft.	May-Jun	Not observed.
Sensitive Plant Communities					
Leymus cinereus - Leymus triticoides Herbaceous Alliance	Creeping Ryegrass Turfs	S3	*Leymus cinereus* and/or *Leymus triticoides* (=*Elymus triticoides*) is dominant or co-dominant in the herbaceous layer. Emergent trees and shrubs may be present at low cover. Membership rules vary from 30% to 50% relative cover in the herbaceous layer.	N/A	**Present.** This community is present at the north pedestrian bridge footing, continuing north across a grassy slope on the northwest side of Segment 1 and east under the riparian canopy along the stream channel.
Anemopsis californica - Helianthus nuttallii - Solidago spectabilis Alkaline Wet Meadows	Yerba Mansa Alkaline Wet Meadows	S2	*Anemopsis californica, Helianthus nuttallii, Solidago confinis* and/or *Solidago spectabilis* is dominant or co-dominant in the herbaceous layer. Membership rules require 30% cover in the herbaceous layer.	N/A	**Present.** This community is restricted to a small area (100 sq. ft.) near the middle of the low flow channel on the west half of Segment 2 of the survey area. During June and August 2021 rare plant surveys, the location where this sensitive natural wetland community was previously observed had been covered with rock fill and was not observed where it had been previously mapped and recorded in the survey area during March 2021 rare plant surveys.

APPENDIX A. Special Status Plant Species and Plant Communities Potentially Occurring in the Survey Area

Scientific Name	Common Name	Status[1]	General Habitat Requirements	Typical Blooming Period	2021 Survey Results
Schoenoplectus (acutus, californicus) Marshes	Hardstem and California Bulrush Marshes	S3	*Schoenoplectus acutus* and/or *Schoenoplectus californicus* is dominant or co-dominant in the herbaceous layer. Membership rules require that *Schoenoplectus acutus* or *Schoenoplectus californicus* > 50% cover in the herbaceous layer or > 30% relative cover if codominant with *Typha* spp.	N/A	**Present.** This community is present primarily as an understory community beneath the arroyo willow thicket, becoming most prominent at the downstream end as the overstory canopy declines. It is restricted to a small area (300 sq. ft.) within the low flow channel within the survey area.

[1]Federal Endangered Species Act (FESA) Designations: (FE) Federally Endangered
California Endangered Species Act (CESA) Designations: (SE) State Endangered
California Native Plant Society (CNPS) Rare Plant Rank: (1A) Presumed extinct in California; (1B) Rare, threatened, or endangered in California and elsewhere; (2) Rare, threatened, or endangered in California, but more common elsewhere; (3) More information is needed; (4) Limited distribution, watch list; Threat Rank: 0.1 Seriously threatened in California (more than 80% of occurrences threatened / high degree and immediacy of threat); 0.2 Fairly threatened in California (20 to 80% occurrences threatened/moderate degree and immediacy of threat); 0.3 Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known.

APPENDIX B. List of Plants Observed within the Survey Area

PLANTS	
Scientific Name	**Common Name**
Achillea millefolium	yarrow
Adiantum jordanii	maiden hair fern
Aesculus californica	California buckeye
Amsinckia intermedia	common fiddleneck
Anemopsis califonica	yerba mansa
Artemisa californica	California sage brush
Artemisia douglasiana	mugwort
Asclepias fascicularis	narrow leaf milkweed
Avena barbata	slender oat
Avena fatua	wild oat
Baccharis glutinosa	Douglas' baccharis
Baccharis pilularis	coyote brush
Bolboschoenus maritumus	alkali bulrush
Bolboschoenus robustus	sturdy bullrush
Brassica nigra	black mustard
Bromus diandrus	rip gut brome
Bromus madritensis ssp. *rubens*	red brome
Capsella bursa-pastoris	shepherd's purse
Cardamine hirsuta	hairy bitter cress
Carduus pycnocephalus	Italian thistle
Centaurea melitensis	tocalote
Centaurea soltitialis	yellow star thistle
Cerastium glomeratum	sticky chickweed
Chenopodium album	lamb's quarters
Chlorogalum pomeridianum	amole
Cirsium vulgare	bull thistle
Clarkia biloba ssp. *biloba*	two lobed clarkia
Clarkia purpurea ssp. *quadrivulnera*	four spot
Clarkia unguiculata	elegant clarkia
Claytonia perfoliata	miner's lettuce
Claytonia sp.	miner's lettuce
Conium maculatum	poison hemlock
Crypsis schoenoides	Swamp grass
Cynodon dactylon	Bermuda grass
Cynosurus echinatus	hedgehog dogtail grass
Cyperus eragrostis	tall cyperus
Dactylis glomerata	orchard grass
Dichelostemma capitatum	blue dicks
Digitaria sanguinalis	crab grass
Diplacus aurantiacus	sticky monkeyflower
Dipsacus sativus	Fuller's teasel
Distichlis spicata	saltgrass
Dittrichia graveolens	stinkwort
Drymocallis glandulosa	sticky cinquefoil
Dryopteris arguta	California wood fern

APPENDIX B. List of Plants Observed within the Survey Area

PLANTS	
Scientific Name	**Common Name**
Elymus condensatus	giant wild rye
Elymus glaucus	blue wildrye
Elymus triticoides	creeping wild rye
Epilobium brachycarpum	annual fireweed
Eriogonum nudum var. *auriculatum*	naked buckwheat
Eriophyllum confertiflorum var. *confertiflorum*	golden yarrow
Erodium botrys	long beaked filaree
Erodium cicutarium	red stemmed filaree
Erodium moschatum	white stemmed filaree
Eschscholzia californica	California poppy
Eucalyptus camaldulensis	red gum
Eucalyptus globulus	blue gum
Euphorbia oblongata	eggleaf spurge
Euphorbia peplus	petty spurge
Festuca microstachys	small fescue
Festuca myuros	rattail sixweeks grass
Festuca perennis	Italian rye grass
Ficus carica	common fig
Foeniculum vulgare	sweet fennel
Galium aparine	sticky willy
Galium porrigens ssp. *porrigens*	climbing bedstraw
Galium sp.	bed straw
Genista monspessulana	French broom
Geranium dissectum	cut leaved geranium
Geranium molle	crane's bill geranium
Geranium robertianum	Robert's geranium
Grindelia camporum	common gumplant
Grindelia stricta	coastal gumplant
Helminthotheca picroides	bristly ox-tongue
Heteromeles arbutifolia	toyon
Hirschfeldia incana	summer mustard
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley
Hordeum murinum	foxtail barley
Juglans hindsii	Northern California black walnut
Juncus balticus ssp. *ater*	Baltic rush
Juncus mexicanus	Mexican rush
Lactuca serriola	wild lettuce
Lathyrus latifolius	sweet pea
Lathyrus tingitanus	Tangier pea
Lathyrus vestitus var. *vestiitus*	common pacific pea
Lepidium latifolium	broad leaved pepper grass
Lotus corniculatus	bird's foot trefoil
Lupinus bicolor	annual lupine
Lupinus nanus	sky lupine
Lupinus succulentus	succulent lupine
Lysimachia arvensis	scarlet pimpernel

APPENDIX B. List of Plants Observed within the Survey Area

PLANTS	
Scientific Name	**Common Name**
Lythrum hyssopifolia	hyssop loosestrife
Madia gracilis	grassy tarweed
Marah fabacea	California man-root
Medicago lupulina	black medic
Medicago polymorpha	bur clover
Melica californica	California melic grass
Melica torreyana	Torrey's melica
Melilotus indicus	annual yellow sweetclover
Melilotus officinalis	yellow sweetclover
Monardella antonina ssp. *antonina*	San Antonio Hills monardella
Morella caifornica	California wax myrtle
Nerium oleander	oleander
Oemleria cerasiformis	oso berry
Oxalis sp.	oxalis
Pentagramma triangularis	gold back fern
Phoenix canariensis	Canary Island date palm
Phragmites australis	common reed
Phyla nodiflora	common lippia
Plantago coronopus	cut leaf plantain
Plantago erecta	California plantain
Plantago lanceolata	English plantain
Plantago major	common plantain
Poa annua	annual blue grass
Polygonum aviculare	prostrate knotweed
Polypogon monspeliensis	rabbitsfoot grass
Prunus dulcis	almond
Prunus sp.	prunus
Quercus agrifolia	coast live oak
Quercus douglasii	blue oak
Quercus lobata	valley oak
Ranunculus californicus	California buttercup
Raphanus sativus	cultivated radish
Rosa sp.	cultivated rose
Rubus aremeniacus	Himalayan blackberry
Rubus ursinus	California blackberry
Rumex acetosella	common sheep sorrel
Rumex crispus	curly dock
Rumex obtusifolius	bitter dock
Rumex pulcher	fiddle dock
Salix lasiolepis	arroyo willow
Sambucus nigra ssp. c*aerulea*	blue elderberry
Sanicula crassicaulis	Pacific sanicle
Schinus molle	Peruvian pepper tree
Schoenoplectus acutus	hardstem bulrush
Schoenoplectus californicus	California bulrush
Scrophularia californica	California figwort
Senecio vulgaris	common groundsel

APPENDIX B. List of Plants Observed within the Survey Area

PLANTS	
Scientific Name	**Common Name**
Sidalcea malviflora	checker bloom
Silybum marianum	milk thistle
Sisymbrium officinale	hedge mustard
Sisyrinchium bellum	blue-eyed grass
Stachys bullata	California hedge nettle
Stellaria media	chickweed
Stipa cernua	nodding needle grass
Stipa miliacea	smilo grass
Taraxacum officinale	common dandy lion
Thalictrum fendleri	Fendler's meadow rue
Torilis arvensis	field hedge parsley
Toxicodendron diversilobum	poison oak
Tragopogon porriflorus	purple salsify
Trifolium hirtum	rose clover
Trifolium repens	white clover
Trifolium tomentosum	wooly clover
Triteleia laxa	Ithuriel's spear
Typha angustifolia	narrow leaf cattail
Umbellularia californica	California bay
Vicia benghalensis	purple vetch
Vicia sativa	spring vetch
Vicia villosa	hairy vetch
Vitis sp.	cultivated grape
Washingtonia robusta	Mexican fan palm
Xanthium strumarium	rough cocklebur