



RARE PLANT SURVEY REPORT
GRADY RANCH, MARIN COUNTY, CALIFORNIA

September 2011

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TABLE OF CONTENTS

1.0 INTRODUCTION..... 1
 1.1 Study Area Description..... 1
 1.1.1 Vegetation..... 1
 1.1.2 Soils..... 5
2.0 METHODS..... 6
 2.1 Background Data..... 6
 2.2 Previous Studies..... 7
 2.3 Field Survey..... 8
3.0 RESULTS..... 8
 3.1 Background Data Search Results..... 8
 3.2 Field Survey Results..... 11
4.0 CONCLUSION..... 11
5.0 REFERENCES..... 12

LIST OF FIGURES

Figure 1. Study Area Location Map..... 2
Figure 2. Biological Communities Observed in the Study Area..... 3
Figure 3. Study Area Soils Map and Special Status Plant Occurrences..... 9

LIST OF APPENDICES

- Appendix A - List of Observed Plant Species
- Appendix B - Potential for Special Status Plant Species to Occur in the Study Area

1.0 INTRODUCTION

This report presents the results of focused plant surveys conducted on the Grady Ranch property (Study Area) northwest of the City of San Rafael, Marin County, California (Figure 1). The Grady Ranch Property is located on Lucas Valley Road, approximately four miles west of U.S. Highway 101. The purpose of the survey was to update a previous survey performed on the Grady Ranch site in the early 1990s.

The surveys were conducted on March 17, May 31, and August 18, 2011 and consisted of six person-days of surveys, or approximately 50 person-hours. No special status plant species were observed within the Study Area. However, one special status plant, Tiburon buckwheat (*Eriogonum luteolum* var. *caninum*, CNPS List 1B) was observed approximately 200 feet north of the Study Area, on the larger Grady Ranch property.

This report updates a previous biological resources assessment and rare plant survey conducted by LSA in 1992 for preparation of the 1992 EIR (Nichols-Berman 1996).

1.1 Study Area Description

The 109-acre Study Area represents approximately 46 percent of the larger Grady Ranch Property, and is bounded by Lucas Valley Road to the south, and the Grady Ranch Property boundary to the east. The Study Area boundaries to the north and west were placed in order to encompass the total area of potential impacts under the proposed development project and do not represent the Grady Ranch Property boundary. The Study Area includes open space consisting of vegetation communities including bay/oak woodland and native perennial and non-native annual grasslands. Land uses adjacent to the Study Area include a low-density residential development to the east, open space/rural development to the south, and open space to the north and west on the remainder of the Grady Ranch Property. Elevations range from approximately 70 to 150 meters. A more thorough discussion of the biological communities that occur in the Study Area is included below.

1.1.1 Vegetation

Table 1 summarizes the area of each biological community type observed in the Study Area. Biological communities in the Study Area include non-native annual grassland, oak-California bay woodland, riparian wetlands, Central Coast riparian scrub, seasonal freshwater emergent wetlands, perennial freshwater emergent wetlands and Valley needlegrass grassland. Descriptions for each biological community are contained in the following sections.

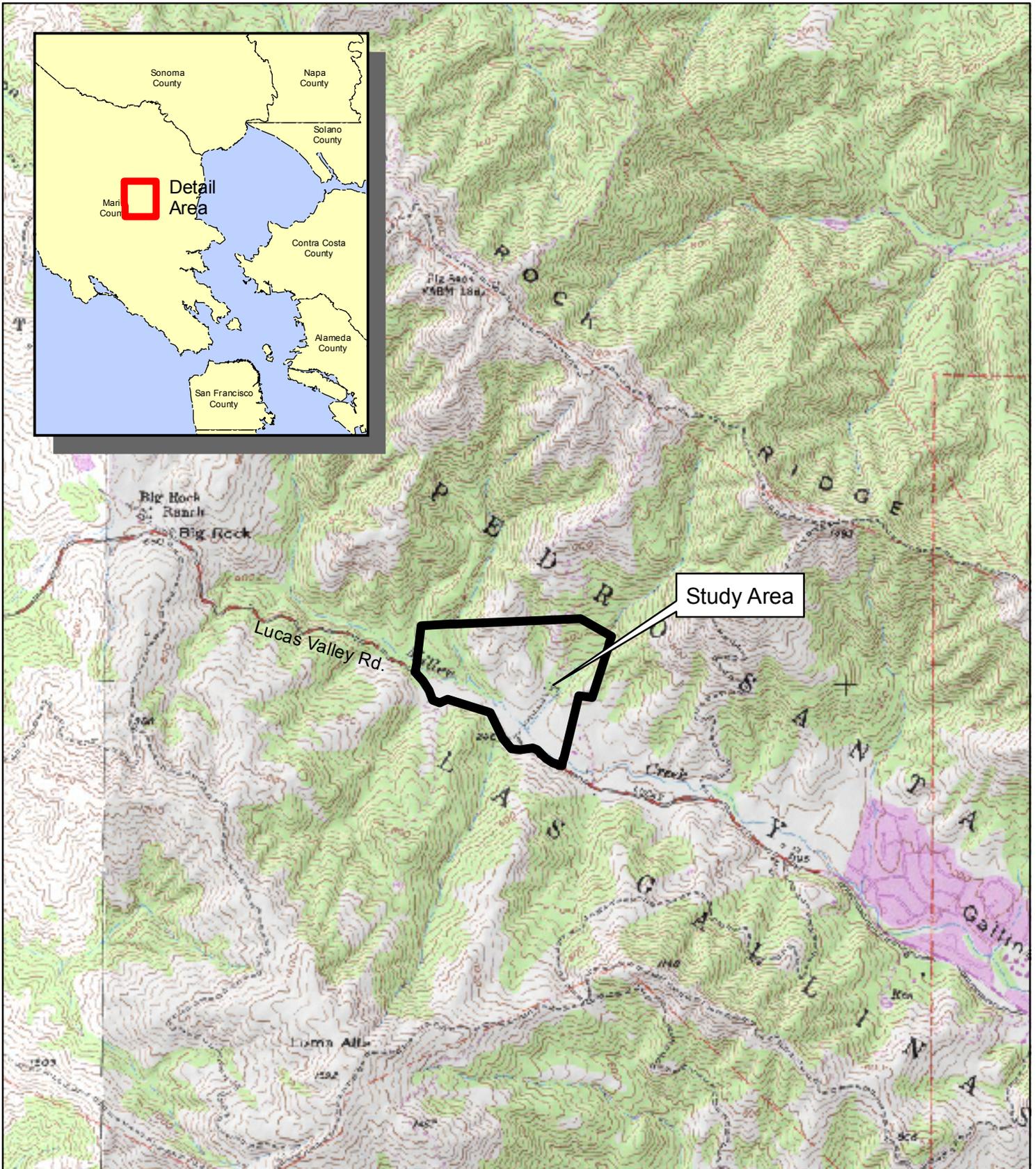
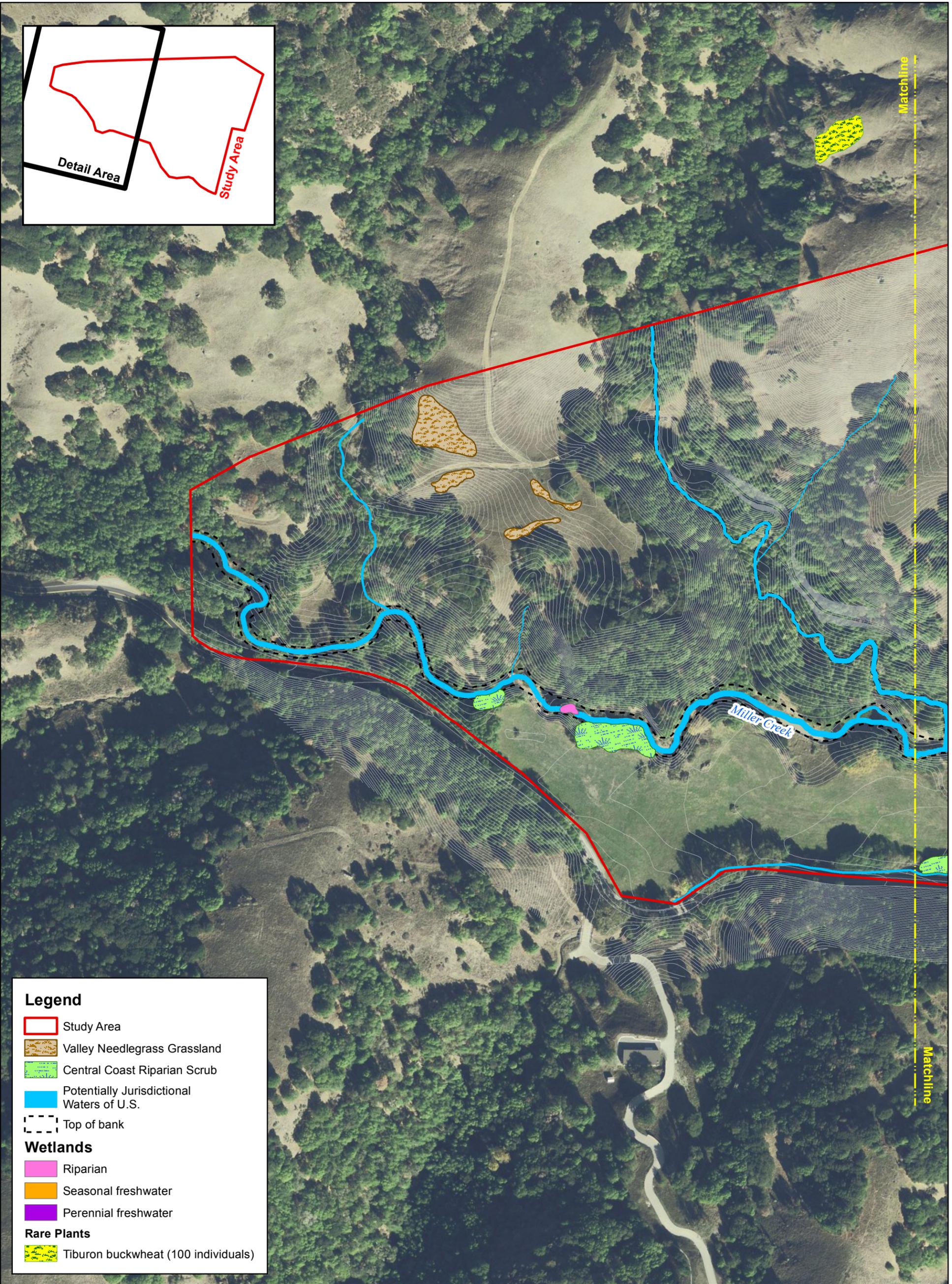


Figure 1. Study Area Location Map

Grady Ranch
Marin County, California



Date: September 2008
Image Source: USGS Topo Quad
Map By: Derek Chan
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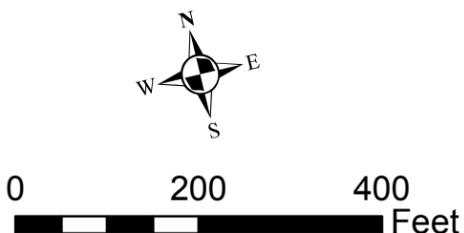


Legend

- Study Area
- Valley Needlegrass Grassland
- Central Coast Riparian Scrub
- Potentially Jurisdictional Waters of U.S.
- Top of bank
- Wetlands**
- Riparian
- Seasonal freshwater
- Perennial freshwater
- Rare Plants**
- Tiburon buckwheat (100 individuals)

Figure 2a. Biological Communities and Observed Rare Plants within the Grady Ranch Study Area

Grady Ranch
Marin County, California



ENVIRONMENTAL CONSULTANTS

Date: September 2011
Image Source: Marin County, 2004
Map By: Derek Chan
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GIS\ArcMap\BRA\Fig2_VegComm.mxd

Non-Native Annual Grassland

Non-native annual grassland is an herbaceous plant community dominated by annual grasses that are not native to California. Grass species found in this community within the Study Area include Italian ryegrass (*Lolium multiflorum*), rat-tail fescue (*Vulpia myuros*), ripgut brome (*Bromus diandrus*), rattlesnake grass (*Briza maxima*), wild oats (*Avena* sp.), soft brome (*Bromus hordeaceus*) and harding grass (*Phalaris aquatica*). Annual and perennial wildflowers and forbs also occur in this biological community, including yarrow (*Achillea millefolium*), clover (*Trifolium* spp.), California poppy (*Eschscholzia californica*), filaree (*Erodium* spp.), lupine (*Lupinus* spp.). Non-native annual grassland is located throughout the Study Area on slopes and ridges.

Oak - California Bay Woodland

A variant of the woodland communities described in Holland (1986) occurs throughout the Study Area along and surrounding the drainages. Dominant tree species in Study Area woodlands were California bay (*Umbellularia californica*) and coast live oak (*Quercus agrifolia*). The density of trees and canopy cover varied throughout the site, with the densest stands having a sparse understory dominated by leaf litter and the most open stands having an understory of non-native annual grassland.

Riparian Wetlands

Riparian wetland plant communities are not described in Holland (1986), but occur within floodplains of rivers, creeks, and streams. Approximately 0.017 acres of wetlands found within the floodplain of Miller Creek were mapped within the Study Area. These wetlands were observed on gravel bars within the bed of Miller Creek, directly abutting the active stream channel. These wetlands generally had a dense overstory of either riparian scrub or mixed oak-bay woodland, and were dominated by woody and herbaceous wetland species including arroyo willow (*Salix lasiolepis*), California blackberry (*Rubus ursinus*), stinging nettle (*Urtica dioica*), horsetail (*Equisetum arvense*), and mugwort (*Artemisia douglasiana*).

Central Coast Riparian Scrub

This community is described as a scrubby streamside thicket, varying from open or impenetrable, dominated by willows (Holland 1986). Riparian scrub in the Study Area occurred in patches along Miller Creek and its tributaries (Figure 2). Dominant vegetation in riparian scrub communities included arroyo willow (*Salix lasiolepis*) and California blackberry (*Rubus ursinus*).

Seasonal Freshwater Emergent Wetlands

Seasonal wetland plant communities are not described in Holland (1986), but occur in swales and depressions that are ponded or saturated during the rainy season for sufficient duration to support vegetation adapted to wetland conditions. Seasonal wetlands in California are highly variable in plant composition, depending on the length of ponding or inundation. They also generally lack the plant community assemblage typical of defined marshes and vernal pools. Approximately 0.028 acres of seasonal wetlands were found in the Study Area (Figure 2) in a vegetated depression that collects flows from an ephemeral drainageway during the rainy season. This community was dominated by iris-leaf rush (*Juncus xiphioides*) and rattlesnake grass (*Briza maxima*).

Perennial Freshwater Emergent Wetlands

Approximately 0.037 acres of perennial freshwater emergent wetlands, or seep wetlands, were mapped within the Study Area (Figure 2). Seep wetlands occur in areas where subsurface water flow daylight, and soils remain perennially saturated and support vegetation adapted to wetland conditions. Seep wetlands within the Study Area were dominated by sedges (*Carex* sp.), giant chainfern (*Woodwardia fimbriata*), seep monkeyflower (*Mimulus guttatus*), tall flatsedge (*Cyperus eragrostis*), and Douglas iris (*Iris douglasiana*).

Valley Needlegrass Grassland

Valley needlegrass grassland is a mid-height (to two feet) grassland dominated by perennial, tussock forming needlegrass (*Nassella pulchra*) with native and non-native annuals occurring between the perennials and often exceeding the bunchgrasses in cover (Holland 1986). This community occurred primarily in the northeastern portion of the Study Area in stands varying in cover of needlegrass (Figure 2). Approximately 2.9 acres of valley needlegrass grassland were mapped in the Study Area. Non-native grasses and other species typical of non-native annual grassland were intermixed with the needlegrass.

1.1.2 Soils

The USDA Soil Survey for Marin County (USDA 1985) indicates that the Study Area has three native soil types: Blucher-Cole complex, 2 to 5 percent slopes; Saurin-Bonnydoon complex, 50 to 75 percent slopes; and Tocaloma-Saurin association, extremely steep (Figure 3 - Study Area Soils). No serpentine outcrops or serpentinite-derived soils are present within the Study Area.

105-Blucher-Cole complex, 2 to 5 percent slopes. Blucher and Cole soils are formed from alluvium derived from various kinds of rock. Although some serpentine material may have been present in the alluvium these soils were derived from, these soils likely do not have the potential to support serpentine-endemic special status species due to the presence of non-serpentine materials in the soil profile.

This map unit is in basins and on alluvial fans. The native vegetation is mainly annual grasses and forbs. This unit is 40 percent Blucher silt loam and 30 percent Cole clay loam. The Blucher soil is near drainageways, and the Cole soil is on basin rims and in depressional areas. This map unit is listed on the Marin County hydric soils list (1986) and the National Hydric Soils List (NRCS 2008) as having 10 percent Clear Lake hydric components in alluvial fans and basin, as well as 40 percent Blucher hydric components in depressions.

The Blucher soil is very deep and somewhat poorly drained. It formed in alluvium derived from various kinds of rock. Typically, the surface layer is grayish brown silt loam about 7 inches thick. The upper 16 inches of the underlying material is brown and pale brown loam and silt loam, and the lower part to a depth of 60 inches or more is gray and grayish brown silty clay loam and clay loam. In some areas the surface layer is silty clay loam. Permeability is moderate to a depth of 23 inches and slow below this depth. Runoff is slow. Effective rooting depth is limited by a seasonal high water table that is at a depth of 3.5 to 5 feet from December to April.

The Cole soil is very deep and somewhat poorly drained. It formed in alluvium derived from various kinds of rock. Typically the surface layer is 14 inches deep. The upper part is gray clay loam about 5 inches thick, and the lower part is dark gray silty clay loam about 9 inches thick. The subsoil to a depth of 60 inches or more is dark gray or grayish brown silty clay loam. Permeability is slow and runoff is slow. Effective rooting depth is limited by a seasonal high water table that is at a depth of 1.5 to 3 feet from November to May.

164-Saurin-Bonnydoon complex, 50 to 75 percent slopes. Saurin and Bonnydoon soils are derived from shale and/or sandstone parent material. This map unit is on uplands. The native vegetation is mainly annual grasses, forbs, and scattered shrubs. This unit is 50 percent Saurin clay loam and 40 percent Bonnydoon gravelly loam. The Saurin soil is on convex side slopes, and the Bonnydoon soil is on ridgetops.

The Saurin soil is moderately deep and well drained. It formed in material derived from shale or sandstone. Typically, the surface layer is yellowish brown clay loam about 22 inches thick. The subsoil is yellowish brown clay loam about 11 inches thick. Sandstone is at a depth of 33 inches. Depth to bedrock ranges from 20 to 40 inches. Permeability is moderate, and runoff is rapid.

The Bonnydoon soil is shallow and somewhat excessively drained. It formed in material derived predominantly from sandstone or shale. Typically, the Bonnydoon soil is grayish brown gravelly loam about 15 inches deep over sandstone. Depth to bedrock ranges from 10 to 20 inches. Permeability is moderate, and runoff is rapid.

185-Tocaloma-Saurin association, extremely steep. Tocaloma and Saurin soils are derived from sandstone and/or shale parent materials. This map unit is on uplands. Slope is 50 to 75 percent. The native vegetation is mainly hardwoods on the Tocaloma soils and annual grasses and forbs on the Saurin soils. The unit is 40 percent Tocaloma loam and 30 percent Saurin clay loam. The Tocaloma soil is on north- and east-facing side slopes and in drainageways, and the Saurin soil is on ridgetops and side slopes. According to the National Hydric Soils List (NRCS 2008), this soil has 1% unnamed hydric components in depressions.

The Tocaloma soil is moderately deep and well drained. It formed in material derived from sandstone or shale. Typically, the surface layer is grayish brown and brown loam about 19 inches thick. The subsoil is light yellowish brown very gravelly loam about 20 inches thick. Fractured bedrock is at a depth of 39 inches. Depth to bedrock ranges from 20 to 40 inches. Permeability is moderately rapid, and runoff is rapid.

The Saurin soil is moderately deep and well drained. It formed in material derived from sandstone or shale. Typically, the surface layer is yellowish brown clay loam about 22 inches thick. The subsoil is yellowish brown clay loam about 11 inches thick. Sandstone is at a depth of 33 inches. Depth to bedrock ranges from 20 to 40 inches. Permeability is moderate, and runoff is rapid.

2.0 METHODS

2.1 Background Data

Potential occurrence of special status species in the Study Area was evaluated by first determining which special status species occur in the vicinity of the Study Area through a literature and database search. Database searches for known occurrences of special status species focused on

the Novato 7.5 minute USGS quadrangle and the eight surrounding USGS quadrangles. The following sources were reviewed to determine which special status plant and wildlife species have been documented to occur in the vicinity of the Study Area:

- California Natural Diversity Database records (CNDDDB) (CDFG 2011)
- USFWS quadrangle species lists (USFWS 2011)
- CNPS Electronic Inventory records (CNPS 2011)

Appendix B presents the evaluation of potential for occurrence of each special status plant species known to occur in the vicinity of the Study Area with their habitat requirements, potential for occurrence, and rationale for the classification.

2.2 Previous Studies

LSA Surveys, 1992

Special status plant surveys were conducted by LSA in 1992 in preparation of the Project EIR (Nichols-Berman 1996). Two special status plant species were observed during this survey; Mt. Tamalpais jewelflower (*Streptanthus glandulosus* ssp. *pulchellus*) and Tiburon buckwheat (*Eriogonum luteolum* var. *caninum*). These species were encountered on a large rock outcrop at an elevation of approximately 400 feet, just north of the southern branching tributary of Miller Creek. Approximately 50 individuals of Mt. Tamalpais jewelflower were observed in a small patch of California sage scrub (*Artemisia californica*), and one individual of Tiburon buckwheat was observed near the base of the same outcrop. The EIR does not contain a location map for these observations, however the location of the sighting is described in text.

The Project EIR was prepared for the combined Grady Ranch and Big Rock Ranch project and assessed the entire Grady Ranch Property. Therefore LSA considered a much larger Study Area than that considered for this project which has been scaled down from the earlier version. Both special status plant species observed by LSA in 1992 are limited to serpentine outcrops and thin, serpentinite-derived soils. No serpentine outcrops or serpentinite-derived soils were observed in the current Study Area considered in this report.

WRA, Inc. Surveys, 2008-2010

Studies conducted by WRA, Inc. from 2008 to 2010 include a biological resources assessment (WRA 2008) and delineation of jurisdictional wetlands and waters (WRA 2010). Detailed biological community maps generated from these studies were reviewed prior to the rare plant survey field work to ensure that all potentially suitable habitats were searched.

2.3 Field Survey

The focused rare plant field surveys were conducted on March 17, May 31 and August 18, 2011. Surveys were conducted during the peak blooming periods for special status species determined to have potential to occur in the Study Area. Field surveys were performed by two botanists on each date and averaged approximately 10 hours each, therefore the entire survey effort totaled approximately 60 person-hours on the ground. Surveys were floristic in nature. All plants observed were identified using The Jepson Manual (Hickman 1993) to the taxonomic level necessary to

determine whether or not they were rare. A list of observed plant species is provided in Appendix A.

The rare plant surveys were preceded by habitat mapping field studies in July and August 2008 which covered the entire Study Area (see Biological Resources Assessment Report, WRA, 208). This prior work allowed WRA to identify habitats with potential to support the rare plant species which is where the focused surveys occurred. All rock outcrops, areas supporting thin soils, and other unique geologic areas were surveyed for the target species in detail. Non-native annual grassland habitat was surveyed for pockets of potentially good habitat as a precautionary measure, however it was evident that the habitat typing was very accurate and the target species were not found in areas dominated by non-native annual grasses.

3.0 RESULTS

3.1 Background Data Search Results

Based upon a review of the resources listed in Section 2.1, 64 special status plant species have been documented in the vicinity of the Study Area. Four of these species are known to occur within less than one mile west of the Study Area on serpentine soils (Figure 3).

Based on habitats observed on-site, the Study Area has the potential to support eleven of these species. Appendix B summarizes the potential for occurrence for each special status plant species occurring in the vicinity of the Study Area. No special status plant species have a high potential to occur in the Study Area, but eleven special status plant species have a moderate potential to occur in the Study Area. Special status plant species that have a moderate potential to occur in the Study Area are discussed below.

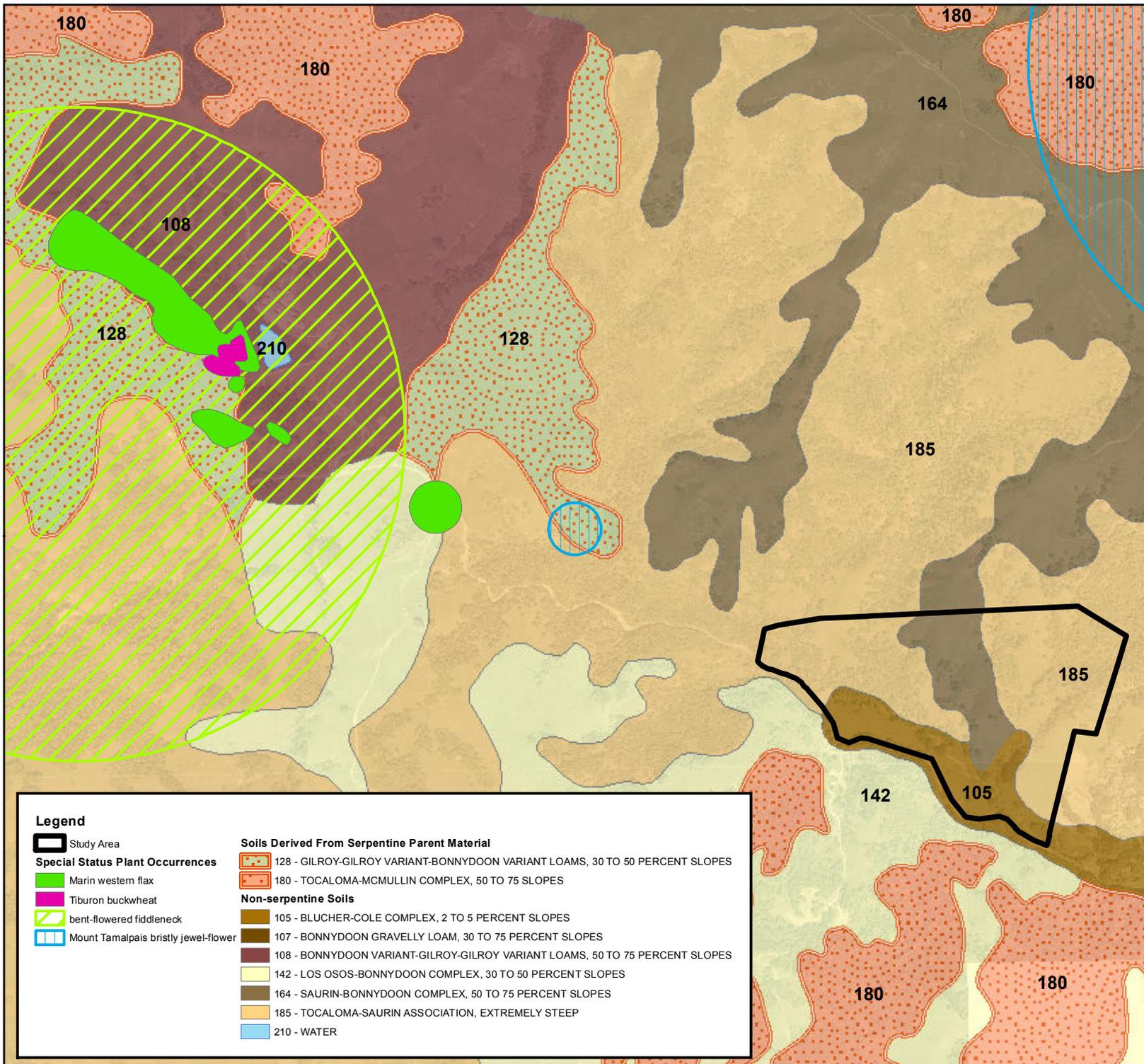
Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*). **Federal Endangered. CNPS List 1B.** This species is a perennial grass in the grass family (Poaceae) that occurs with other wetland species in freshwater marshes, riparian banks, and wet areas. It is known from 5 to 365 meters in elevation in Marin and Sonoma counties and is in flower from May to July. Riparian and freshwater marsh communities in the Study Area could provide suitable habitat for this species. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Napa false indigo (*Amorpha californica* var. *napensis*). **CNPS List 1B.** Napa false indigo is a deciduous shrub in the pea family (Fabaceae) that blooms from April to July. It occurs in broadleaf upland forest, chaparral, and cismontane woodland, often in openings. It is known from 120 to 2000 meters in Monterey, Marin, Napa, and Sonoma counties. Oak-bay woodland and riparian communities in the Study Area could provide suitable habitat for this species. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Grady Ranch
Marin County, California

Figure 3

Soils Map and Special Status Plant Occurrences



Legend

 Study Area

Special Status Plant Occurrences

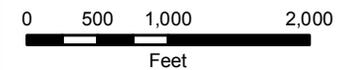
-  Marin western flax
-  Tiburon buckwheat
-  bent-flowered fiddleneck
-  Mount Tamalpais bristly jewel-flower

Soils Derived From Serpentine Parent Material

-  128 - GILROY-GILROY VARIANT-BONNYDOON VARIANT LOAMS, 30 TO 50 PERCENT SLOPES
-  180 - TOCALOMA-MCMULLIN COMPLEX, 50 TO 75 SLOPES

Non-serpentine Soils

-  105 - BLUCHER-COLE COMPLEX, 2 TO 5 PERCENT SLOPES
-  107 - BONNYDOON GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES
-  108 - BONNYDOON VARIANT-GILROY-GILROY VARIANT LOAMS, 50 TO 75 PERCENT SLOPES
-  142 - LOS OSOS-BONNYDOON COMPLEX, 30 TO 50 PERCENT SLOPES
-  164 - SAURIN-BONNYDOON COMPLEX, 50 TO 75 PERCENT SLOPES
-  185 - TOCALOMA-SAURIN ASSOCIATION, EXTREMELY STEEP
-  210 - WATER



Bent-flowered fiddleneck (*Amsinckia lunaris*). CNPS List 1B. Bent-flowered fiddleneck is a California endemic annual herb in the forget-me-not family (Boraginaceae) that typically inhabits coastal bluff scrub, cismontane woodlands, and valley and foothill grasslands. It is known from Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo and Yolo counties. This species is typically found from 3 to 500 meters with a blooming period of March to June. Because the Study Area has grassland habitat, the species has a moderate potential to occur within the Study Area. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Western leatherwood (*Dirca occidentalis*). CNPS List 1B. Western leatherwood is a deciduous shrub in the Thymelaeaceae that typically occurs in mesic sites in broadleaf upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland. This species is usually found from 50 to 395 meters and is known from Alameda, Contra Costa, Marin, Santa Clara, San Mateo, and Sonoma counties. It has a blooming period of January to March. Because the Study Area has riparian and woodland habitats, this species has a moderate potential to occur within the Study Area. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Koch's cord moss (*Entosthodon kochii*). CNPS List 1B. Koch's cord moss is a moss in the Funariaceae that occurs on soil in cismontane woodlands from 180 to 1000 meters. It is known from Mendocino, Mariposa, Marin, and San Luis Obispo counties. Suitable habitat for this species is present in the Study Area's oak-bay woodland and the species has been recorded along Lucas Valley Road. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Streamside daisy (*Erigeron biolettii*). CNPS List 3. Streamside daisy is an annual herb in the sunflower family (Asteraceae) that blooms from June to October. It is found from 30 to 1100 meters in mesic sites on dry slopes, rocks, and ledges along rivers. It is known from broadleaf upland forest, cismontane woodland, and North Coast coniferous forest habitats in Humboldt, Mendocino, Marin, Napa, Solano, and Sonoma counties. Suitable habitat for this species may be found along Study Area creeks. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Diablo helianthella (*Helianthella castanea*). CNPS List 1B. Diablo helianthella is a perennial herb in the sunflower family (Asteraceae) that blooms from March to June. It is found in a variety of plant communities: broadleaf upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. It is known from 60 to 1300 meters in elevation in Alameda, Contra Costa, Marin, Santa Clara, San Mateo, and San Francisco counties. It tends to occur in rocky, azonal soils and partial shade at interfaces between chaparral, woodland, and grassland communities. Grassland and woodland communities in the Study Area may contain suitable habitat for this species. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Hayfield tarweed (*Hemizonia congesta* ssp. *leucocephala*). CNPS List 3. Hayfield tarweed is an annual herb in the sunflower family (Asteraceae) that blooms from April to October. It occurs in coastal scrub and in hills and valleys in valley and foothill grassland and is found at elevations from 25 to 455 meters. It is sometimes found on roadsides or in fallow fields. Hayfield tarweed is known from Marin, Sonoma, and Mendocino counties. Grassland in the Study Area may provide

suitable habitat for this species. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Mt. Diablo cottonweed (*Micropus amphibolus*). CNPS List 3. Mt. Diablo cottonweed is an annual herb in the sunflower family (Asteraceae) that blooms from March to May. It occurs on bare, grassy, or rocky slopes in broadleaf upland forest, chaparral, cismontane woodland, and valley and foothill grassland. It has been recorded in Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, Solano, and Sonoma counties at elevations from 45-825 meters. Suitable habitat in the Study Area may be found in grasslands and woodlands. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Marsh microseris (*Microseris paludosa*). CNPS List 3. Marsh microseris is a perennial herb in the sunflower family (Asteraceae) that blooms from April to June. It occurs in closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland, often where grasses are low-growing. It is known from 5 to 300 meters in Mendocino, Monterey, Marin, San Benito, Santa Cruz, San Francisco, San Luis Obispo, San Mateo, and Sonoma counties. Suitable habitat for this species may occur in Study Area native or non-native grasslands. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

Two-fork clover (*Trifolium amoenum*). Federal Endangered, CNPS List 1B. Two-fork clover is an annual herb in the pea family (Fabaceae) that typically inhabits valley and foothill grassland and coastal bluff scrub, sometimes occurring on serpentinite, roadsides, swales, or cliff faces. The species is known from 5 to 560 meters in elevation in Alameda, Marin, Napa, Santa Clara, Solano, and Sonoma counties and blooms from April to June. Grassland communities in the Study Area may provide suitable habitat for this species. This species was not observed during protocol level surveys conducted during the species' peak blooming period.

3.2 Field Survey Results

No special status plant species were observed within the Study Area. All species observed within the Study Area are listed in Appendix A.

Approximately 100 individuals of Tiburon buckwheat were observed adjacent to the Study Area within the larger Grady Ranch Property. This population was located approximately 200 feet north of the Study Area boundary, on a south- to west-facing slope in annual grassland. Soils in this location were thin and are likely derived from an inclusion of serpentinite parent material. Overall cover of herbaceous species was lower than surrounding non-native annual grasslands, with a higher native component. Soil and vegetation in this area are unique from habitats found within the Study Area.

Two special status species observed by LSA in 1992, Tiburon buckwheat and Mt. Tamalpais jewelflower, were not observed in the Study Area. These species were historically observed in the larger Grady Ranch property, outside of the Study Area considered by this survey. Portions of the larger Grady Ranch property to the north and west of the current Study Area contain serpentine outcrops and areas of thin, serpentinite-derived soils that could support these species, however, no serpentine habitat is located within the Study Area considered by this survey.

4.0 CONCLUSION

No special status plant species were observed during focused botanical surveys on the Grady Ranch Study Area. While several special status species are known from serpentine habitats to the west of the Study Area, serpentine rock outcrops and serpentinite-derived soils were not observed within the Study Area. Soils in the Study Area are derived from sandstone and/or shale parent material, or from alluvium derived from mixed sources. Therefore serpentine-dependent special status species are not expected to occur in the Study Area. A population of approximately 100 Tiburon buckwheat individuals (CNPS List 1B) was observed within the larger Grady Ranch Property, however this population was located outside of the Study Area boundary.

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Appendix A. List of Species Observed in the Study Area

Section	Family	Scientific Name	Common Name	Status*
<i>Ferns</i>				
	Blechnaceae	<i>Woodwardia fimbriata</i>	giant chainfern	n
	Dryopteridaceae	<i>Dryopteris arguta</i>	wood fern	n
	Dryopteridaceae	<i>Polystichum californicum</i>	shield fern	n
	Dryopteridaceae	<i>Polystichum munitum</i>	sword fern	n
	Equisetaceae	<i>Equisetum arvense</i>	common horsetail	n
	Polypodiaceae	<i>Polypodium californicum</i>	California polypody	n
	Pteridaceae	<i>Adiantum jordanii</i>	maidenhair fern	n
	Pteridaceae	<i>Pelleae andromedifolia</i>	coffee fern	n
	Pteridaceae	<i>Pentagramma triangularis</i>	goldenback fern	n
<i>Gymnosperms</i>				
	Cupressaceae	<i>Sequoia sempervirens</i>	coast redwood	n
	Pinaceae	<i>Pinus radiata</i>	monterey pine (plantation)	nn
	Pinaceae	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas-fir	n
<i>Magnoliids</i>				
	Lauraceae	<i>Umbellularia californica</i>	bay laurel	n
<i>Eudicots</i>				
	Aceraceae	<i>Acer macrophyllum</i>	big-leaf maple	n
	Anacardiaceae	<i>Toxicodendron diversilobum</i>	poison oak	n
	Apiaceae	<i>Anthriscus caucalis</i>	bur chervil	nn
	Apiaceae	<i>Conium maculatum</i>	poison-hemlock	Cal-IPC Moderate
	Apiaceae	<i>Daucus pusillus</i>	wild carrot	n
	Apiaceae	<i>Foeniculum vulgare</i>	sweet fennel	Cal-IPC High
	Apiaceae	<i>Lomatium dasycarpum</i> ssp. <i>dasycarpum</i>	hog fennel	n
	Apiaceae	<i>Osmorhiza berteroi</i>	sweet cicely	n
	Apiaceae	<i>Perideridia</i> sp.	yampah	n
	Apiaceae	<i>Sanicula bipinnatifida</i>	purple sanicle	n
	Apiaceae	<i>Sanicula crassicaulis</i>	pacific sanicle	n
	Apiaceae	<i>Sanicula tuberosa</i>	tuberous sanicle	n
	Apiaceae	<i>Scandix pecten-veneris</i>	shepherd's needle	nn
	Apiaceae	<i>Torilis arvensis</i>	field hedge-parsley	Cal-IPC Moderate
	Apocynaceae	<i>Nerium oleander</i>	oleander	nn
	Asteraceae	<i>Achillea millefolium</i>	yarrow	n
	Asteraceae	<i>Agoseris grandiflora</i>	California dandelion	n
	Asteraceae	<i>Artemisia californica</i>	coast sagebrush	n
	Asteraceae	<i>Artemisia douglasiana</i>	mugwort	n
	Asteraceae	<i>Baccharis pilularis</i>	coyotebrush	n
	Asteraceae	<i>Carduus pycnocephalus</i>	Italian thistle	Cal-IPC Moderate
	Asteraceae	<i>Centaurea calcitrapa</i>	purple starthistle	Cal-IPC Moderate
	Asteraceae	<i>Centaurea melitensis</i>	toçalote thistle	Cal-IPC Moderate
	Asteraceae	<i>Centaurea solstitialis</i>	yellow starthistle	Cal-IPC High
	Asteraceae	<i>Cirsium vulgare</i>	bull thistle	Cal-IPC Moderate
	Asteraceae	<i>Conyza canadensis</i>	asthmaweed	n
	Asteraceae	<i>Cotula coronopifolia</i>	brass buttons	Cal-IPC Limited
	Asteraceae	<i>Filago gallica</i>	filago	nn
	Asteraceae	<i>Gnaphalium californicum</i>	California cudweed	n
	Asteraceae	<i>Gnaphalium luteo-album</i>	everlasting cudweed	nn
	Asteraceae	<i>Helenium puberulum</i>	rosilla	n
	Asteraceae	<i>Hemizonia congesta</i> ssp. <i>congesta</i>	hayfield tarweed	n
	Asteraceae	<i>Hypochaeris radicata</i>	rough cat's ear	Cal-IPC Moderate
	Asteraceae	<i>Lactuca serriola</i>	prickly lettuce	nn
	Asteraceae	<i>Leontodon saxatilis</i> ssp. <i>longirostris</i>	hairy hawkbit	nn
	Asteraceae	<i>Madia gracilis</i>	slender tarweed	n
	Asteraceae	<i>Senecio vulgaris</i>	old man of the spring	nn
	Asteraceae	<i>Silybum marianum</i>	milk thistle	Cal-IPC Limited
	Asteraceae	<i>Soliva sessilis</i>	common soliva	nn
	Asteraceae	<i>Sonchus asper</i>	prickly sowthistle	nn
	Asteraceae	<i>Tragopogon porrifolius</i>	purple salsify	nn
	Asteraceae	<i>Uropappus lindleyi</i>	silver puffs	n
	Asteraceae	<i>Wyethia angustifolia</i>	narrow-leaf mule's ear	n
	Asteraceae	<i>Xanthium spinosum</i>	spiny cocklebur	n
	Boraginaceae	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	common fiddleneck	n
	Boraginaceae	<i>Cynoglossum grande</i>	hound's tongue	n
	Boraginaceae	<i>Nemophila menziesii</i>	baby blue eyes	n
	Boraginaceae	<i>Phacelia imbricata</i> ssp. <i>imbricata</i>	imbricate phacelia	n
	Boraginaceae	<i>Plagiobothrys</i> sp.	popcorn flower	n

Brassicaceae	<i>Brassica nigra</i>	black mustard	Cal-IPC Moderate
Brassicaceae	<i>Cardamine californica</i>	milk maids	n
Brassicaceae	<i>Rorippa nasturtium-aquaticum</i>	watercress	n
Brassicaceae	<i>Thysanocarpus laciniatus</i>	cut leaf fringe pod	n
Caprifoliaceae	<i>Lonicera hispidula</i>	pink honeysuckle	n
Caprifoliaceae	<i>Sambucus mexicana</i>	blue elderberry	n
Caprifoliaceae	<i>Symphoricarpos mollis</i>	creeping snowberry	n
Caryophyllaceae	<i>Cerastium glomeratum</i>	sticky chickweed	nn
Caryophyllaceae	<i>Silene gallica</i>	small-flower catchfly	nn
Convolvulaceae	<i>Calystegia purpurata</i> ssp. <i>purpurata</i>	purple western morning glory	n
Convolvulaceae	<i>Convolvulus arvensis</i>	field bindweed	nn
Crassulaceae	<i>Dudleya cymosa</i>	canyon dudleya	n
Cucurbitaceae	<i>Marah fabaceus</i>	California manroot	n
Ericaceae	<i>Arbutus menziesii</i>	pacific madrone	n
Euphorbiaceae	<i>Eremocarpus setigerus</i>	turkey mullein	n
Euphorbiaceae	<i>Euphorbia oblongata</i>	eggleaf spurge	Cal-IPC Limited
Fabaceae	<i>Astragalus gambelianus</i>	Gambel's dwarf milk-vetch	n
Fabaceae	<i>Lathyrus vestitus</i> var. <i>vestitus</i>	common Pacific pea	n
Fabaceae	<i>Lotus scoparius</i>	deerweed	n
Fabaceae	<i>Lotus strigosus</i>	strigose lotus	n
Fabaceae	<i>Lotus wrangelianus</i>	Chilean lotus	n
Fabaceae	<i>Lupinus bicolor</i>	miniature lupine	n
Fabaceae	<i>Medicago polymorpha</i>	California bur clover	Cal-IPC Limited
Fabaceae	<i>Trifolium bifidum</i> var. <i>bifidum</i>	Pinole clover	n
Fabaceae	<i>Trifolium dubium</i>	shamrock clover	nn
Fabaceae	<i>Trifolium hirtum</i>	rose clover	Cal-IPC Moderate
Fabaceae	<i>Trifolium willdenovii</i>	tomcat clover	n
Fabaceae	<i>Vicia sativa</i>	spring vetch	nn
Fagaceae	<i>Quercus agrifolia</i>	coast live-oak	n
Fagaceae	<i>Quercus garryana</i>	Oregon white oak	n
Fagaceae	<i>Quercus lobata</i>	Valley oak	n
Gentianaceae	<i>Centaurium muehlenbergii</i>	Monterey centaury	n
Geraniaceae	<i>Erodium botrys</i>	broadleaf filaree	nn
Geraniaceae	<i>Erodium cicutarium</i>	redstem stork's bill	Cal-IPC Limited
Geraniaceae	<i>Geranium dissectum</i>	cut-leaf geranium	Cal-IPC Moderate
Geraniaceae	<i>Geranium molle</i>	dovefoot geranium	nn
Grossulariaceae	<i>Ribes californicum</i>	California gooseberry	n
Hippocastanaceae	<i>Aesculus californica</i>	California buckeye	n
Lamiaceae	<i>Mentha pulegium</i>	pennyroyal	Cal-IPC Moderate
Lamiaceae	<i>Stachys ajugoides</i>	hedge nettle	n
Montiaceae	<i>Claytonia parviflora</i>	Miner's lettuce	n
Onagraceae	<i>Camissonia ovata</i>	sun cups	n
Onagraceae	<i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>	winecup clarkia	n
Onagraceae	<i>Epilobium brachycarpum</i>	willow-herb	n
Onagraceae	<i>Epilobium canum</i>	California fuchsia	n
Papaveraceae	<i>Eschscholzia californica</i>	California poppy	n
Polemoniaceae	<i>Gilia clivorum</i>	purplespot gilia	n
Polemoniaceae	<i>Linanthus androsaceus</i>	false babystars	n
Polemoniaceae	<i>Phlox gracilis</i>	slender phlox	n
Polygalaceae	<i>Polygala californica</i>	California milkwort	n
Polygonaceae	<i>Eriogonum nudum</i>	nude buckwheat	n
Polygonaceae	<i>Rumex acetosella</i>	sheep sorrel	Cal-IPC Moderate
Polygonaceae	<i>Rumex crispus</i>	curly dock	Cal-IPC Limited
Polygonaceae	<i>Rumex pulcher</i>	fiddle dock	nn
Primulaceae	<i>Anagallis arvensis</i>	scarlet pimpernel	nn
Primulaceae	<i>Dodecatheon hendersonii</i>	shooting star	n
Primulaceae	<i>Trientalis latifolia</i>	starflower	n
Ranunculaceae	<i>Delphinium nudicaule</i>	red larkspur	n
Ranunculaceae	<i>Ranunculus californicus</i>	California buttercup	n
Ranunculaceae	<i>Thalictrum fendleri</i>	meadow rue	n
Rosaceae	<i>Aphanes occidentalis</i>	lady's mantle	n
Rosaceae	<i>Fragaria vesca</i>	wood strawberry	n
Rosaceae	<i>Holodiscus discolor</i>	oceanspray	n
Rosaceae	<i>Prunus cerasifera</i>	cherry plum (cultivar)	Cal-IPC Limited
Rosaceae	<i>Pyracantha angustifolia</i>	firethorn	Cal-IPC Limited
Rosaceae	<i>Rosa californica</i>	California rose	n
Rosaceae	<i>Rubus discolor</i>	Himalayan blackberry	Cal-IPC High
Rosaceae	<i>Rubus leucodermis</i>	western raspberry	n
Rosaceae	<i>Rubus ursinus</i>	California blackberry	n
Rubiaceae	<i>Galium aparine</i>	cleavers	n
Rubiaceae	<i>Galium porrigens</i>	climbing bedstraw	n
Rubiaceae	<i>Sherardia arvensis</i>	field madder	nn
Salicaceae	<i>Salix lasiolepis</i>	arroyo willow	n
Saxifragaceae	<i>Lithophragma affine</i>	woodland star	n

Scrophulariaceae	<i>Collinsia heterophylla</i> var. <i>heterophylla</i>	Chinese houses	n
Scrophulariaceae	<i>Mimulus aurantiacus</i>	bush monkeyflower	n
Scrophulariaceae	<i>Mimulus cardinalis</i>	scarlet monkeyflower	n
Scrophulariaceae	<i>Mimulus guttatus</i>	seep monkeyflower	n
Scrophulariaceae	<i>Plantago erecta</i>	dwarf plantain	n
Scrophulariaceae	<i>Plantago lanceolata</i>	English plantain	Cal-IPC Limited
Scrophulariaceae	<i>Scrophularia californica</i>	beeplant	n
Solanaceae	<i>Solanum nigrum</i>	black nightshade	n
Urticaceae	<i>Urtica dioica</i>	stinging nettle	n

Monocots

Cyperaceae	<i>Carex nebrascensis</i>	Nebraska sedge	n
Cyperaceae	<i>Carex praegracilis</i>	field sedge	n
Cyperaceae	<i>Carex subbracteata</i>	small bract sedge	n
Cyperaceae	<i>Cyperus eragrostis</i>	tall flatsedge	n
Iridaceae	<i>Iris macrosiphon</i>	ground iris	n
Iridaceae	<i>Romulea rosea</i>	rosy sandcrocus	nn
Iridaceae	<i>Sisyrinchium bellum</i>	blue-eyed grass	n
Juncaceae	<i>Juncus effusus</i>	soft rush	n
Juncaceae	<i>Juncus patens</i>	spreading rush	n
Juncaceae	<i>Juncus phaeocephalus</i>	brown-head rush	n
Juncaceae	<i>Juncus xiphioides</i>	iris-leaf rush	n
Juncaceae	<i>Luzula comosa</i>	wood rush	n
Liliaceae	<i>Amaryllis belladonna</i>	naked ladies	nn
Liliaceae	<i>Brodiaea elegans</i> ssp. <i>elegans</i>	harvest brodiaea	n
Liliaceae	<i>Calochortus luteus</i>	yellow mariposa lily	n
Liliaceae	<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	soap plant	n
Liliaceae	<i>Dichelostemma capitatum</i>	blue dicks	n
Liliaceae	<i>Dichelostemma congestum</i>	ookow	n
Liliaceae	<i>Fritillaria affinis</i> var. <i>affinis</i>	checker lily	n
Liliaceae	<i>Triteleia hyacinthina</i>	wild hyacinth	n
Liliaceae	<i>Triteleia laxa</i>	Ithuriel's spear	n
Liliaceae	<i>Zigadenus fremontii</i>	death camas	n
Poaceae	<i>Aira caryophylla</i>	silver hairgrass	nn
Poaceae	<i>Avena barbata</i>	slender wild oats	Cal-IPC Moderate
Poaceae	<i>Avena fatua</i>	wild oats	Cal-IPC Moderate
Poaceae	<i>Brachypodium distachyon</i>	false brome	Cal-IPC Moderate
Poaceae	<i>Briza maxima</i>	rattlesnake grass	Cal-IPC Limited
Poaceae	<i>Briza minor</i>	little quaking grass	nn
Poaceae	<i>Bromus carinatus</i>	California brome	n
Poaceae	<i>Bromus diandrus</i>	rip-gut brome	Cal-IPC Moderate
Poaceae	<i>Bromus grandis</i>	tall brome	n
Poaceae	<i>Bromus hordeaceus</i>	soft chess	Cal-IPC Limited
Poaceae	<i>Cynodon dactylon</i>	bermuda grass	Cal-IPC Moderate
Poaceae	<i>Cynosurus echinatus</i>	hedgehog dogtail	Cal-IPC Moderate
Poaceae	<i>Danthonia californica</i>	California oatgrass	n
Poaceae	<i>Elymus elymoides</i>	squirreltail	n
Poaceae	<i>Elymus glaucus</i>	blue wild-rye	n
Poaceae	<i>Festuca occidentalis</i>	western fescue	n
Poaceae	<i>Gastridium ventricosum</i>	nit grass	nn
Poaceae	<i>Holcus lanatus</i>	velvet grass	Cal-IPC Moderate
Poaceae	<i>Hordeum marinum</i>	Mediterranean barley	Cal-IPC Moderate
Poaceae	<i>Hordeum murinum</i>	foxtail barley	Cal-IPC Moderate
Poaceae	<i>Leymus triticoides</i>	beardless wild-rye	n
Poaceae	<i>Lolium multiflorum</i>	Italian ryegrass	Cal-IPC Moderate
Poaceae	<i>Melica torreyana</i>	Torrey melic	n
Poaceae	<i>Nassella pulchra</i>	purple needlegrass	n
Poaceae	<i>Phalaris aquatica</i>	Harding grass	Cal-IPC Moderate
Poaceae	<i>Polypogon monspeliensis</i>	rabbitsfoot grass	Cal-IPC Limited
Poaceae	<i>Vulpia myuros</i>	foxtail fescue	Cal-IPC Moderate

*Key to Status Codes

Cal-IPC Limited	California Invasive Plant Council Weed of Limited Invasiveness (Cal-IPC 2006)
Cal-IPC Moderate	California Invasive Plant Council Weed of Moderate Invasiveness (Cal-IPC 2006)
Cal-IPC High	California Invasive Plant Council Weed of High Invasiveness (Cal-IPC 2006)
n	native plant
nn	non-native plant

Appendix B. Special Status Plant and Wildlife Species Habitat Suitability in the Grady Ranch Study Area. List compiled from 2011 searches of the California Department of Fish and Game (CDFG) Natural Diversity Database, U.S. Fish and Wildlife Service (USFWS) Species Lists, and California Native Plant Society (CNPS) Electronic Inventory for the Novato, San Rafael, Bolinas, Sears Point, Petaluma Point, San Quentin, Petaluma River, Petaluma, and San Geronimo USGS 7.5' quadrangles.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Franciscan onion <i>Allium peninsulare</i> var. <i>franciscanum</i>	List 1B (May-June)	Cismontane woodland, valley and foothill grassland. Clay, volcanic, often serpentinite substrates. 52-300 meters	Unlikely. Suitable substrates are not present in Study Area.	No further actions are recommended.
Sonoma alopecurus <i>Alopecurus aequalis</i> var. <i>sonomensis</i>	FE; List 1B (May-July)	Freshwater marshes and swamps, riparian scrub, wet streambanks. 5-365 meters	Moderate. Suitable habitat exists in Study Area.	Species not found during May protocol level survey. No further action is recommended.
Napa false indigo <i>Amorpha californica</i> var. <i>napensis</i>	List 1B (April-July)	Chaparral; openings in broadleaf upland forest or cismontane woodland. 120-2000 meters	Moderate. Suitable habitat exists in Study Area.	Species not found during May protocol level survey. No further action is recommended.
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	List 1B (March-June)	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. 3-500 meters.	Moderate. The Study Area contains suitable habitat.	Species not found during May protocol level survey. No further action is recommended.
Mt. Tamalpais manzanita <i>Arctostaphylos hookeri</i> ssp. <i>montana</i>	List 1B (February-April)	Serpentinite, rocky sites in chaparral, valley and foothill grassland. 160-760 meters.	No potential. The Study Area lacks serpentine substrate. No manzanita is present in Study Area.	No further actions are recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Marin manzanita <i>Arctostaphylos virgata</i>	List 1B (January- March)	On sandstone or granitic substrate in broadleaf upland forest, closed-cone coniferous forest, chaparral, North Coast coniferous forest. 60-700 meters.	No potential. No manzanita is present in Study Area.	No further actions are recommended.
marsh milk-vetch <i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i>	List 1B (April- October)	Coastal dunes, coastal scrub, coastal salt marshes, streamsides. 0-30 meters.	No potential. The species is limited to various coastal sites which are not present in the Study Area.	No further actions are recommended.
coastal marsh milk-vetch <i>Astragalus tener</i> var. <i>tener</i>	List 1B (March- June)	Alkaline substrate in playas, vernal pools, adobe clay sites in valley and foothill grassland. 1-60 meters.	No potential. Suitable habitat is not present in the Study Area.	No further actions are recommended.
Sonoma sunshine <i>Blennosperma bakeri</i>	FE; SE; List 1B (March- May)	Mesic sites in valley and foothill grassland, vernal pools. 10-100 meters.	No potential. Suitable habitat is not present in the Study Area.	No further actions are recommended.
small groundcone <i>Boschniakia hookeri</i>	List 2 (April- August)	North Coast coniferous forest. 90-885 meters.	No potential. The species is limited to coniferous forests which are not present in the Study Area.	No further actions are recommended.
round-leaved filaree <i>California macrophylla</i>	List 1B (March- May)	Clay soils in cismontane woodland, valley and foothill grassland. 15-1200 meters.	Unlikely. The Study Area lacks clay soils, though there may be limited clay inclusions.	No further actions are recommended.
Tiburon mariposa lily <i>Calochortus tiburonensis</i>	FT; ST; List 1B (March- June)	Serpentinite in valley and foothill grassland. 50-150 meters.	No potential. The Study Area lacks serpentine substrate.	No further actions are recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Lyngbye's sedge <i>Carex lyngbyei</i>	List 2 (May- August)	Brackish or freshwater marshes and swamps. 0-10 meters.	No potential. Study Area lacks low-elevation marsh habitat.	No further actions are recommended.
Tiburon paintbrush <i>Castilleja affinis</i> ssp. <i>neglecta</i>	FE; ST; List 1B (April-June)	Serpentinite in valley and foothill grassland. 60-400 meters.	No potential. The Study Area lacks serpentine substrate.	No further actions are recommended.
Mason's ceanothus <i>Ceanothus masonii</i>	SR; List 1B (March- April)	Rocky, serpentinite sites in chaparral. 430-500 meters.	No potential. The Study Area lacks serpentine substrate.	No further actions are recommended.
pappose tarplant <i>Centromadia parryi</i> ssp. <i>parryi</i>	List 1B (May- November)	Chaparral, coastal prairie, meadows and seeps, coastal salt marshes, vernal mesic valley and foothill grassland. Often in alkaline sites. 2-420 meters.	Unlikely. The Study Area does not contain alkaline substrate.	No further actions are recommended.
San Francisco Bay spineflower <i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>	List 1B (April-July)	Sandy soils in coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. 3-215 meters.	No potential. The species is limited to various coastal sites which are not present in the Study Area.	No further actions are recommended.
Sonoma spineflower <i>Chorizanthe valida</i>	FE; SE; List 1B (June- August)	Coastal prairie. 10-305 meters.	No potential. The species is limited to coastal prairie which is not present in the Study Area.	No further actions are recommended.
Mt. Tamalpais thistle <i>Cirsium hydrophyllum</i> var. <i>vaseyi</i>	List 1B (May- August)	Serpentinite seeps in broadleaf upland forest, chaparral, meadows. 240-620 meters.	No potential. The Study Area lacks serpentine substrate.	No further actions are recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
roundhead Chinese houses <i>Collinsia corymbosa</i>	List 1B (April-June)	Coastal dunes. 0-20 meters.	No potential. The species is limited to coastal dunes which are not present in the Study Area.	No further actions are recommended.
Point Reyes bird's-beak <i>Cordylanthus maritimus</i> <i>ssp. palustris</i>	List 1B (June- October)	Coastal salt marshes. 0-10 meters.	No potential. The species is limited to coastal marshes which are not present in the Study Area.	No further actions are recommended.
soft bird's-beak <i>Cordylanthus mollis</i> <i>ssp. mollis</i>	FE; SR; List 1B (July- November)	Coastal salt marshes. 0-3 meters.	No potential. The species is limited to coastal marshes which are not present in the Study Area.	No further actions are recommended.
Baker's delphinium <i>Delphinium bakeri</i>	FE; SR; List 1B (March- May)	Broadleaf upland forest, coastal scrub, valley and foothill grassland. On decomposed shale and often in mesic sites. 80-305 meters.	Unlikely. Suitable habitat limited to nonexistent in Study Area. Species known from only one extant occurrence.	No further actions are recommended.
yellow larkspur <i>Delphinium luteum</i>	FE; SR; List 1B (March- May)	Rocky sites in chaparral, coastal prairie, coastal scrub. 0-100 meters.	No potential. The Study Area lacks suitable habitat for this species.	No further actions are recommended.
western leatherwood <i>Dirca occidentalis</i>	List 1B (January- March)	Mesic sites in broadleaf upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, riparian woodland. 50-395 meters.	Moderate. The Study Area contains suitable habitat for this species.	Species not found during March protocol level survey. No further action is recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
dwarf downingia <i>Downingia pusilla</i>	List 2 (March- May)	Mesic valley and foothill grassland, vernal pools. 1-445 meters.	No potential. Suitable habitat is not present in Study Area.	No further actions are recommended.
Koch's cord moss <i>Entosthodon kochii</i>	List 1B	Soil in cismontane woodland. 180-1000 meters.	Moderate. Suitable habitat is present in the Study Area. Species has been recorded along Lucas Valley Road.	Species not found during May protocol level survey. No further action is recommended.
streamside daisy <i>Erigeron biolettii</i>	List 3 (June- October)	Dry slopes, rocks, ledges along rivers; mesic sites. In broadleaf upland forest, cismontane woodland, North Coast coniferous forest. 30-1100 meters.	Moderate. Suitable habitat may be present along streams in Study Area.	Species not observed during site visits. No further surveys are recommended.
Tiburon buckwheat <i>Eriogonum luteolum</i> var. <i>caninum</i>	List 1B (May- September)	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. On serpentine soils, sandy to gravelly sites. 0-700 meters.	No potential. The Study Area lacks serpentine substrate.	No further actions are recommended.
minute pocket moss <i>Fissidens pauperculus</i>	List 1B	Damp to coastal soil in North Coast coniferous forest. 10-1024 meters.	No potential. This species is limited to damp coastal forests which are not present in the Study Area.	No further actions are recommended.
Marin checker lily <i>Fritillaria lanceolata</i> var. <i>tristulis</i>	List 1B (February- May)	Coastal bluff scrub, coastal prairie, coastal scrub. 15-150 meters.	No potential. This species is limited to various coastal sites which are not present in the Study Area.	No further actions are recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
fragrant fritillary <i>Fritillaria liliacea</i>	List 1B (February- April)	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland; often on serpentinite or clay soil. 3-410 meters.	Low. Suitable habitat is present in Study Area, but serpentine or clay soils are not present.	No further actions are recommended.
dune gilia <i>Gilia capitata</i> ssp. <i>chamissonis</i>	List 1B (April-July)	Coastal dunes, coastal scrub. 2-200 meters.	No potential. This species is limited to coastal habitats which are not present in the Study Area.	No further actions are recommended.
woolly-headed gilia <i>Gilia capitata</i> ssp. <i>tomentosa</i>	List 1B (May-July)	Rocky outcrops in coastal bluff scrub. 15-155 meters.	No potential. This species is limited to coastal scrub which is not present in the Study Area.	No further actions are recommended.
San Francisco gumplant <i>Grindelia hirsutula</i> var. <i>maritima</i>	List 1B (June- September)	Sandy or serpentinite sites in coastal bluff scrub, coastal scrub, valley and foothill grassland. 15-400 meters.	No potential. Suitable substrate is not present in Study Area.	No further actions are recommended.
Diablo helianthella <i>Helianthella castanea</i>	List 1B (March- June)	Broadleaf upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. 60-1300 meters.	Moderate. Suitable habitats are present in the Study Area.	Species not found during May protocol level survey. No further action is recommended.
hayfield tarweed <i>Hemizonia congesta</i> ssp. <i>leucocephala</i>	List 3 (April- October)	Coastal scrub, hills and valleys in valley and foothill grassland. Sometimes on roadsides or in fallow fields. 25-455 meters.	Moderate. Suitable grassland habitat is present in the Study Area.	Species not found during May protocol level survey. No further action is recommended.
Marin western flax <i>Hesperolinon congestum</i>	FT; ST; List 1B (April-July)	Serpentine sites in chaparral, valley and foothill grassland; sometimes on roadsides. 5-370 meters.	No potential. The Study Area lacks serpentine substrate.	No further actions are recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Santa Cruz tarplant <i>Holocarpha macradenia</i>	FT; FE; List 1B (June- October)	Serpentinite in chaparral or valley and foothill grassland. 10-220 meters.	No potential. The Study Area lacks serpentine substrate.	No further actions are recommended.
thin-lobed horkelia <i>Horkelia tenuiloba</i>	List 1B (May-July)	Mesic, sandy openings in broadleaf upland forest, chaparral, valley and foothill grassland. 50-500 meters.	No potential. The Study Area lacks suitable habitat for this species.	No further actions are recommended.
Contra Costa goldfields <i>Lasthenia conjugens</i>	FE; List 1B (March- June)	Mesic sites in cismontane woodland, alkaline playas, valley and foothill grassland, vernal pools. 0-470 meters.	No potential. The Study Area lacks suitable mesic habitat for this species.	No further actions are recommended.
coast yellow leptosiphon <i>Leptosiphon croceus</i>	List 1B (April-May)	Coastal bluff scrub, coastal prairie. 10-150 meters.	No potential. This species is limited to coastal sites which are not present in the Study Area.	No further actions are recommended.
woolly headed lessingia <i>Lessingia hololeuca</i>	List 3 (June- October)	Clay or serpentinite in broadleaf upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland. 15- 305 meters.	No potential. Suitable substrate is not present in Study Area.	No further actions are recommended.
Tamalpais lessingia <i>Lessingia micradenia</i> var. <i>micradenia</i>	List 1B (July- October)	Chaparral, valley and foothill grassland; usually on serpentinite and often on roadsides. 100-500 meters.	Unlikely. Serpentine substrate is not present in Study Area.	No further actions are recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Mt. Diablo cottonweed <i>Micropus amphibolus</i>	List 3 (March- May)	Bare, grassy, or rocky slopes in broadleaf upland forest, chaparral, cismontane woodland, valley and foothill grassland. 45-825 meters.	Moderate. Suitable habitat is present in Study Area.	Species not found during May protocol level survey. No further action is recommended.
marsh microseris <i>Microseris paludosa</i>	List 1B (April-June)	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. 5-300 meters.	Moderate. Suitable habitat is present in Study Area, but species mostly limited to historic occurrences.	Species not found during May protocol level survey. No further action is recommended.
elongate copper moss <i>Mielichhoferia elongata</i>	List 2	Metamorphic, rock, usually vernal mesic sites in cismontane woodland. 500-1300 meters.	No potential. Suitable habitat is not present in Study Area, which is well below the elevation range of the species.	No further actions are recommended.
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	List 1B (April-July)	Mesic sites in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Adobe or alkaline soils. 5-1740 meters.	No potential. Suitable habitat and substrate not present in Study Area.	No further actions are recommended.
Marin County navarretia <i>Navarretia rosulata</i>	List 1B (May-July)	Serpentinite, rocky sites in closed-cone coniferous forest, chaparral. 200-635 meters.	No potential. Study Area lacks serpentine substrate.	No further actions are recommended.
white-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	FE; SE; List 1B (March- May)	Cismontane woodland, valley and foothill grassland. Open, dry rocky slopes and grassy areas, often on serpentinite. 35-620 meters.	Unlikely. Species usually occurs on serpentine substrates, which are lacking in Study Area. Species known from only a few extant occurrences.	No further actions are recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
hairless popcorn flower <i>Plagiobothrys glaber</i>	List 1A (March- May)	Often on serpentinite in alkaline meadows and seeps, marshes and swamps. 15-180 meters.	No potential. Suitable habitat is not present in Study Area.	No further actions are recommended.
Petaluma popcorn flower <i>Plagiobothrys mollis</i> var. <i>vestitus</i>	List 1A (June-July)	Mesic valley and foothill grassland, possibly margins of coastal salt marshes. 10-50 meters.	No potential. Suitable habitat is not present in Study Area.	No further actions are recommended.
North Coast semaphore grass <i>Pleuropogon hooverianus</i>	ST; List 1B (April- August)	Open, grassy, mesic areas in broadleaf upland forest, meadows and seeps, North Coast coniferous forest. 10-671 meters.	Unlikely. Suitable habitat is limited to non-existent in Study Area.	No further actions are recommended.
Marin knotweed <i>Polygonum marinense</i>	List 3 (May- August)	Coastal salt marshes and brackish marshes. 0-10 meters.	No potential. The Study Area lacks suitable habitat.	No further actions are recommended.
Tamalpais oak <i>Quercus parvula</i> var. <i>tamalpaisensis</i>	List 1B	Lower montane coniferous forest. 100-750 meters.	No potential. Study Area lacks suitable habitat.	No further actions are recommended.
Point Reyes checkerbloom <i>Sidalcea calycosa</i> ssp. <i>rhizomata</i>	List 1B (April- September)	Freshwater marshes and swamps near the coast. 3-75 meters.	No potential. The Study Area lacks suitable habitat.	No further actions are recommended.
Marin checkerbloom <i>Sidalcea hickmanii</i> ssp. <i>viridis</i>	List 1B (May-June)	Serpentinite in chaparral. 50-430 meters.	No potential. No serpentine substrate is present in Study Area.	No further actions are recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Santa Cruz microseris <i>Stebbinsoseris decipiens</i>	List 1B (April-May)	Open areas in broadleaf upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. On loose or disturbed soil, sometimes on serpentinite. 10-500 meters.	No potential. Suitable habitat limited or nonexistent in Study Area, and species usually on seaward slopes.	No further actions are recommended.
Tamalpais jewel-flower <i>Streptanthus batrachopus</i>	List 1B (April-July)	Serpentinite in closed-cone coniferous forest, chaparral. 305-650 meters.	No potential. No serpentine substrate is present in Study Area.	No further actions are recommended.
Mt. Tamalpais jewel-flower <i>Streptanthus glandulosus</i> ssp. <i>pulchellus</i>	List 1B (May-July)	Serpentinite in chaparral, valley and foothill grassland. 150-800 meters.	No potential. No serpentine substrate is present in Study Area.	No further actions are recommended.
Tiburon jewel-flower <i>Streptanthus niger</i>	FE; SE; List 1B (May-June)	Serpentinite in valley and foothill grassland. 30-150 meters.	No potential. No serpentine substrate is present in Study Area.	No further actions are recommended.
Suisun Marsh aster <i>Symphyotrichum (Aster)</i> <i>lentum</i>	List 1B (May- November)	Brackish and freshwater marshes and swamps. 0-3 meters.	No potential. This species is limited to low-elevation marsh habitats which are not present in the Study Area	No further actions are recommended.
two-fork clover <i>Trifolium amoenum</i>	FE; List 1B (April-June)	Coastal bluff scrub, valley and foothill grassland. Sometimes on serpentinite, roadsides, swales, or cliff faces. 5-415 meters.	Moderate. Limited suitable habitat may be present in Study Area.	Species not found during May protocol level survey. No further action is recommended.
saline clover <i>Trifolium depauperatum</i> var. <i>hydrophyllum</i>	List 1B (April-June)	Marshes and swamps, vernal pools, swales. Mesic, sometimes alkaline sites in valley and foothill grassland. 0-300 meters.	Unlikely. Suitable habitat is limited to nonexistent in Study Area.	Species not found during May protocol level survey. No further action is recommended.

SPECIES	STATUS* (Blooming Period)	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
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*** Key to status codes:**

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
SE	State Endangered
ST	State Threatened
SR	State Rare
List 1A	CNPS List 1A: Plants presumed extinct in California
List 1B	CNPS List 1B: Plants rare, threatened or endangered in California and elsewhere
List 2	CNPS List 2: Plants rare, threatened, or endangered in California, but more common elsewhere
List 3	CNPS List 3: Plants about which CNPS needs more information (a review list)