Botanical Survey Report

For

North Meadow

University of California Berkeley
Richmond Field Station

June 6, 2025

Prepared for:

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1 Introduction

Denise Duffy & Associates (DD&A) was contracted by U.C. Berkeley (University) to conduct a botanical survey of an approximately 4.34-acre area known as North Meadow at the Richmond Field Station (RFS), located in Richmond, California. The approximately 196-acre RFS is owned and operated by the University for research and education. The RFS is situated along the eastern edge of San Francisco Bay and has notable occurrences of remnant coastal terrace prairie in many of its currently undeveloped areas. Coastal terrace prairie is recognized by the California Department of Fish and Wildlife (CDFW) in the *California Natural Diversity Database* (CNDDB) and its characteristic vegetation alliances are included as sensitive natural communities in the *California Natural Communities List*, which identifies habitats that are rare or endangered within the borders of California (CDFW, 2025).

The University has developed guidelines for protecting and restoring coastal prairie as outlined in the Richmond Bay Campus Coastal Terrace Prairie Management Plan (Stromberg, 2014). In addition, the 2014 Long Range Development Plan (LRDP) for the RFS and the LRDP Environmental Impact Report (EIR; Tetra Tech, 2014) identify mitigation requirements associated with potential impacts from development projects on coastal prairie. Specifically, the University is required to conduct a site-specific botanical survey prior to implementing development on any coastal prairie occurrences outside of the Natural Open Space Land Use Zone.

Therefore, the survey focused on characterizing and mapping the current extent of coastal terrace prairie within North Meadow to support future planning activities at the RFS. The 2025 survey supplements and updates previous botanical surveys performed at the RFS, including but not limited to studies by Wildlife Research Associates (2013), URS (2007) and David Amme Associates (1993).

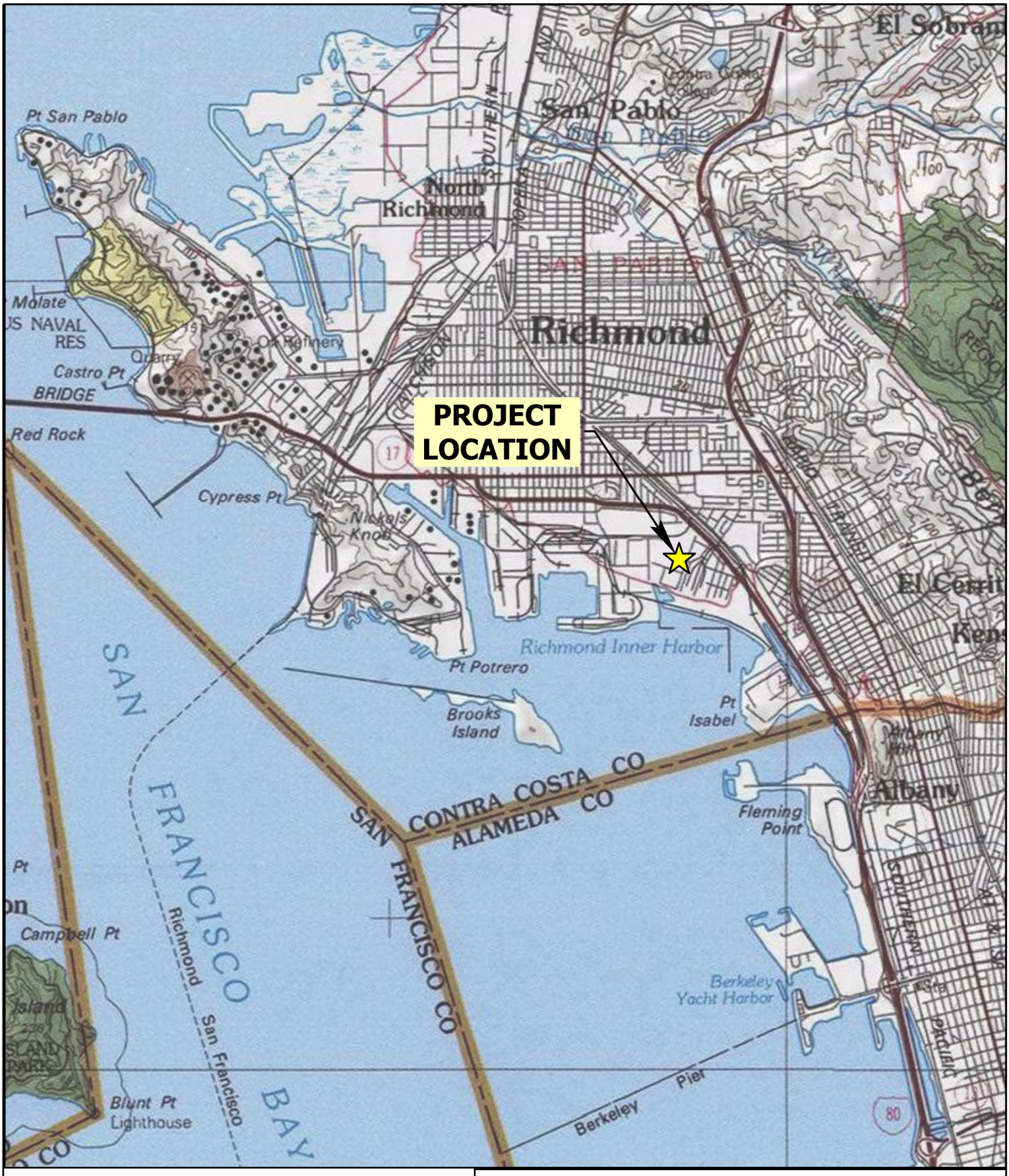
1.1 Site Location

The RFS is located south of Regatta Boulevard and Highway 580 in Richmond, Contra Costa County, California. North Meadow is situated in the central portion of the RFS and is accessed via Egret Way. West of North Meadow lies Big Meadow, the largest occurrence of coastal prairie at the RFS. The San Francisco Bay and Stege March lie approximately 0.4 kilometers towards the south (**Figure 1**). North Meadow is located outside of the jurisdiction of the Bay Conservation and Development Commission (BCDC).

2 Methods

2.1 Survey Timing

The survey was performed on May 7, 2025, by John Wandke and Rikki Lougee of DD&A. The late-spring timing of the survey was adequate to identify most plant taxa to a species level.



Project Location Map

UC Berkeley - Richmond Field Station

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Denise Duffy and Associates, Inc.
Planning and Environmental Consulting

Date 6-2025

Scale 1:63,360

Figure 1

Path: C:\JWandkeGIS\GIS_Projects\2025-24 UC Berkeley North Meadow\2025-24 UC Berkeley North Meadow.aprx

2.2 Coastal Prairie Definitions

Coastal terrace prairie is characterized as a mesic grassland community (Amme, 2005). At the RFS, coastal terrace prairie aligns most closely with the California oat grass prairie and purple needlegrass grassland herbaceous alliances described in Sawyer et al. (2009). Literature reviewed as part of this study does not provide a consistent definition of coastal prairie in terms of plant composition and cover, although generally it is associated with the presence of California oat grass (*Danthonia californica*), purple needlegrass (*Stipa pulchra*), other perennial bunchgrasses, sedge species (*Carex* sp.), and oftentimes a diverse assemblage of flowering forbs, such as blue-eyed grass (*Sisyrinchium bellum*), California buttercup (*Ranunculus californicus*), sun cups (*Taraxia ovata*), button celery (*Eryngium arnatum*), mule's ears (*Wyethia angustifolia*), hairy gumplant (*Grindelia hirsutula*), and others. Coastal prairie is often invaded by non-native annual and perennial grasses and other herbaceous plants, especially in areas of soil disturbance.

Sawyer et al. (2009) note that membership rules in the California oat grass prairie alliance include >25% absolute cover of California oatgrass while the membership rules of the purple needlegrass alliance require >5% absolute cover of purple needlegrass. A previous study by Wildlife Research Associates (2013), which supported preparation of the EIR (Tetra Tech, 2014), found that the least disturbed coastal terrace prairie stands at the RFS contain 50% cover of native prairie species while more disturbed areas were found to contain 10% to 50% cover of native prairie plant species. Their study ranked coastal prairie occurrences at the RFS based on cover of the key perennial grass indicator species of California oatgrass and purple needlegrass:

- High quality: California oatgrass (>50%) and/or purple needlegrass (20%)
- Medium quality: California oatgrass (25%-50%) and/or purple needlegrass (5%-19%)
- Low quality: California oatgrass (0%-24%) and/or purple needlegrass (0%-4%)

Therefore, for this study, we set the definition of coastal prairie based on the Sawyer et al. (2009) criteria as those areas that contain >25% absolute cover of California oatgrass and/or >5% absolute cover of purple needlegrass and used the Wildlife Research Associates (2013) ranking system of low, medium, or high.

2.3 Mapping and Quantitative Sampling

At the RFS, the boundary between coastal terrace prairie stands dominated by native perennial bunchgrasses and adjacent non-native grassland is generally discernable to a trained eye. During the May 7, 2025, survey, DD&A visually identified the boundary of remnant coastal prairie and performed mapping with hand-held resource-grade GPS (i.e., accuracy <1 meter). Isolated occurrences of native prairie species less than approximately 100 square feet in area were not mapped. The field GPS data was post-processed for display in GIS software. In addition, quantitative sampling of point intercept transects was performed within the mapped coastal prairie occurrences to confirm that the absolute cover threshold defined above was met. The point

intercept method works well with mat forming plants, shrub species and grasses (Elzinga et al. 1998). Plant species were identified according to Baldwin et al. (2012).

Data was collected along a total of seven point intercept transects, each 50 feet in length, except for one transect (T4) that was 30 feet in length (**Figure 2**). Percent native and non-native vegetation cover was measured at one-foot intervals. At each point interception, either native/non-native plant species, bare ground, or plant litter was recorded. Only the species of plant rooted directly below the point was recorded. Absolute aerial percent cover for each transect was calculated by dividing the number of hits for each category by the total number of sampling points (i.e., 50 points for a 50-foot transect).

3 Results

Observations of North Meadow during May 2025 found that the area is dominated by non-native invasive grasses and other herbaceous species. The presence of foreign materials (i.e., pieces of concrete, asphalt) and a ditch adjacent and parallel to Egret Way indicates a history of disturbance. These observations are generally consistent with previous observations reported by URS (2007) and Wildlife Research Associates (2013), which ranked North Meadow as low quality.

However, the May 2025 survey found that five isolated stands of remnant coastal terrace prairie occur within North Meadow (**Figure 2, Table 1**) and occupy approximately 0.35 acre. Generally, these remanent occurrences are found in slight topographic depressions and are dominated by California oatgrass with lesser amounts of purple needlegrass. Although in some areas absolute cover of native prairie species is quite high (i.e., 30% - 46%), the remnant coastal prairie at North Meadow lacks the forb diversity found at nearby Big Meadow. Only isolated forbs such as blue-eyed grass and white brodiaea (*Triteleia hyacinthina*) were noted (see **Appendix A** for a plant species list). Nevertheless, the dominance of California oatgrass and/or purple needlegrass qualifies the areas shown on **Figure 2** as coastal terrace prairie. Therefore, per the RFS EIR mitigation measures (Tetra Tech, 2014), impacts to these occurrences would require compensatory mitigation.

Table 1. Summary of Coastal Prairie Occurrences at North Meadow

Occurrence No.	Area (Ac)	% Cover California oatgrass	% Cover Purple Needlegrass	% Total Native Cover[1]	Quality[2]
Coastal Prairie 1	0.18	39%	7%	46%	Medium
Coastal Prairie 2	0.05	15%	6%	30%	Medium
Coastal Prairie 3	0.05	40%	0%	40%	Medium
Coastal Prairie 4	0.03	30%	0%	30%	Medium
Coastal Prairie 5	0.04	2%	16%	18%	Medium
Sum	**0.35**				

Notes:
1. Total % cover of California oatgrass, purple needlegrass, and other native prairie species
2. Quality rank based on Wildlife Research Associates system (2013)

Coastal Prairie
Quality
Medium

Transects
Survey Area

0 25 50 100 Feet

North Meadow - Coastal Prairie Occurrences

UC Berkeley - Richmond Field Station

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Date 6-2025
Scale 1 in = 100 ft
Figure 2

Path: C:\JWandkeGIS\GIS_Projects\2025-24 UC Berkeley North Meadow\2025-24 UC Berkeley North Meadow.aprx

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APPENDIX A

Plant Species List

Appendix A – Plant Species List
UC Berkeley Richmond Field Station
May 7, 2025

Botanical Name	Common Name
Acacia sp.	Acacia
Aira caryophyllea	Silvery hairgrass
Anagallis arvensis	Scarlet pimpernel
Avena barbata	Slender wild oat
Brachypodium distachyon	False brome
Bromus carinatus	California brome
Bromus diandrus	Ripgut brome
Bromus hordeaceus	Soft chess
Bromus madritensis	Foxtail chess
Bromus vulgaris	Columbia brome
Carduus pycnocephalus	Italian thistle
Carex tumulicola	Foothill sedge
Convolvulus arvensis	Field bindweed
Cortaderia jubata	Andean pampas grass
Cotoneaster sp.	Cotoneaster
Danthonia californica	California oatgrass
Erodium botrys	Big heron bill
Eucalyptus globulus	Blue gum
Festuca myuros	Rattail fescue
Festuca perennis	Perennial rye grass
Festuca rubra	Red fescue
Foeniculum vulgare	Sweet fennel
Galium aparine	Goose grass
Geranium dissectum	Wild geranium
Helminthotheca echioides	Bristly oxtongue
Heteromeles arbutifolia	Toyon
Hordeum brachyantherum	Meadow barley
Hordeum murinum	Foxtail barley
Hypochaeris radicata	Hairy cats ear
Linum bienne	Narrow-leaved flax
Lotus corniculatus	Bird's foot trefoil
Phalaris aquatica	Harding gras
Plantago lanceolata	English plantain
Rumex acetosella	Sheep sorrel
Rumex crispus	Curly dock
Sisyrinchium bellum	Blue eyed grass
Stipa pulchra	Purple needlegrass

Botanical Name	Common Name
Toxicodendron diversilobum	Poison oak
Trifolium sp.	Clover
Triteleia hyacinthina	White brodiaea
Vicia sp.	Vetch
Vicia villosa ssp. *villosa*	Hairy vetch