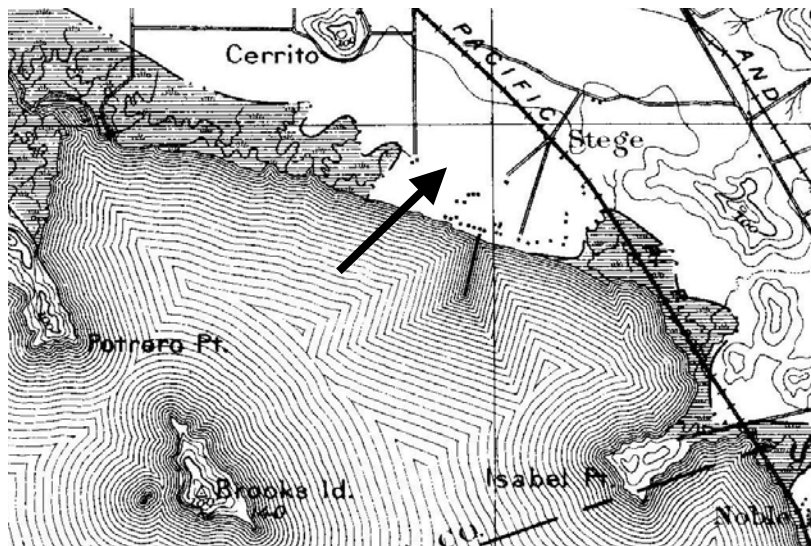


UC Richmond Field Station's Remnant Coastal Terrace Grassland

by David Amme

Perhaps the last known undisturbed native coastal terrace grassland adjacent to the San Francisco Bay shoreline resides on the University of California Richmond Field Station. Prior to the purchase of this choice piece of real estate by the University, it came very close to being destroyed by the Leviston Estate housing development in the early 1900's. This was back in the time when streets were being extended into the bay and given exotic names to encourage people to purchase lots. By the 1920's the area was surveyed, the sidewalks were already poured, and the streets were outlined with redwood curbs ready for asphalt. For a combination of reasons, perhaps the Great Depression followed by World War II, the development was never completed and the land remained vacant until the 1950's when the University expanded its Richmond Field Station to 32nd Street. The interior of each block was never cultivated or graded and today the actual land surface inside the sidewalks is still intact. If one looks closely the sidewalks can still be found, albeit broken up and slowly being transformed into a prairie soil. Between 1963 and 1988 the Museum of Vertebrate Zoology utilized a portion of the vacant land for small mammal enclosure experiments to study small mammal population densities and their interact with the grassland composition (Lidicker 1989). Ironically, in the late 1980's a large EPA Laboratory building was constructed on top of a portion of this prairie close to the Bay shore.



The Richmond Field Station coastal terrace prairie exists on the natural alluvium bluff northwest of the pier between Cerrito Hill and Isabel Point in the hamlet of Stege in the 1890's. Arrow marks Leviston Estates.

A coastal terrace prairie plant community by definition is a mesic (moist) grassland. Annual rainfall is generally between 35 and 60 inches per year. The coastal prairie grassland exists within the coastal fog belt where summer evapotranspiration rates are low. The coastal terrace prairie exists in California intermittently along the coast from the Oregon border to San Simeon, San Luis Obispo County (Heady *et al.* 1977). The largest expanses of this vegetation type once existed on clay loam soils in west Marin County, the central East Bay lowlands (Alameda to Richmond), the coastal lowlands of Monterey Bay, and the coastal lowlands in the vicinity of San Simeon below Hearst Ranch. Cultivation (associated with growing potatoes, grain, silage, and vegetable crops), overgrazing (associated with dairy farming and sheep

grazing), and urbanization has almost completely eliminated this plant community. Today, only a few remnant stands of coastal prairie remain.

The remnant coastal terrace prairie plant community of the Richmond Field Station totals approximately 6½ acres within an overall 14 acre openspace stretching from the original shoreline to approximately a quarter of a mile inland. The soil is a poorly drained clay of the Clear Lake Series that often forms a perched water table in the winter rainy season (SCS 1977). The grassland is a level terrace or alluvium deposit approximately 10 feet above mean high tide. California oatgrass (*Danthonia californica*) is the dominant cover in the coastal terrace grassland. In the spring and summer months the signature of California oatgrass are the prostrate arching flowering culms laying on the ground. Even if the few seeds of the small panicle fail to pollinate or ripen, these culms are full of good seed hidden behind each of the swollen leaf sheaths.



Typical summer signature of a mature *Danthonia* grassland with prostrate flowering culms laying on the ground.

Depending on the type of site or moisture regimen, a rich assortment of native perennial grasses, forbs and woody perennials are found mixed with the California oatgrass comprising the coastal terrace plant community. These include purple needlegrass (*Nassella pulchra*), slender wheatgrass (*Elymus trachycaulus*), squirreltail (*Elymus multisetus*), mules ears (*Wyethia angustifolia*), meadow barley (*Hordeum brachyantherum*), iris-leaved rush (*Juncus phaeocephalus paniculatus*), western rush (*Juncus occidentalis*), spreading rush (*J. patens*), slender rush (*J. tenuis congestus*), wood rush (*Luzula comosa*), foothill sedge (*Carex tumulicola*), buttercup (*Ranunculus californica*), blue-eye grass (*Sisyrinchium bellum*), button-celery (*Eryngium arnatum*), morning glory (*Calystegia occidentalis*), sun cups (*Camissonia ovatum*), ladies tresses (*Spiranthes porrifolia*), phacelia (*Phacelia californica*), tarweed (*Madia elegans vernalis*), yarrow (*Achillea millefolium*), mugwort (*Artemisia douglasiana*), aster (*Aster chilensis*), gumplant (*Grindelia hirsutula*), and coyote brush (*Baccharis pilularis*). The only exotic species to successfully penetrate the “closed” coastal terrace grassland are annual hairgrass (*Aira caryophyllea*), catsear (*Hypochoeris radicata*), and English plantain (*Plantago lanceolata*).

The presence of the slender wheatgrass at this site is a significant botanical discovery. Lowland ecotypes of slender wheatgrass are very rare. In the greater Bay Area, slender wheatgrass is found in the Berkeley-Oakland Hills on clayey serpentinite soils. At the field station, rather than appearing as an assemblage of bunchgrasses like blue wildrye (*Elymus glaucus*), slender wheatgrass creep out from the base, developing a pure stand of upright flowing culms.



Dense stand of slender wheatgrass on the UC Richmond Field Station.

The coastal terrace grassland is surrounded by disturbed exotic grassland with the usual cast of characters, including annual ryegrass, Italian foxtail, soft chess, ripgut, slender oats, Italian thistle, bristly oxtongue, sowthistle, filaree, mallow, dock, and black mustard. Where the grassland is constantly mowed within the field station campus, California oatgrass has become the dominant ground cover. In the unmowed grassland that surrounds the remnant coastal community, the disturbed annual grassland dominates. Here, pure stands of the robust perennial Hardinggrass (*Phalaris aquatica*) are rapidly moving into the coastal terrace grassland from three sides, and patches of the biennial teasel (*Dipsacus fullonum*), associated with rodent disturbance, seem to be blowing holes within this unique plant community. In the last ten years the Hardinggrass has made significant inroads into the coastal terrace plant community. Lurking in the background are localized patches of kikuyu grass (*Pennisetum clandestinum*), Bermudagrass (*Cynodon dactylon*), fennel (*Foeniculum vulgare*), dallisgrass (*Paspalum dilatatum*), pampasgrass (*Cortaderia selloana*) and the dreaded Bermuda buttercup (*Oxalis pes-caprae*).

In 1993 the University of California began a master planning process to develop the Richmond Field Station as a research center development. This effort is continuing today as a Bayside Research Campus Development. The site's waterfront and marsh area is currently part of a five-year phased environmental remediation project cleaning up chemical and heavy metal deposits caused by previous industrial activities at the site. For now the remnant coastal terrace prairie is safe from development. The University of California Real Estate Group has mapped out a 12 acre native grassland area that comprises the remnant coastal terrace plant community. Still, it must always be kept in mind that the coastal terrace plant community has no special status *per se* that can prevent it from development. In order to achieve compliance with the

California Environmental Quality Act (CEQA) developers rely on transplantation and translocation of rare plants and plant associations to “mitigate” for their demise. These types of schemes do not recreate the function of the ecosystems in which target plants are found (Skinner 1993). One of the most obvious plant community resources—the soil horizon—is rarely considered in the mitigation process. Can the above-ground prairie vegetation exist on a new site without the below-ground structure and biological relationships that are associated with the soil profile? The remnant coastal terrace plant community at the Richmond Field Station is scientifically and ecologically invaluable, and virtually impossible to recreate.

A dedicated non-profit environmental educational organization (The Watershed Project) based on the Richmond Field Station has recently received funding to restore and manage the coastal terrace prairie at the field station and is now gearing up to beat back the Hardinggrass and pull out the teasel. They will need the support from the California Native Plant Society and CNGA.

For more information regarding The Watershed Project’s effort contact Wendy Strickland at wendys@thewatershedproject.org or 510.231.9507. The project manager for the UC Berkeley Real Estate Initiative is Kevin Hufferd. He can be contacted at khufferd@cp.berkeley.edu or 510.643.5314 for a copy of the Bayside Research Campus Development Concept Summary.

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