



# PLANT COMMUNITY CREATION RESEARCH IN UPLAND TRANSITIONAL HABITATS

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SFBBO HABITATS PROGRAM

McMillian Construction photo

**Summary**

Estuarine-Terrestrial Transitional Habitats (aka upland ecotone) are an essential component of the tidal marsh ecosystem. They provide necessary habitat to obligate tidal marsh fauna. Their functions are even more critical given ever-increasing rates projected for sea level rise, a likelihood of marsh drowning in place, and the need for marsh migration upslope.

They are also unique habitats in their own right. As transitional habitats they are mixtures of adjacent high marsh and upland plant communities. These zones are created by interactions between estuarine and terrestrial processes, primarily topography and tidal action. These forces create unique conditions that have also led to the evolution of endemic flora.

After a century of urban developments, preceded by a few centuries of European-style agricultural use, and several millennia of indigenous fire management the plant communities are depauperate. Assembling a functional plant community, containing colonizing (early successional), dominant perennial and disturbance-oriented (secondary successional) species has required years of research.

SFBBO Habitats have been developing methods and materials to successfully and feasibly seed native plants across large acreages for seven years. Challenges have included harsh soils, drought, and interactions between them. We continue working to improve our seed palette, striving to conserve local genotypes when found. We are also developing methods for assessing the value of transitional habitat management from the perspectives of endangered species.

**Pond A17**

Restored to tidal action in 2012, this 130-acre pond should passively restore to tidal salt marsh. The pond's fringe levee was lowered to create varied topography, including elevations appropriate to high marsh areas in the lower portions and upland transitional habitats above. Developing marshes will need these habitats in the short-term for high tide refuge, they will need extreme high tide refuge in the mid-term as storms become more frequent, and accommodation space for marshes during rapid SLR in the long term.

High marsh areas have already recruited salt marsh species (photos below). With funding from the Coastal Conservancy's Climate Ready grant program, SFBBO Habitats will be enhancing these plant communities by planting salt marsh gumplant, an important species that does not always recruit well on its own. Upland transitional areas will be seeded with ~30 species and planted with several that do not perform well from direct seeding.

**Bair Island**

**Inner Bair Island will be restored to tidal action on December 10th!**

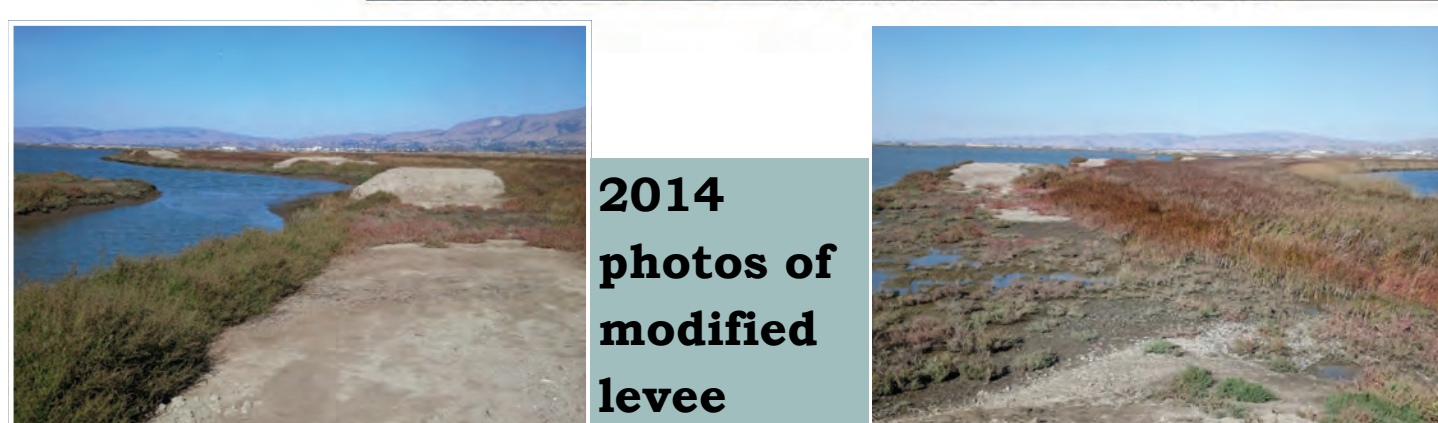
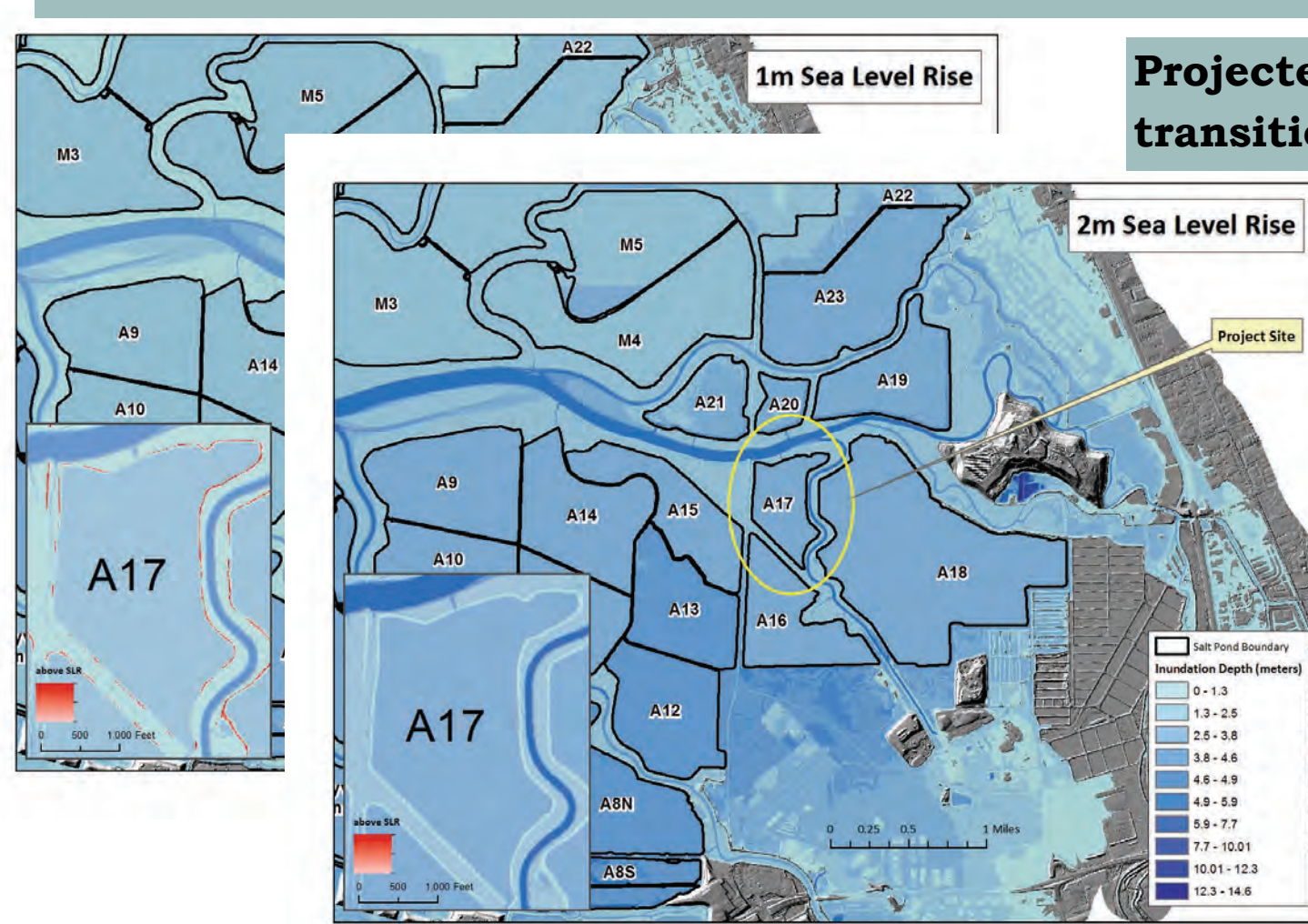
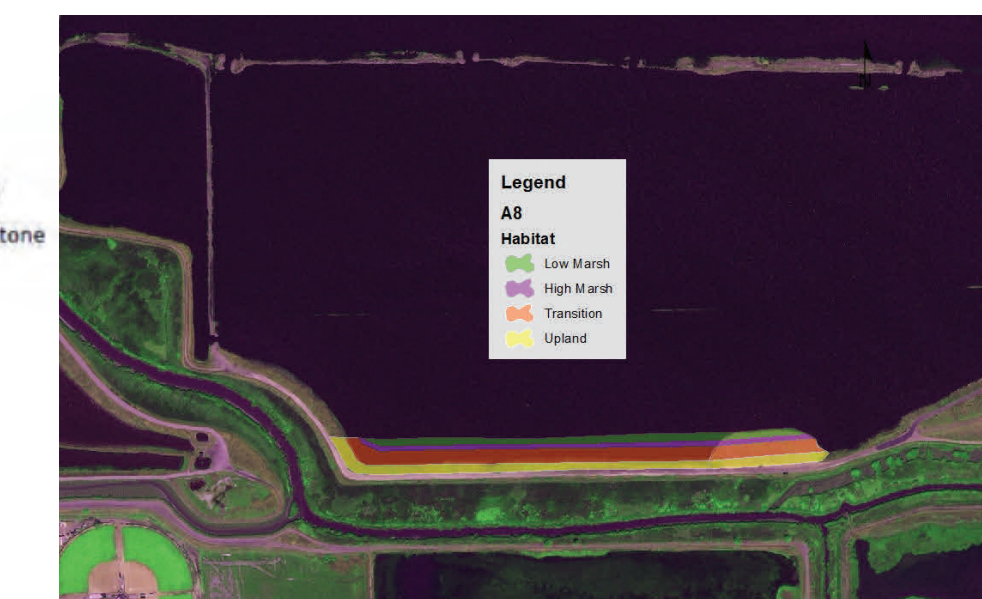
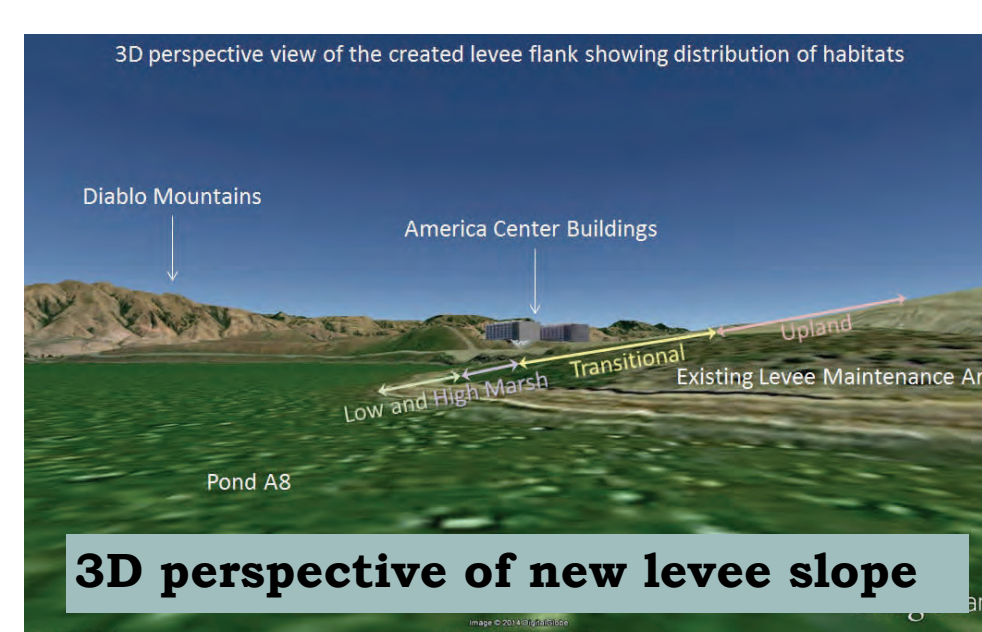
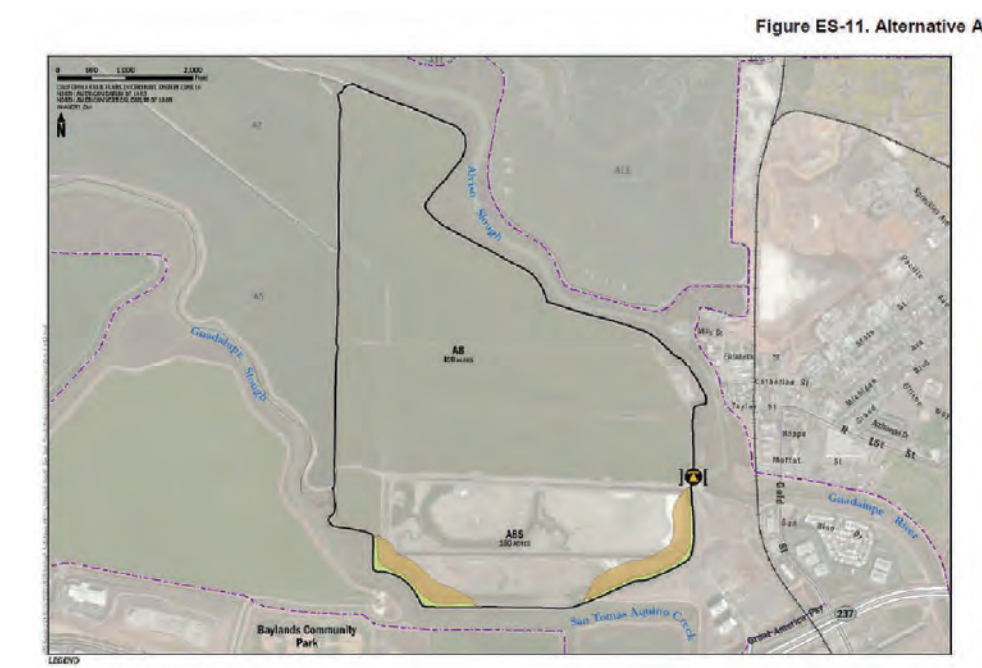
Approximately 25 acres of upland transitional habitats were created throughout the site. Due to the uncertainties involved in plant community creation (e.g. drought), SFBBO Habitats is working with Ducks Unlimited, the Peninsula Open Space Trust, and USFWS to phase the seeding and planting of native plants on approximately 5 acre/year to minimize the weather risk.

Inner Bair includes areas created from dredge spoils and areas created from upland fill soils. A variety of substrates are likely to be used for the creation of transition zone habitat, so methods of plant community creation need to be successful regardless of soil chemistry.

**Pond A8**

SCVWD and USFWS have a partnership to beneficially reuse the SCVWD's Stream Maintenance Program sediment to maintain USFWS Refuge levees. The levee slopes being created are more gradual than traditional trapezoidal levees so they are more stable. This also improves their value as upland transitional habitat, which will further improve their stability.

SFBBO Habitats is partnering with USFWS and SCVWD to create plant communities on these new surfaces. Over the next 5 years we will be collecting and propagating seed and plant stocks to create approximately 15 acres of upland transitional habitats, including associated high marsh and upland communities.



**Outer Bair transitional opportunities?**

**Plan views of Bair Island Phase I**

**Historic Bair Island**

