



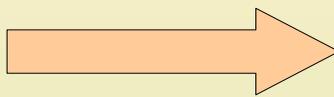
How Long Will It Take For Wetlands To Develop?

Because pasture elevations are relatively similar to undiked areas, the transition should be relatively quick, particularly compared to many wetland restoration projects in San Francisco Bay. However, the pasture grasses that had established in the Giacomini Ranch consisted of species with dense roots, rhizomes (spreading, underground stems), and stolons (spreading, aboveground stems). These grasses, which were somewhat tolerant of saline conditions, would be expected to resist encroachment by new species.

It was estimated that conversion to natural marsh would take a minimum of 10- to 20 years – possibly longer – and would involve establishment of some transitional habitats.

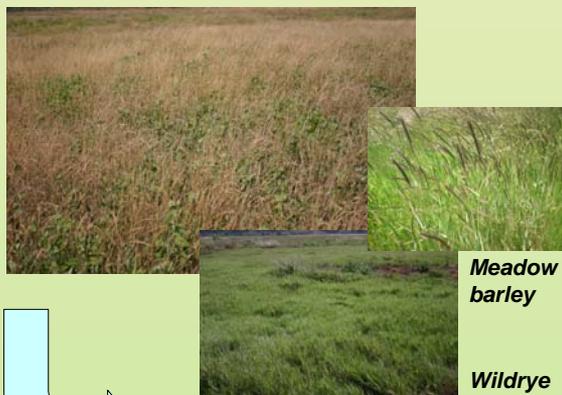


Original Projected Timeline:
10 to 20 Years



Step 1: Encroachment of salt and brackish marsh species into pasture, although pasture grasses are still dominant. Native grasses such as wildrye and meadow barley also expand tremendously.

Timeline: ~ 1-2 years



So, What are We Actually Seeing?

Even without the levees being removed, we are seeing rapid conversion of habitats due to discontinuation of agricultural management – including irrigation of the root zone with freshwater in the summer – and several incidental levee breaches prior to construction. There has also been a resurgence in native grasses such as wildrye and meadow barley.

Because of this, we are now expecting conversion in as little as 5 to 10 years.

Step 5: Conversion to diverse salt marsh community with full tidal inundation

Total Timeline: 5-10 years?



New Projected Timeline:
5 to 10 Years

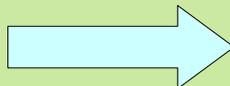
Step 2: Pasture grasses die off with exposure to salt.

Timeline: ~ 1-2 years



Step 3: Fat-hen (*Atriplex triangularis*), a brackish marsh species, moves in, often forming dense colonies.

Timeline: ~ 1-2 years



Step 4: Fat-hen gives way to traditional salt marsh species such as saltgrass and pickleweed, with some areas also having jaumea, often called the salt marsh daisy.

Timeline: ~ 2 years



So Why Do the Tides Cause a Change in Habitats?

Tidal waters cause changes in plant communities, because most plants are not adapted to salt, particularly many of the invasive and weedy non-native species that have changed California's landscapes so dramatically. Plants not typically found in salt marsh or brackish marsh areas cannot cope physiologically with the level of salts in the soil or waters. Marsh plants often have special adaptations to salt.



Saltgrass and cordgrass handle the burden of extra salt absorbed during uptake of water by excreting salt onto their leaves, forming "crystals."



Rather than excrete salt, pickleweed stores salt in vacuoles or special cells in the tips of branches, and the salt eventually kills the tip, which then easily breaks off.