

Oak Woodland Restoration in the East Bay Parks

Natural and Cultural Resources Committee Meeting

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A natural and cultural resource

A photograph of a massive, ancient tree with a thick, gnarled trunk and sprawling, twisted branches. The tree is covered in moss and lichen, indicating its age. The foliage is dense and green, filling the upper part of the frame. The ground is covered in brown leaves and forest floor debris. The text "Some of our oldest and most iconic trees" is overlaid in white on the lower left side of the image.

Some of our oldest and most iconic trees

Oak woodlands are keystone ecosystems

- Thousands of species, from lichen to large mammals
- Over 300 terrestrial vertebrates
- Oak woodlands support other keystone species
- Dominant cover type throughout the Diablo Range
- Oak woodlands are a cultural as well as natural resource





Each oak is its own ecosystem of lichens, crevices, cavities and leaf litter (niches)

Older trees are of vast importance because they host the largest number and diversity of niches

Family groups of acorn woodpeckers use granary trees to store their food source and use multiple trees within a complex as granary trees

Only large, old trees provide this niche



Challenges and threats

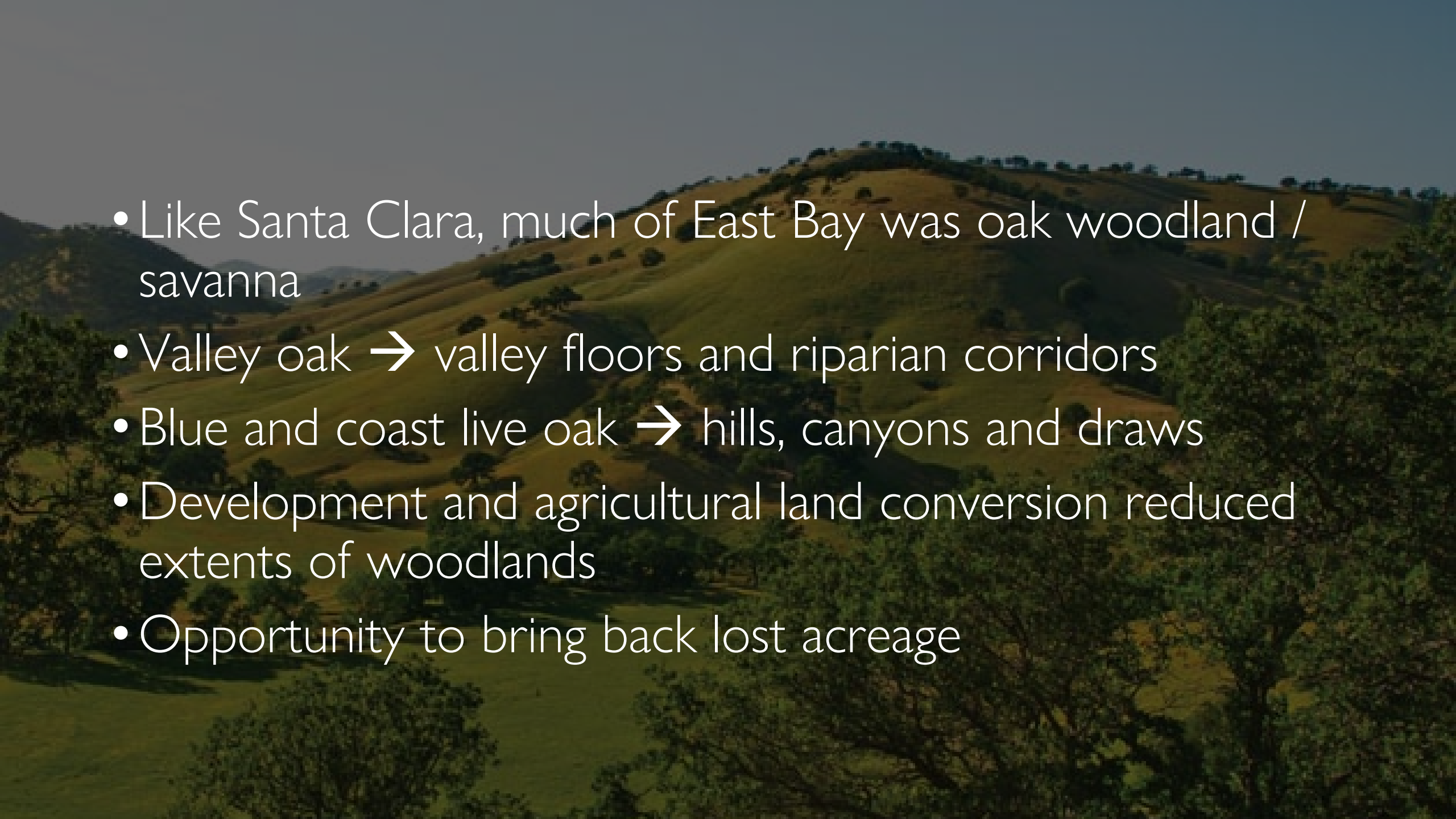
- Decline over past 200 years
- Lack of recruitment
- Grazed areas
- Fire regimes
- Recruitment regimes
- Most oak species do not recruit well under other oaks



Decline in oak cover over time

An aerial photograph showing a landscape with scattered oak trees and open fields. The trees are dark and dense, while the fields are lighter and more open. The overall scene suggests a natural or semi-natural environment.


- Santa Clara Valley Historical Ecology study (SFEI 2008)
- 95% of valley's oaks were lost by 1940
- 50% of those remaining were lost after 1940
- “Without active stewardship to recruit new trees ...valley oaks are likely to disappear from the valley floor in coming decades as older trees die”

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- Like Santa Clara, much of East Bay was oak woodland / savanna
 - Valley oak → valley floors and riparian corridors
 - Blue and coast live oak → hills, canyons and draws
 - Development and agricultural land conversion reduced extents of woodlands
 - Opportunity to bring back lost acreage

The Park District is a big piece of the oak conservation puzzle

- Land acquisition protects oaks
- Restoration to expand extirpated and existing populations
- Leaders in the Diablo Range conservation space
 - Research and restoration initiatives
 - Fine scale vegetation map
 - Historical ecology





Restoration: the process of assisting an ecosystem that has been degraded, damaged, or destroyed

May involve removing harmful species, erosion control, planting, seeding, or other interventions

Why restore ecosystems?

- Parklands have experienced degradation from historic land uses
- Degradation impacts ecosystem function and biodiversity
- Biodiversity = ecosystem resilience
- Restoration supports climate and fire resilience





For oaks, this means planting the next generation of old trees.



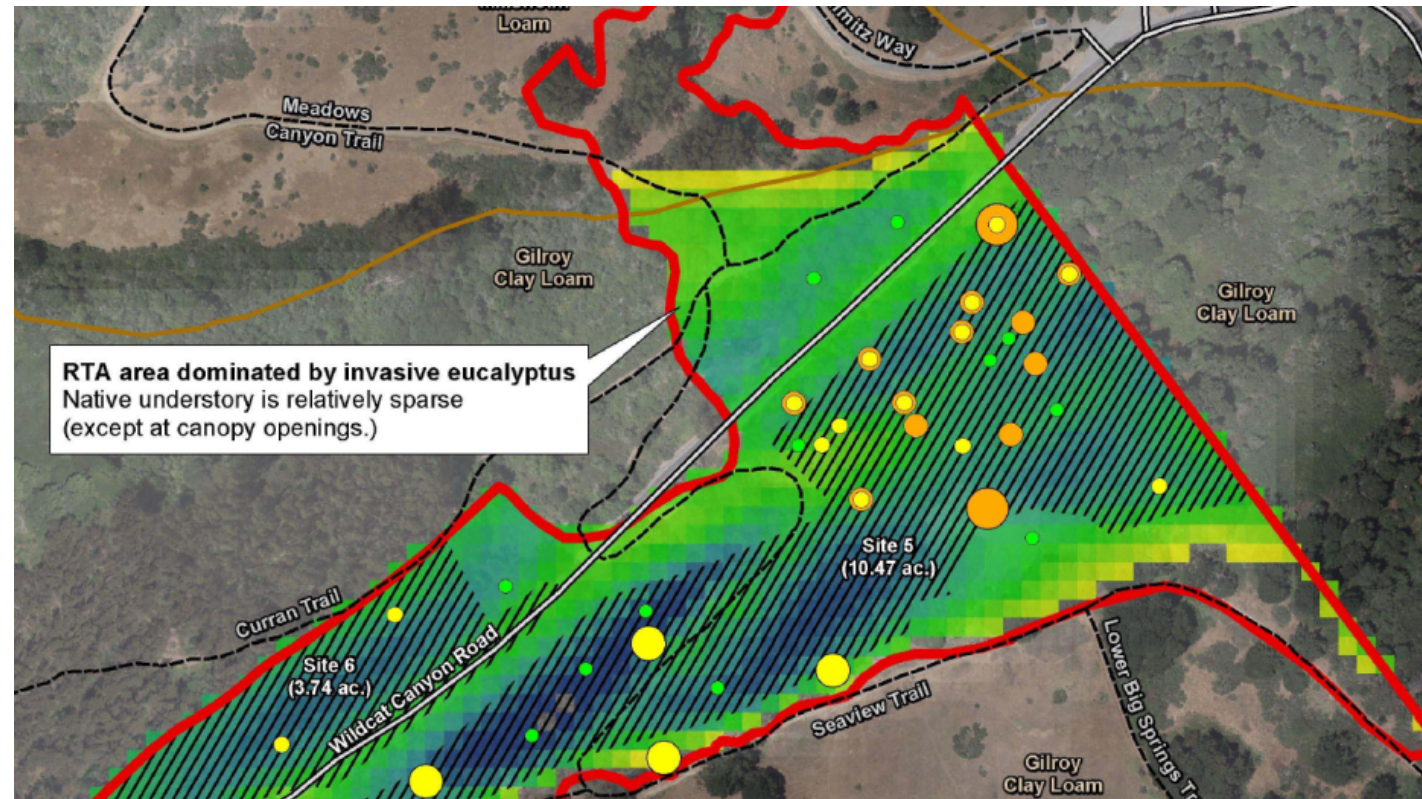
Oak Woodland Restoration Project

- Seed funding from California Native Plant Society
- Matching funds from Measure FF
- Oak Woodland Restoration Plan
- Pilot: 2024
- Scalable



Oak Woodland Project Development

- Habitat suitability analysis: soils, aspect, solar radiation
- Within or near treatment areas
- Where eucalyptus have been or will be removed
- Determined best areas to site restoration projects
- Reference sites provide density and pattern information

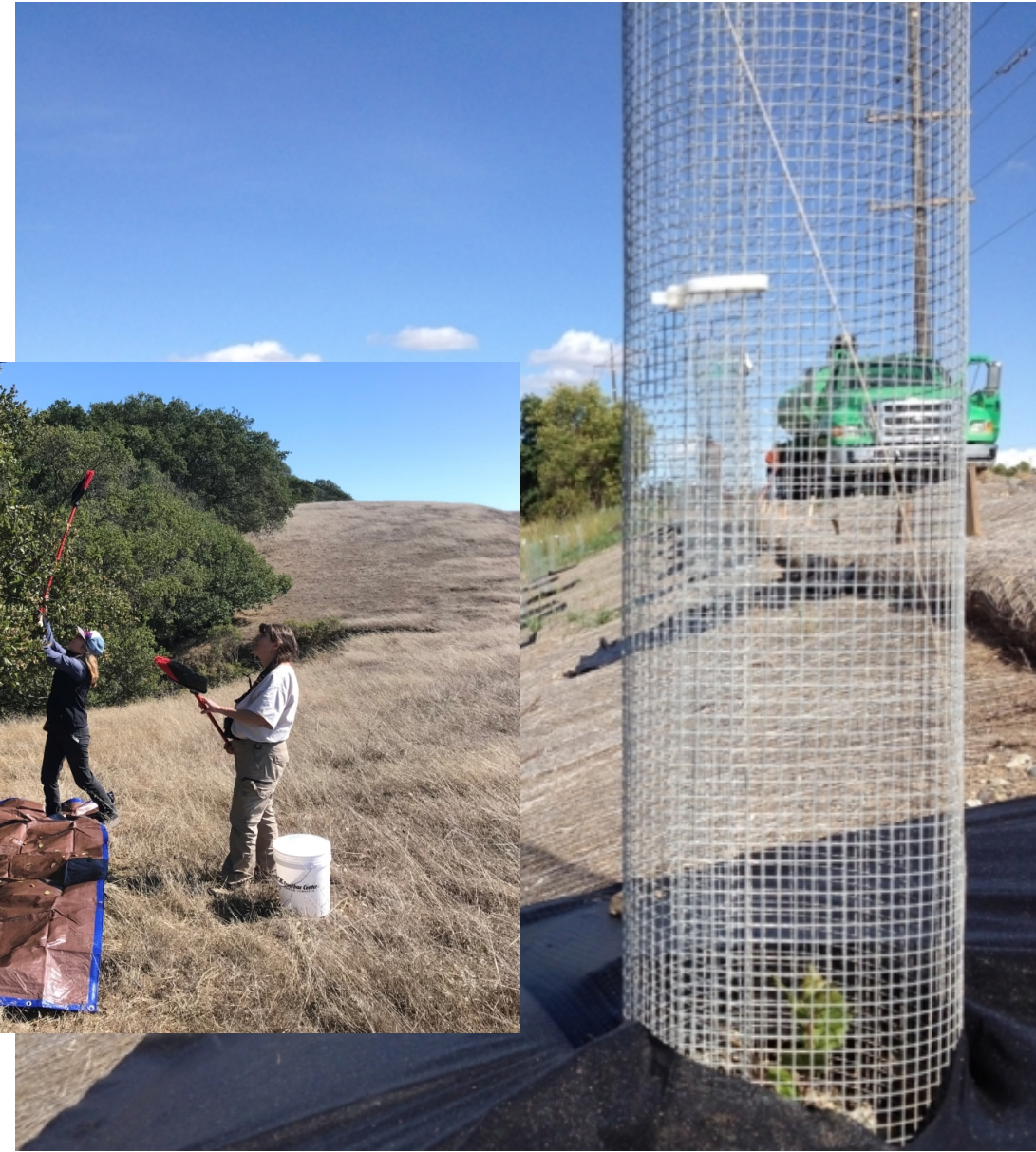




Oak Woodland Reference Site, Anthony Chabot Regional Park

Restoration Methods

- All plants from seed (acorns)
- Collect in fall
- Store under refrigeration
- Plant in wire enclosures
- Multiple seeds per enclosure
- Emergence March - April





Life history and reference information

- Mature stands tell us a lot about future goal conditions
- Oak woodland –
25-60% canopy cover
- Up to 30 trees per acre
- Oak savanna –
10-25% canopy cover
- Fewer than 10 trees per acre
- Cohorts recruit in stand replacement events
- Mature woodlands: most of the trees are the same age/size



Expanding capacity
to implement
restoration

- “Light-touch”
- Scalable
- Low tech
- Cost efficient

An aerial photograph capturing a massive wildfire. A thick, billowing plume of white and grey smoke rises from a forested area, partially obscuring the landscape. The fire is situated next to a body of water, which appears dark green. The surrounding land is a mix of dry, yellowish-brown terrain and patches of green vegetation. The smoke plume is dense and expansive, dominating the right side of the frame.

Post-Fire Restoration

Scenic Fire: June 2022



Scenic Post-Fire Restoration Project



- Removal of burned and dead trees
- Restoration to grassland and oak woodland





October 2023



Planting

Biochar
utilization





Oak ecosystems are fire—resilient



Reference site — 1 mile east



An aerial photograph of a landscape featuring rolling green hills, a winding road, and a body of water in the background. The hills are covered in dense vegetation, and the road curves through the landscape. The water is visible in the distance, and the overall scene is hazy, suggesting a distant or elevated perspective.

Scenic Fire – Future Directions

- First round of planting, winter 2023-24
- Seed collection for restoration
- Monitor success
- Return grazing to park
- Continue to remove eucalyptus from project site
- Funding needed for future restoration



Overarching goals

- Increase acreage of oak woodland
- Increase connectivity of restored lands
- Reverse habitat simplification
- Convert from carbon source to sink in 30-40 years
- 30x30 biodiversity integration



To improve fire adaptation, management and policy decisions must reflect the specific needs of the diverse ecosystems in fire-prone regions. Nuanced, ecosystem-specific approaches [are] essential for robust conservation and wildfire management.

Calhoun et al 2021