

Exhibit to Agenda Item #1

Provide the Board presentations by external and internal experts regarding Nature-Based Carbon Solutions & Biodiversity followed by a discussion on the topic.

Board Strategic Development Committee and Special SMUD Board of Directors Meeting

Tuesday, June 11, 2024, scheduled to begin at 6:00 p.m.

Nature-Based Carbon Solutions & Biodiversity

Strategic Development Committee
June 11, 2024



Agenda

Background

Guest Speakers

- Carbon Farming: Toward a Climate Beneficial and Resilient Agriculture - Jonathan Wachter, Carbon Cycle Institute
- Biodiversity, Pollinators & Nature-Based Solutions in the Electric Power Industry - Jessica Fox, EPRI

SMUD's Current Efforts

- T&D Corridors
- Facilities & Environmental Services
- Generation Projects
- Community Collaborations

Opportunities

- Carbon Farm Planning for SMUD





California Floristic Province

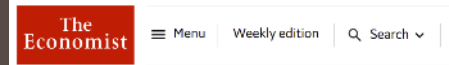


Biodiversity loss accelerates with 1 million species at risk of extinction, UN report finds

Nation May 6, 2019 9:46 AM EDT

Our Response to Climate Change Is Missing Something Big, Scientists Say

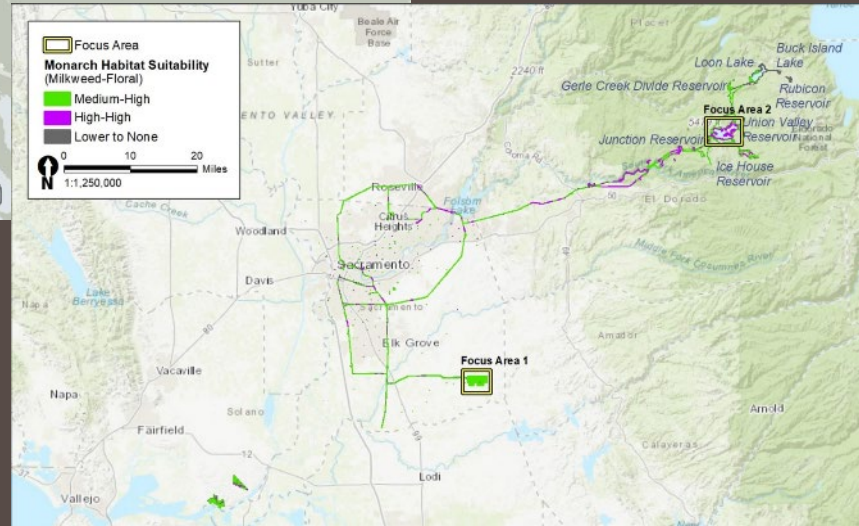
Yes, planting new trees can help. But intact wild areas are much better. The world needs to treat warming and biodiversity loss as two parts of the same problem, a new report warns.



Technology Quarterly
Jun 15th 2021 edition >

The other environmental emergency

Loss of biodiversity poses as great a risk to humanity as climate change



Biodiversity loss is accelerating

Electric utilities are not the main cause of biodiversity loss, but we can help address it with land assets we manage



Customers & Other Stakeholders Care

2022 SMUD Customer Survey on Biodiversity



85% of respondents are very or somewhat concerned about the decrease in biodiversity in California. 89% of respondents strongly or somewhat support SMUD in adopting a 30x30 Biodiversity Plan.

The majority of respondents (75%) were not aware of SMUD's current efforts to support biodiversity, and when those efforts were described, 85% said that it had a positive impact on their opinion of SMUD



51% of respondents believe that SMUD should take on a great deal of responsibility in supporting biodiversity and sustaining healthy ecosystems at the sites of large-scale renewable energy projects and another 42% believe they should take on a moderate amount. Only 3% said SMUD does not have a responsibility to support biodiversity.

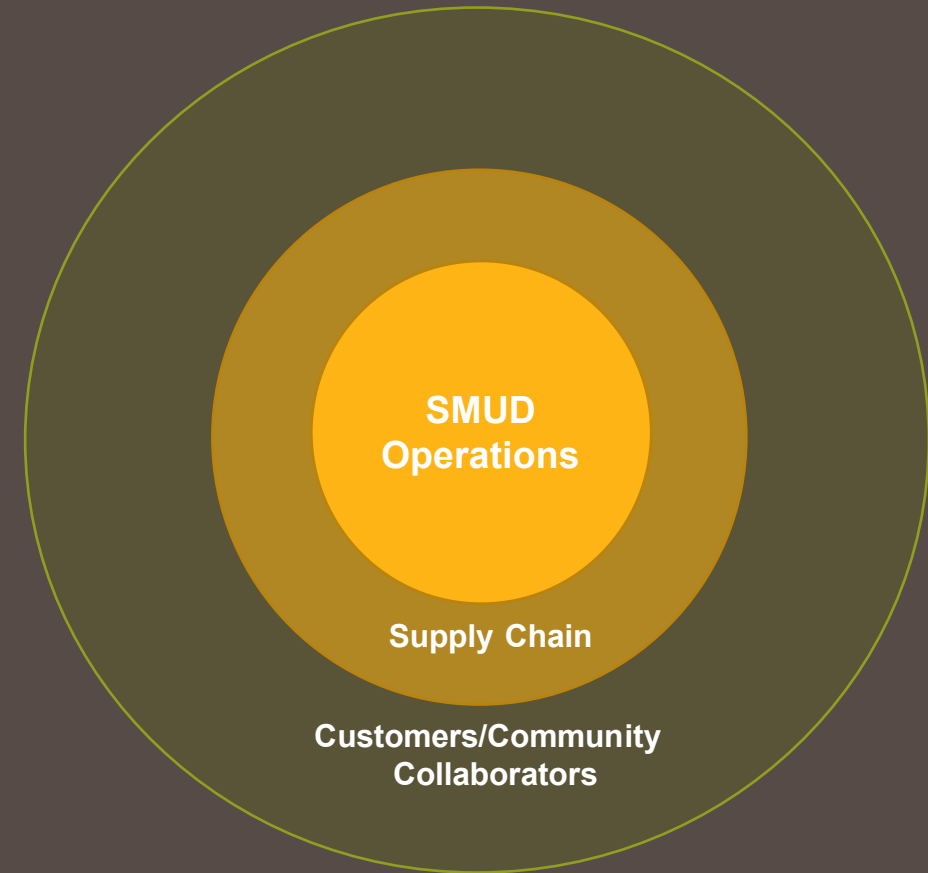


Staff-Led Biodiversity & Habitat Working Group Supports 2030 Sustainable Operations Plan / SMUD Green Team



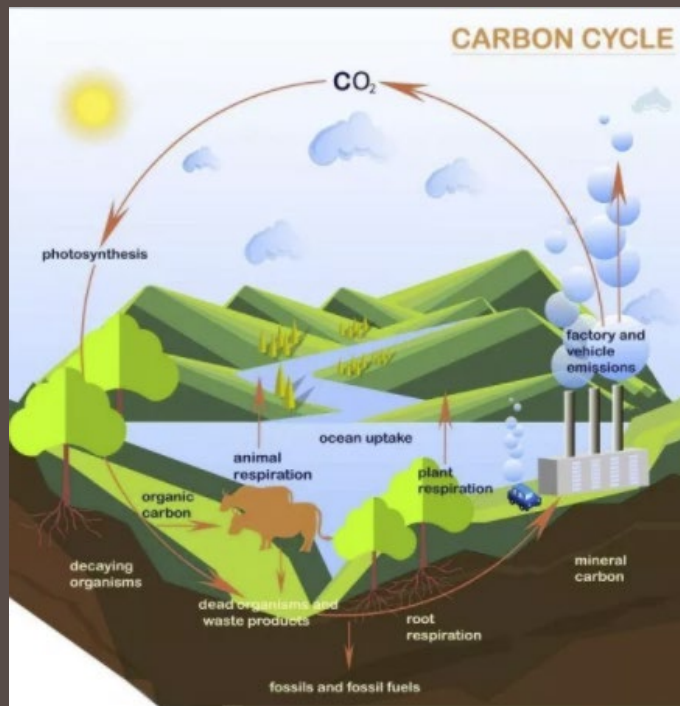
Team Members:

Real Estate
Environmental Services
Customer & Grid Strategy
Power Generation
Vegetation Management
Customer Programs
Communications
Market Research
Facilities
Energy Trading & Contracts
Legal
Sustainable Communities



Major Goal: Completion of SMUD's Habitat Conservation Plan

“Nature-Based Solutions” address climate and biodiversity, sequestering carbon in natural spaces



biologydictionary.net

Photosynthesis and other biological processes store carbon in soil and biomass

These natural systems can be protected and enhanced to increase CO₂ removal from the atmosphere

JANUARY 2019 DRAFT California 2030 Natural and Working Lands Climate Change Implementation Plan

Land-based GHG Reduction Strategies

- Improved nitrogen fertilizer management
- Replacing synthetic nitrogen fertilizer with soil amendments
- Oak woodland restoration
- Cover crops
- Mulching
- Riparian restoration
- Urban forestry
- Hedgerow planting
- Avoided conversion to croplands
- Avoided conversion to urban
- Compost application to grasslands
- Native grassland restoration

Carbon Farming: Toward a Climate Beneficial and Resilient Agriculture

Jonathan Wachter, Carbon Cycle
Institute

Biodiversity, Pollinators & Nature-based Solutions in the Electric Power Industry

Jessica Fox, EPRI

SMUD's Current Efforts



Transmission & Distribution Corridors




Integrated Vegetation Management (IVM) Strategy

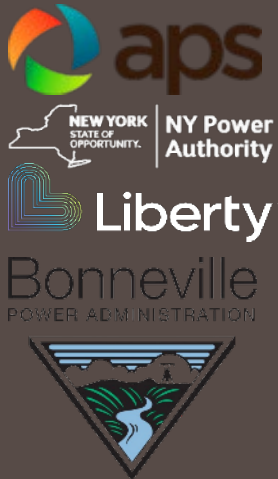
SMUD Is accredited as a “Right-Of-Way Steward” by the Right-Of-Way Stewardship Council for our approach to Vegetation Management -

- Initial accreditation received and maintained since 2015
 - Reaccredited in 2022, for 5 years
- **1 of only 9** utilities in North America to receive accreditation
- Rigorous and lengthy audit process to ensure only those with high standards in sustainability are accredited

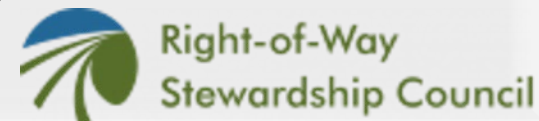


Benefits:

-  **Industry Accredited Reliability And Sustainability**
-  **Enhanced Community Relations**
-  **Assured Regulatory Compliance**




The [Right-of-Way Stewardship Council \(ROWSC\)](#), is an accreditation program that establishes very high standards for environmentally sustainable right-of-way vegetation management within a utilities right of way.



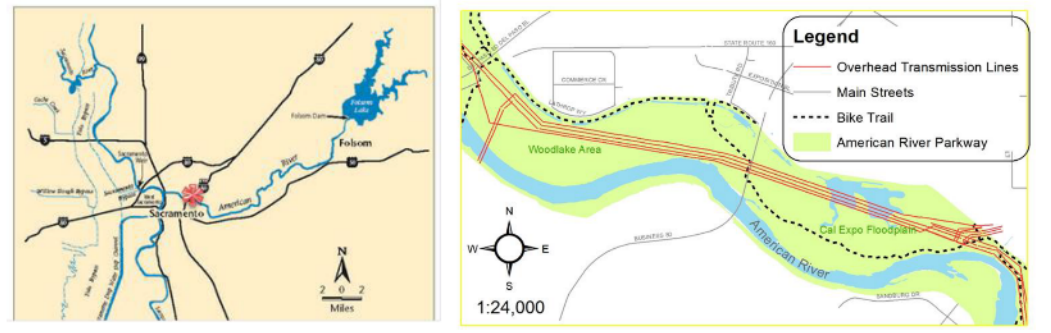
ROW Study's + Results

This project is supported by the following partners:



American River Parkway Foundation Pollinator Partnership Pacific Gas and Electric Company Sacramento Municipal Utility District Sacramento County Regional Parks SHARE

Project Location: Woodlake and Cal Expo Areas of American River Parkway in Sacramento County, CA



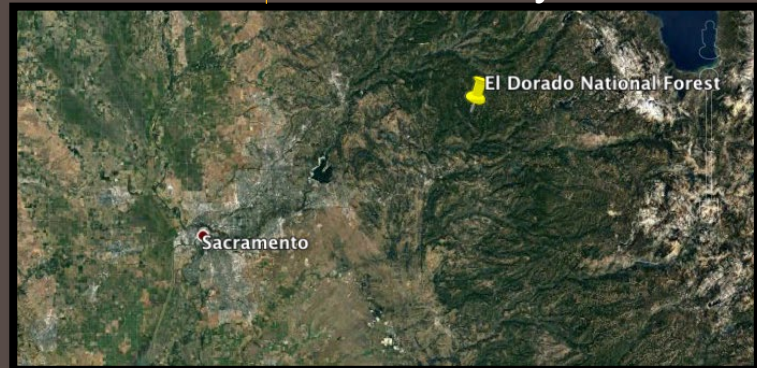
Legend:
— Overhead Transmission Lines
— Main Streets
- - - Bike Trail
■ American River Parkway

Scale: 1:24,000

Parkway Plot

- SMUD partnered with Sonoma State University in 2016 to begin expanding ROW studies within key areas on our electrical assets, this partnership continues today.
- SMUD also performed a similar one-time project for a sample site in the American River Parkway in 2016 shown on the left
- The Study of SMUDs VM work shows an occurrence of native pollinator species, both the richness (2X) and abundance (3X) being higher at IVM sites

UARP Study Location



Sonoma State University research continues at higher elevation sites

Community Collaboration and Tremendous Results

Johnny Cash Trail



BOR/State Park/City
Folsom/Folsom State Prison



Pine Hill Preserve (Critical habitat)



SMUD POLLINATOR GARDEN along Arcade-Cripple Creek Trail



* All flowering shrubs will be planted into deep woodchip, a dry farming method, and no supplemental irrigation system would be installed.

1 NATIVE FLOWERING SHRUB PLANTINGS IN OAK UNDERSTORY

Remove invasive vegetation and plant native pollinator friendly species. with wood chip method. Maintain existing oak trees that are below height restrictions.



2 UTILITY POLE COMMUNITY ART PROJECT (optional)

Paint utility pole within the oak understory planting area with large colorful native pollinators. Community members could be engaged by painting or design contest.



3 SEATING AREA

Uses re-purposed SMUD redwood logs as benches. Use decomposed granite for ADA accessibility. View from seating area frames native shrub oak understory and signage.



4 NATIVE FLOWERING SHRUB SLOPE PLANTING

Coir logs secured along contour to hold wood chips in place. Colorful flowering shrubs planted using wood chip mulch method.



★ SIGNAGE

Panel near seating area includes description of SMUD's collective group and closed loop process. Panel near slope describes the relationship between native pollinators and plant species installed at the site.



BEFORE

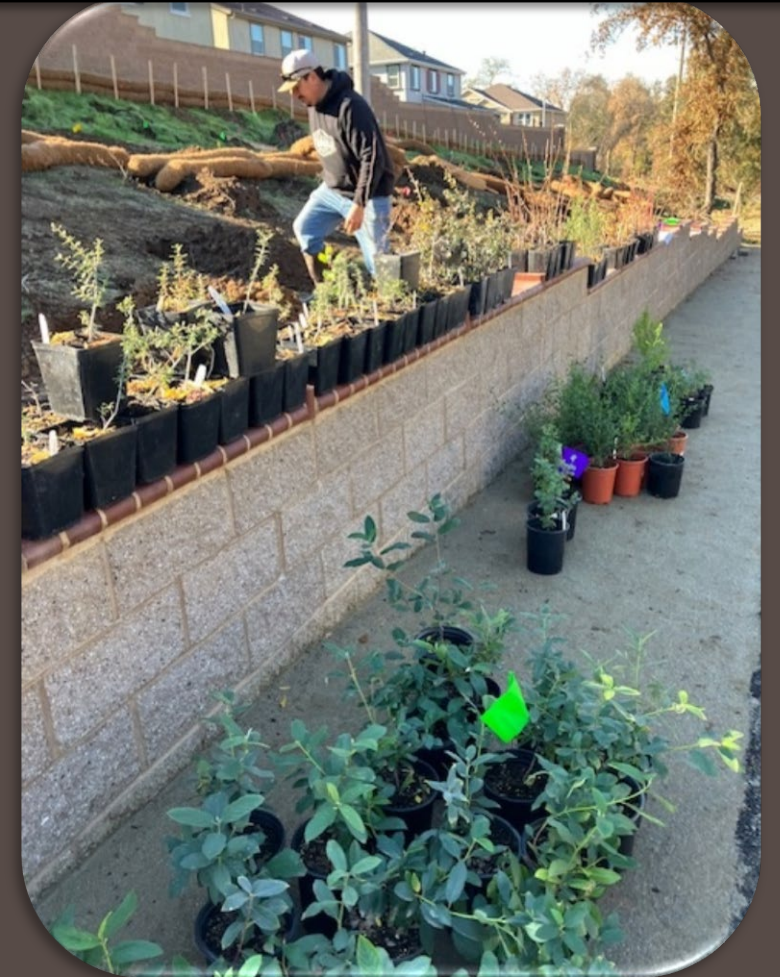


Donated plants - courtesy of



CALIFORNIA NATIVE
PLANT SOCIETY
Sacramento Valley Chapter

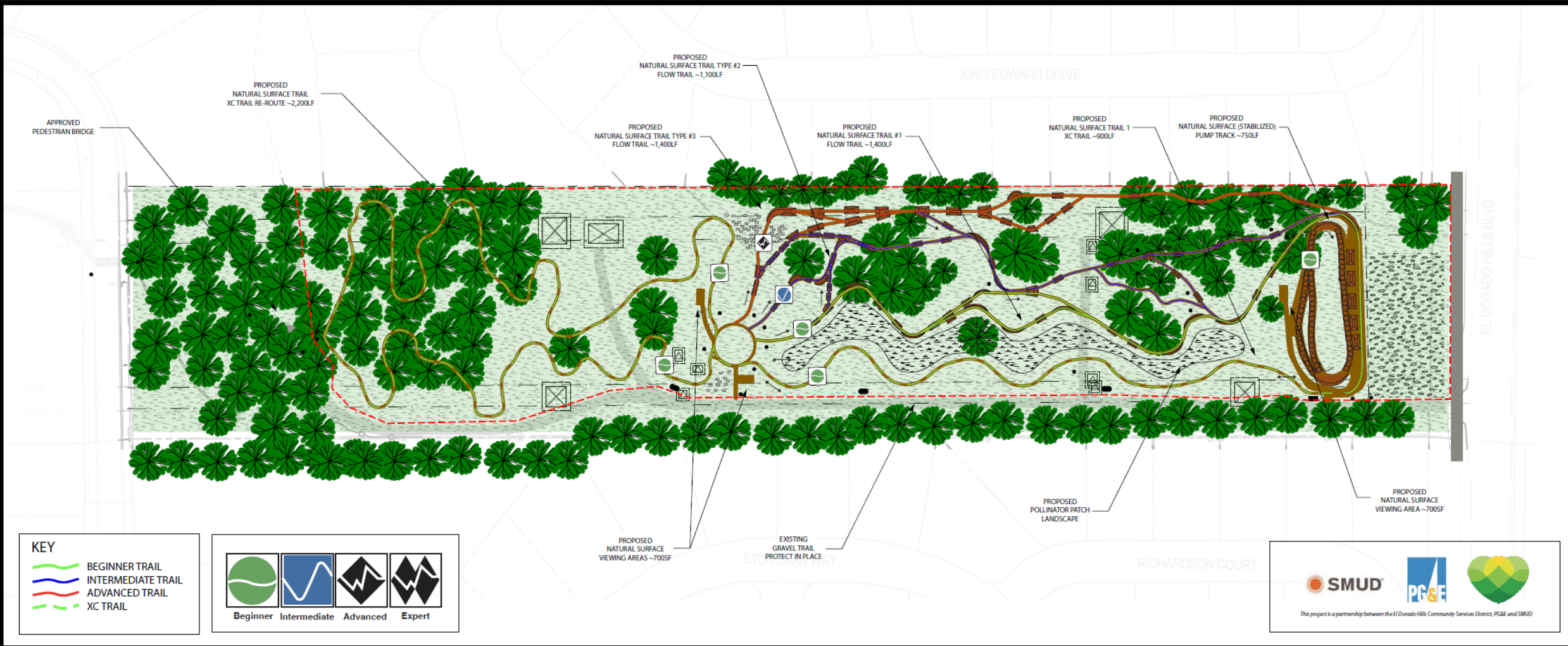
Home Growers for Social Justice



AFTER



El Dorado CSD Bike & Butterfly Park



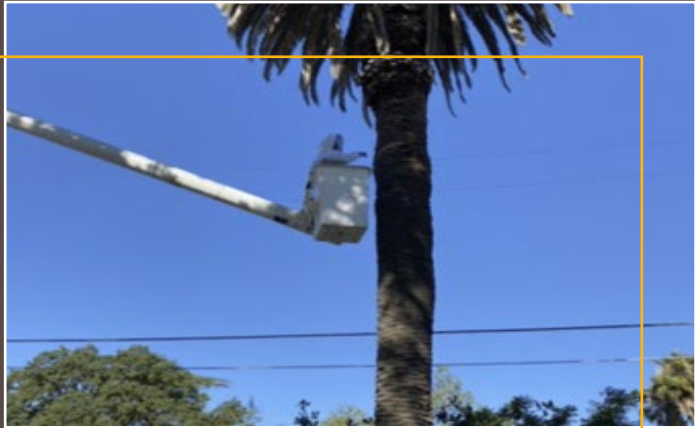
This project is a partnership between the El Dorado Hills Community Services District, PG&E and SMUD



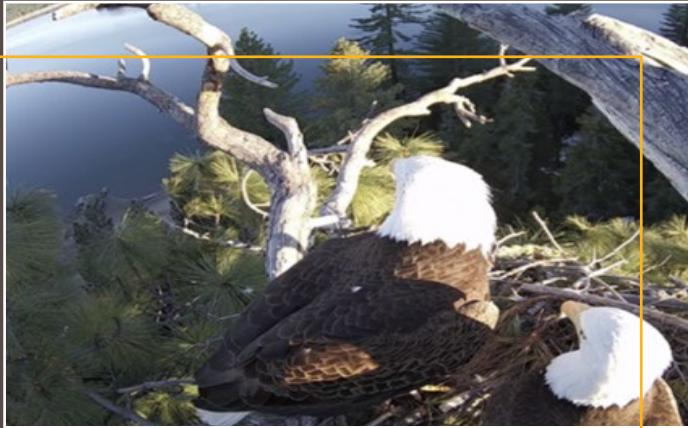


Union Valley 2023 El Dorado County
SMUD

Facilities & Environmental Services



Beehive Hosting & Relocation



Avian Protection Plan



Nature Preserve Mitigation Bank

- Employee training
- Providing alternative nest structures
- Installing perch deterrents
- Adding insulation on wires
- Installing markers to make power lines more visible to birds in flight
- Increasing space between electrical lines

Mitigation PLUS: HQ Native Tree & Hedgerow Plantings



**Project Proposal:
Carbon Farming and Pollinator
Habitat Creation in Utility-Scale
Solar at SMUD Rancho Seco
Solar II**



Large Scale Renewable Generation Projects

New requirements built into RFOs, land leases, PPAs



Projects are Evolving: Companion Objectives



Rancho Seco
Solar I



Rancho Seco
Solar II



Country Acres
Agrivoltaics +

Regulatory Compliance & Operational Capacity

SMUD Rancho Seco Restorative Energy Project

Reimagining Energy for Communities, Ecosystems, and Climate

4 year project concluding December 2025

Planned Study Topics:

Native plants, pollinators, amphibians, soil carbon, tribal culture, drought, PV performance.



EPRI

SMUD

Wild ENERGY UC DAVIS

XERCES SOCIETY for Invertebrate Conservation

NOVA SOURCE POWER SERVICES

DESRI



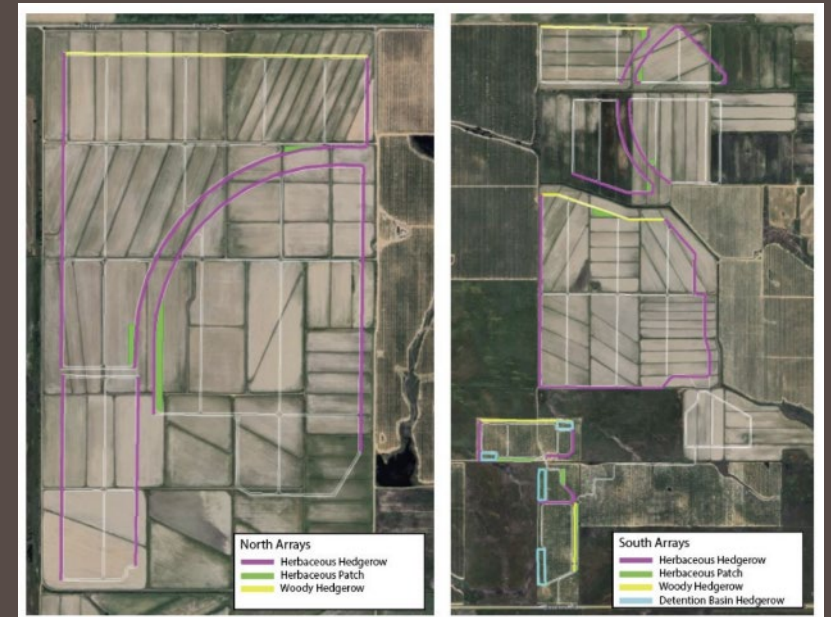
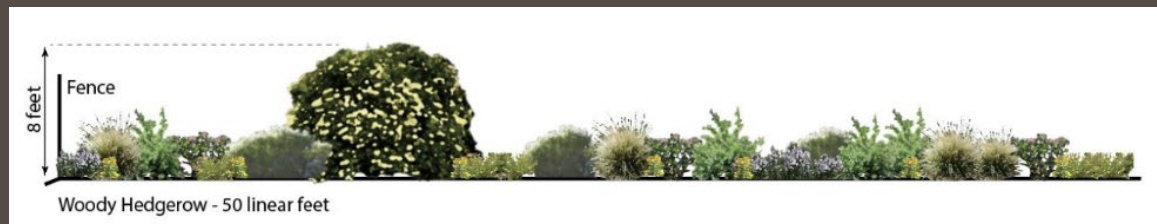
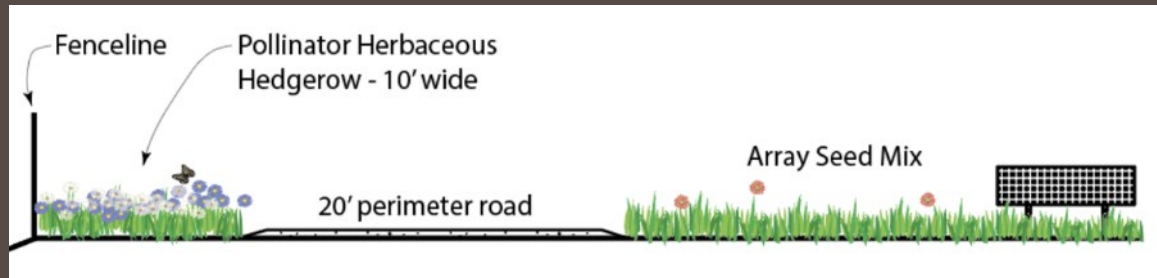
Rancho Seco with native Fiddleneck. Courtesy Jessica Fox, EPRI



Country Acres Agrivoltaics: “Harvesting the Sun Twice”



Preliminary Hedgerow Plans



Community Collaborations



Shading Sacramento

Improve air quality and cool your home

Overview of available shrubs from SMUD

Rhamnus californica/Frangula californica (Coffeeberry)



- Prefers full sun or partial shade
- Irrigate 2x/month once established
- Responds well to pruning
- Easy to propagate from seeds and cuttings
- Flowers bloom cream, green and white in the spring and summer
- Wildlife resistant
- Drought tolerant

Heteromeles arbutifolia (Toyon)



- Prefers full sun or partial shade
- Irrigate 2x/month once established
- Slightly fragrant
- Flowers bloom white in the summer
- Wildlife resistant
- Drought tolerant
- Attracts pollinators

Ceanothus 'Centennial' (Centennial Wild Lilac)



- Prefers shade, grows well under tree canopy
- Irrigate 2x/month once established
- Flowers bloom blue in the winter
- Heat and drought tolerant
- Attracts pollinators

Mahonia aquifolium (Dragon Grape)



- Prefers full sun, partial shade or full shade
- Irrigate 1x/month once established
- Prune in the dry season
- Has a pleasant fragrance
- Flowers bloom yellow in the winter and spring
- Wildlife resistant
- Drought tolerant

Arctostaphylos 'Emerald Carpet' (Emerald Carpet Manzanita)



- Prefers full sun or partial shade
- Water regularly until established, then 2x/month
- Flowers bloom white in the winter and spring
- Incorporating mulch around the plant helps to conserve water and suppress weeds
- Drought tolerant
- Attracts pollinators

Have room for trees? Learn more at smud.org/ShadeTrees.

Powering Forward, Together.



10,000 Native Plant Gardens.... Underway!



Let's grow
our community.



Xerces Central Valley Pollinator Mix

Planting instruction
Sow seeds in early to mid-fall or early spring in full sun or part shade. Rake soil surface to create grooves in the soil and scatter seeds by hand. Gently rake again or press seeds into the soil. Do not bury seeds. Water thoroughly and keep soil moist for 4–6 weeks. Gradually reduce watering. Learn more at smud.org/Pollinators.



Seeds grown at
Hedgerow Farms
hedgerowfarms.com

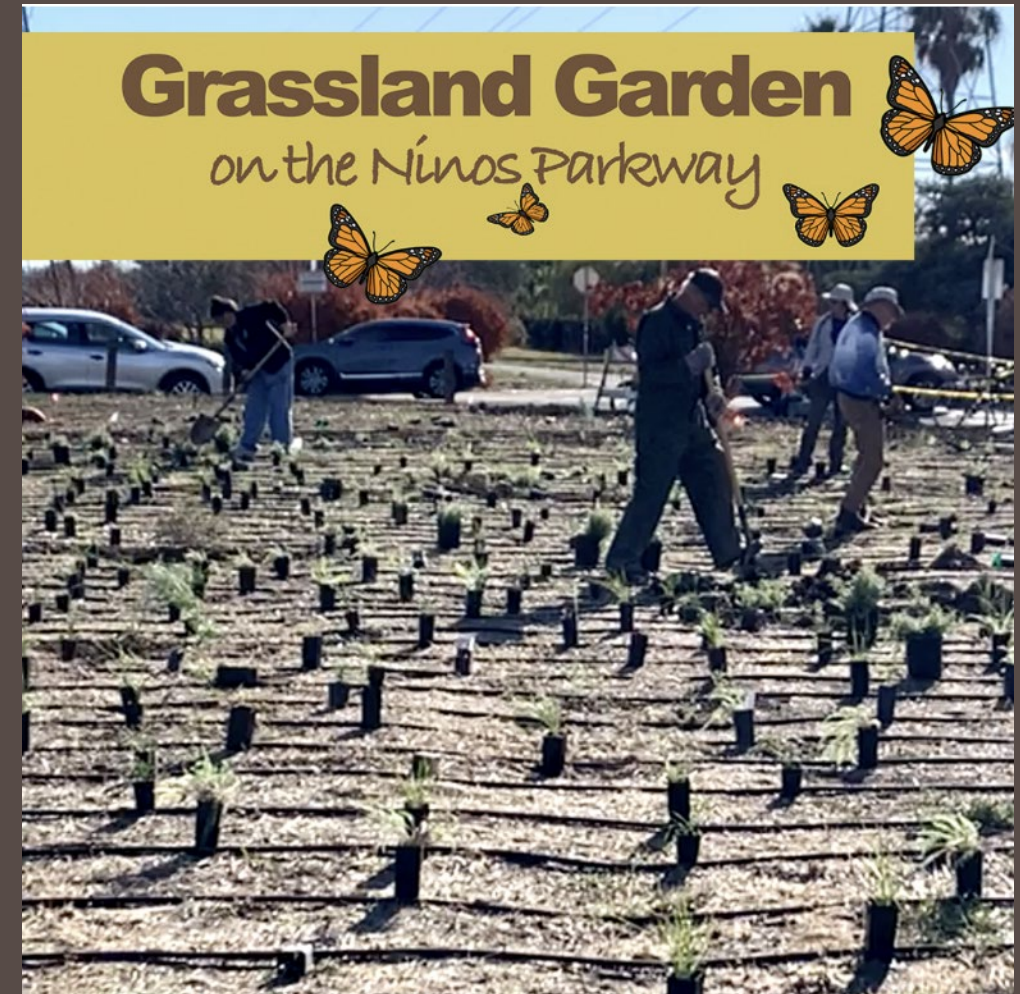
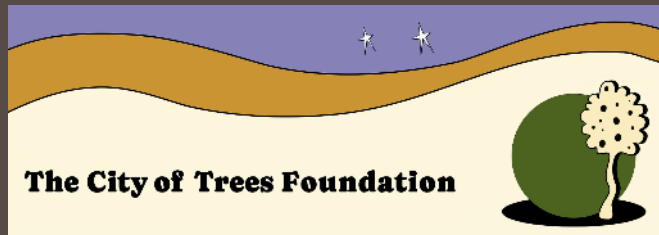
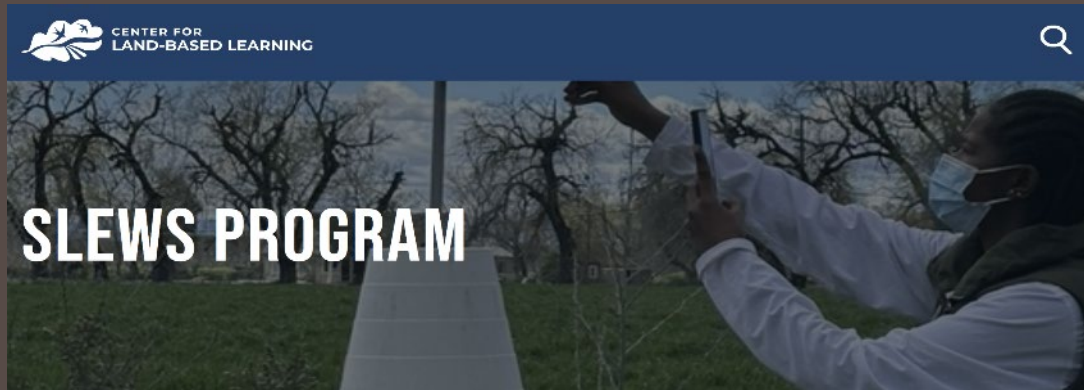


Packaged by Nature's
Seed naturesseed.com

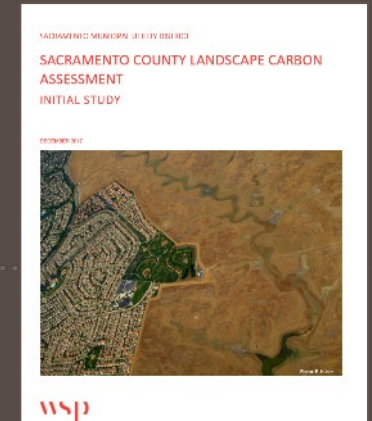
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SMUD SHINE supporting biodiversity & habitat



Opportunities: Carbon Farming to protect existing carbon stocks and expand carbon storage



Acres		3706	1800	409	2	7000	12917
2017 Carbon Density Factors - Static Storage	MT/acre	Full Transmission ROW	Nature Preserve Mitigation Bank	Rancho Seco Solar II (all zones)	Orangevale	Solar Roadmap (Projected)	TOTAL ESTIMATED TONS
Grassland	53	196418	95400	21677	80	371000	684575
Intermediate	96	355776	172800	39264	144	672000	1239984
Shrubland	134	496604	241200	54806	201	938000	1730811

Land Use and Land Cover	MTCO ₂ e/Acre
Agriculture: General	63
Agriculture: Orchard	63
Agriculture: Vineyard	36
Barren	7
Forest	170
Grassland	53
Shrubland	134
Urban/Developed	28
Water	0