SMUD

Nature-Based Carbon Solutions and Biodiversity Program Feasibility Study

November 19, 2025

GEI Consultants

Study Purpose and Objectives

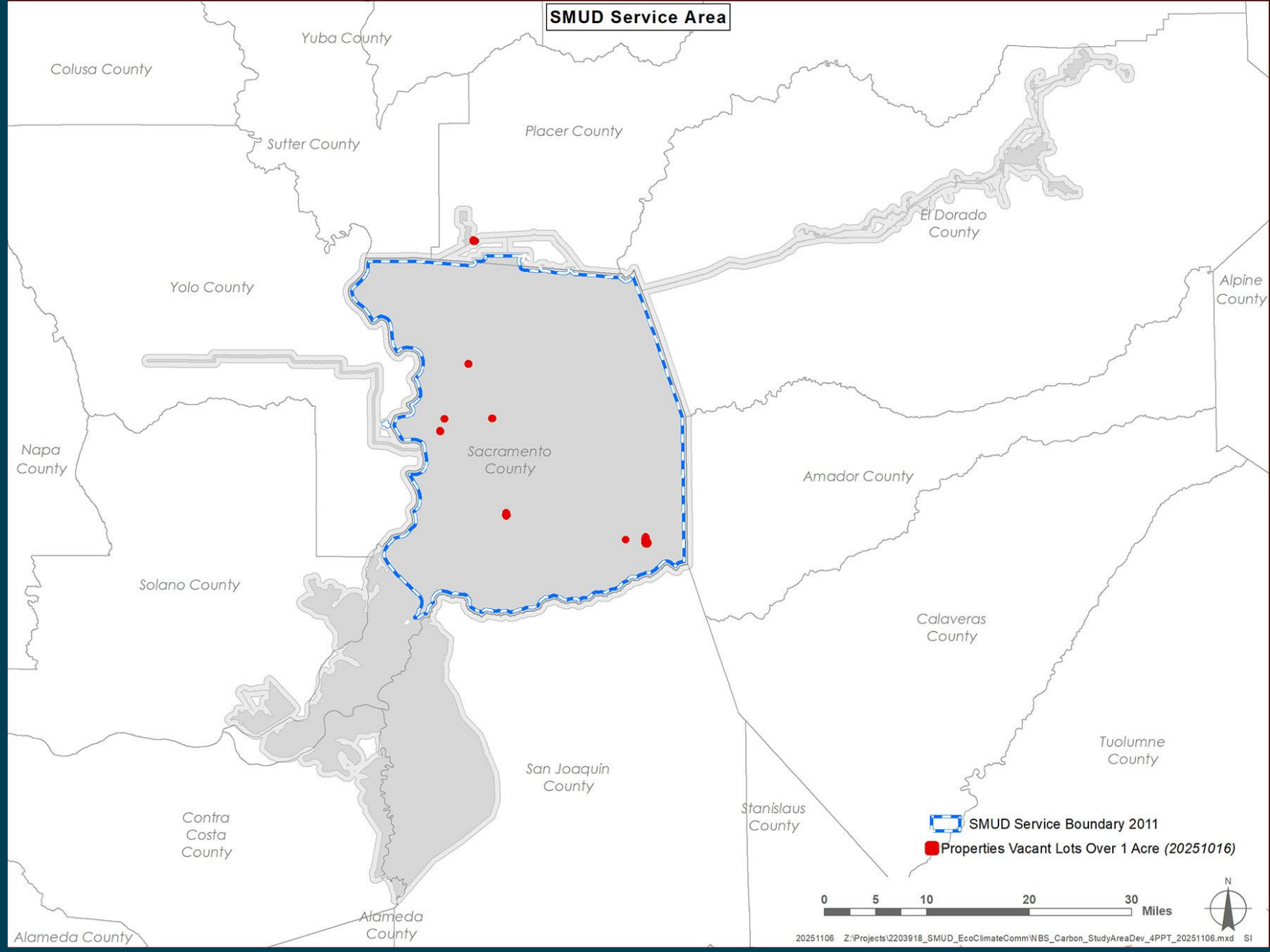
- Purpose
  - Create a plan for SMUD to support nature-based carbon storage
- Objectives
  - Identify opportunities for SMUD to support large-scale land-based carbon sequestration and/or preserve existing land-based carbon stocks
  - Evaluate potential co-benefits and constraints of opportunities
  - Develop a framework for implementation

Study Development

1. Map study area
2. Identify existing landcover and soils
3. Estimate existing land-based carbon storage
4. Identify land-based carbon sequestration practices and assess potential
5. Identify SMUD specific opportunities
6. Conduct assessment
7. Prepare Project Development Framework

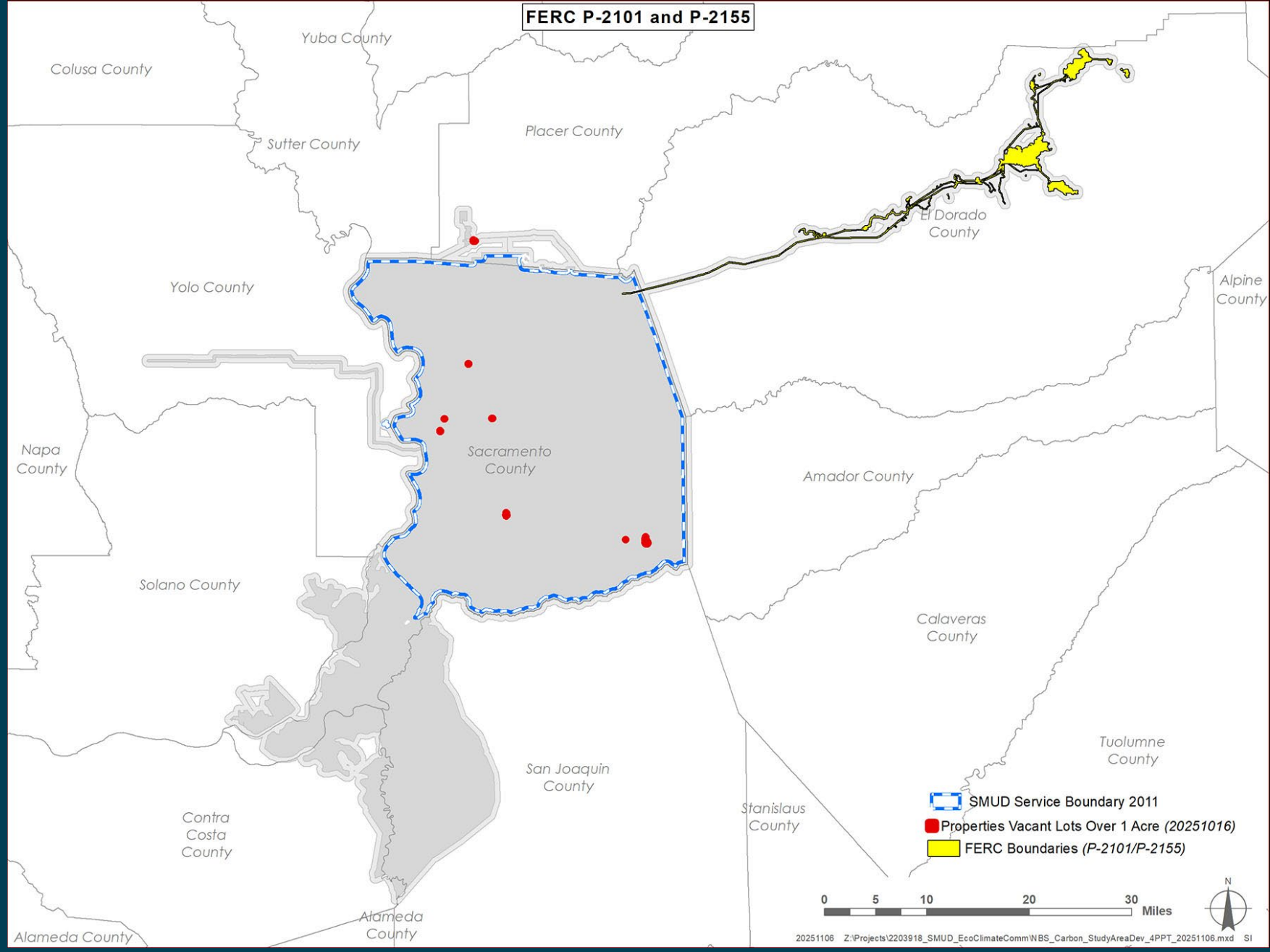
Study Area - 1

- SMUD Service Area
- SMUD owned undeveloped parcels over 1-acre



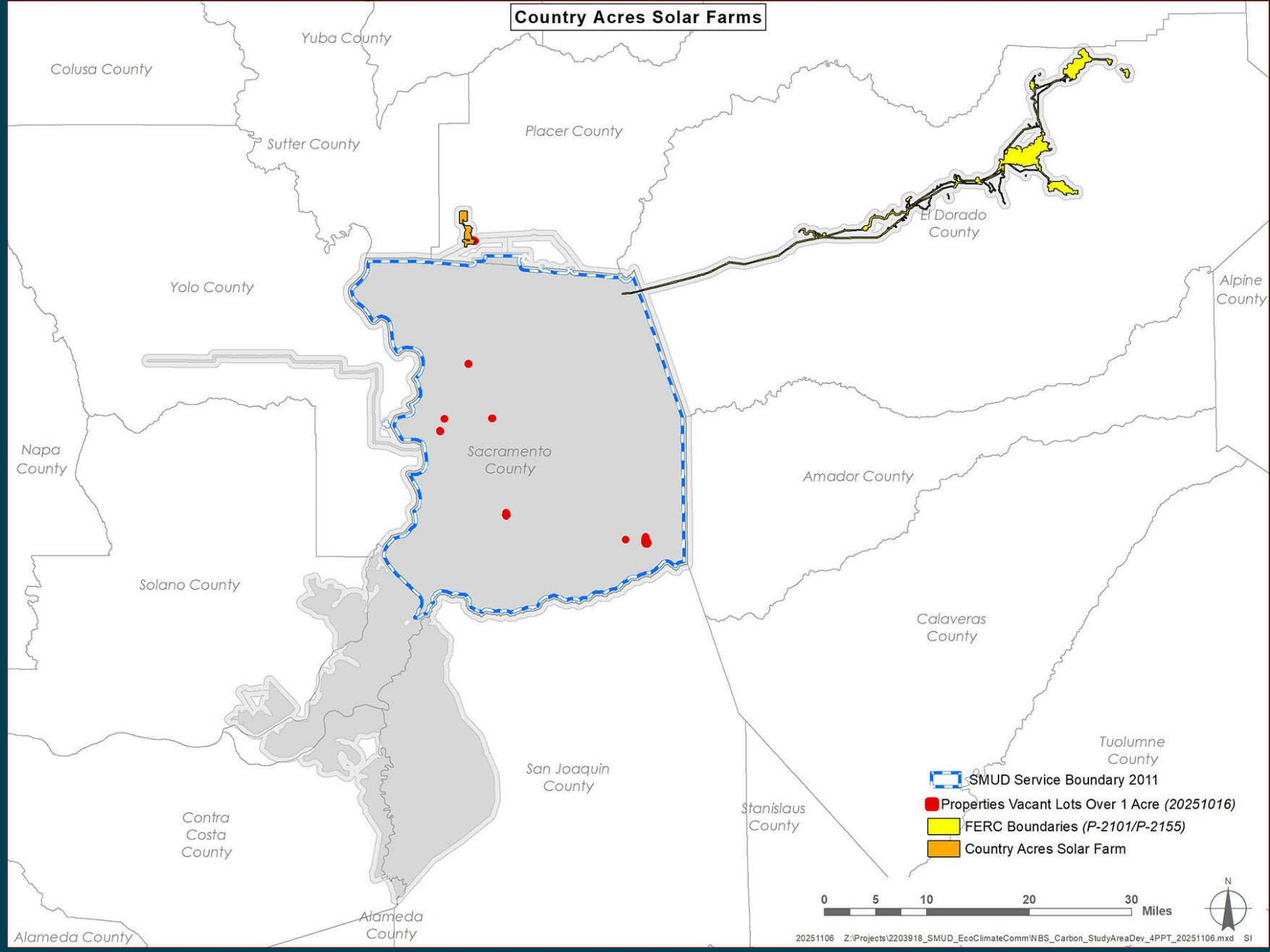
Study Area - 2

- SMUD Hydropower Project Areas and Transmission Corridors (El Dorado County)



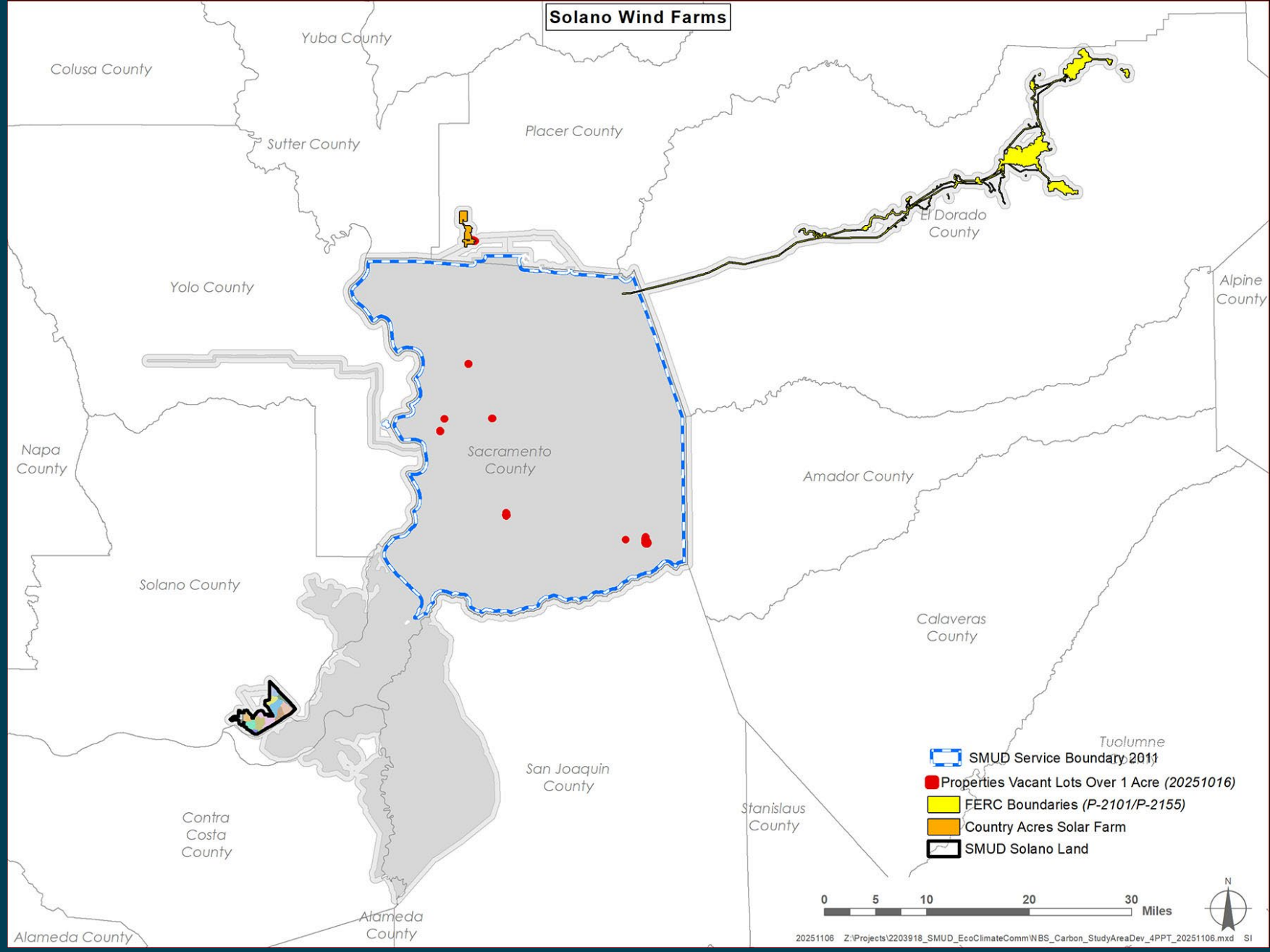
Study Area - 3

- Country Acres Solar Farms (Placer County)



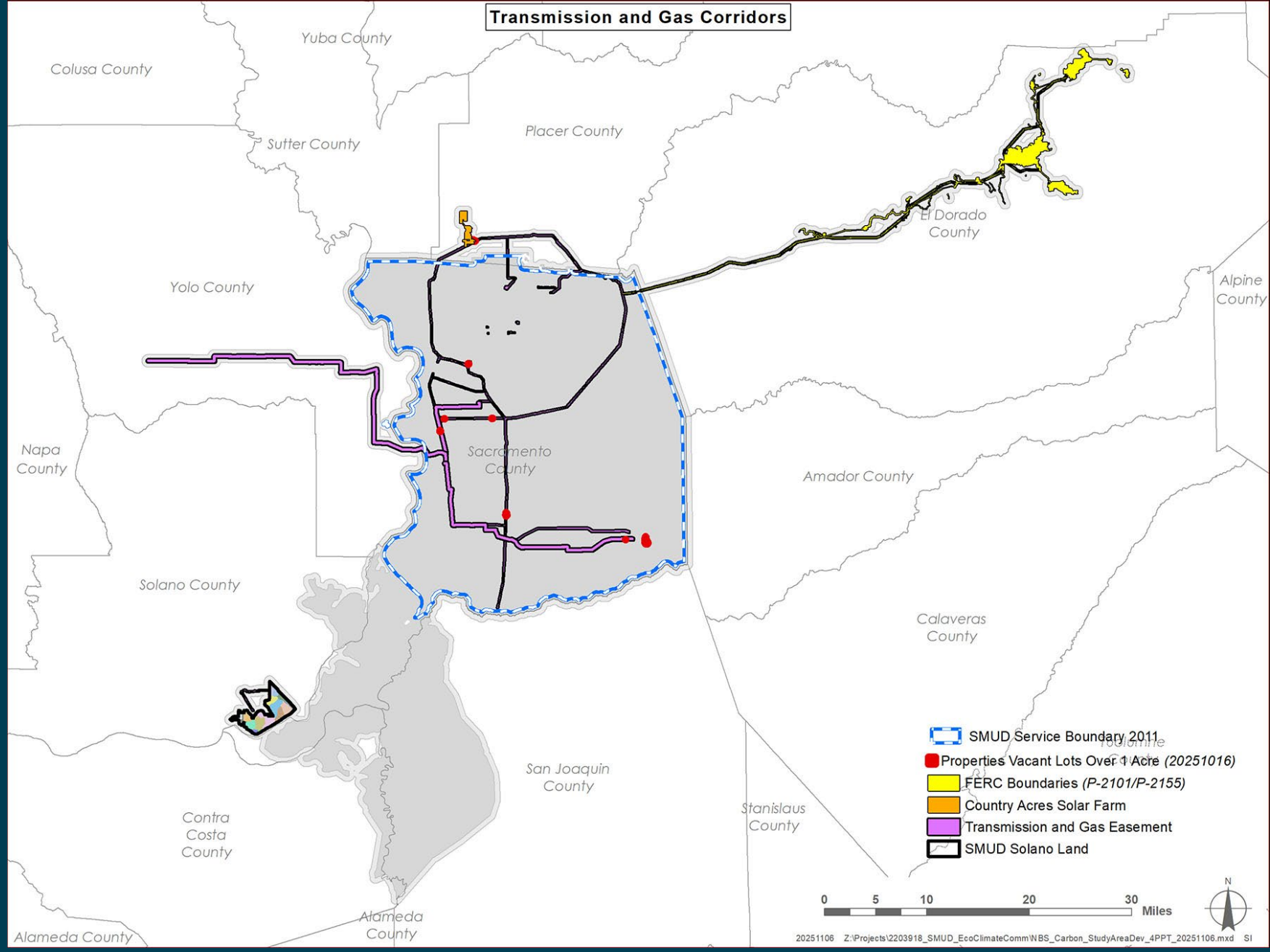
Study Area - 4

- Solano Wind Farms (Solano County)



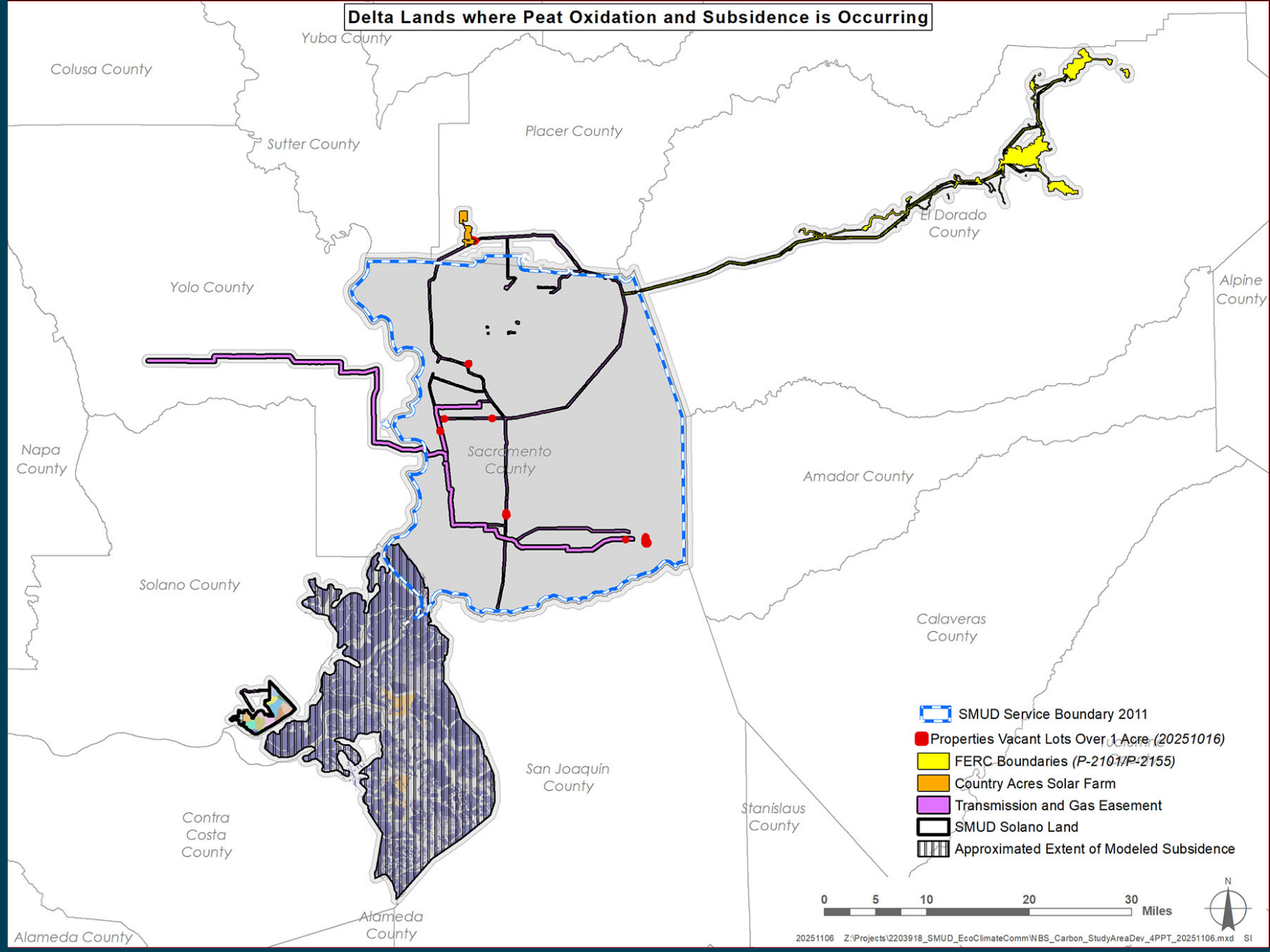
Study Area - 5

- Electric and Gas Transmissions Corridors
- Outside SMUD's Service Area (Yolo, Placer, and Solano Counties)



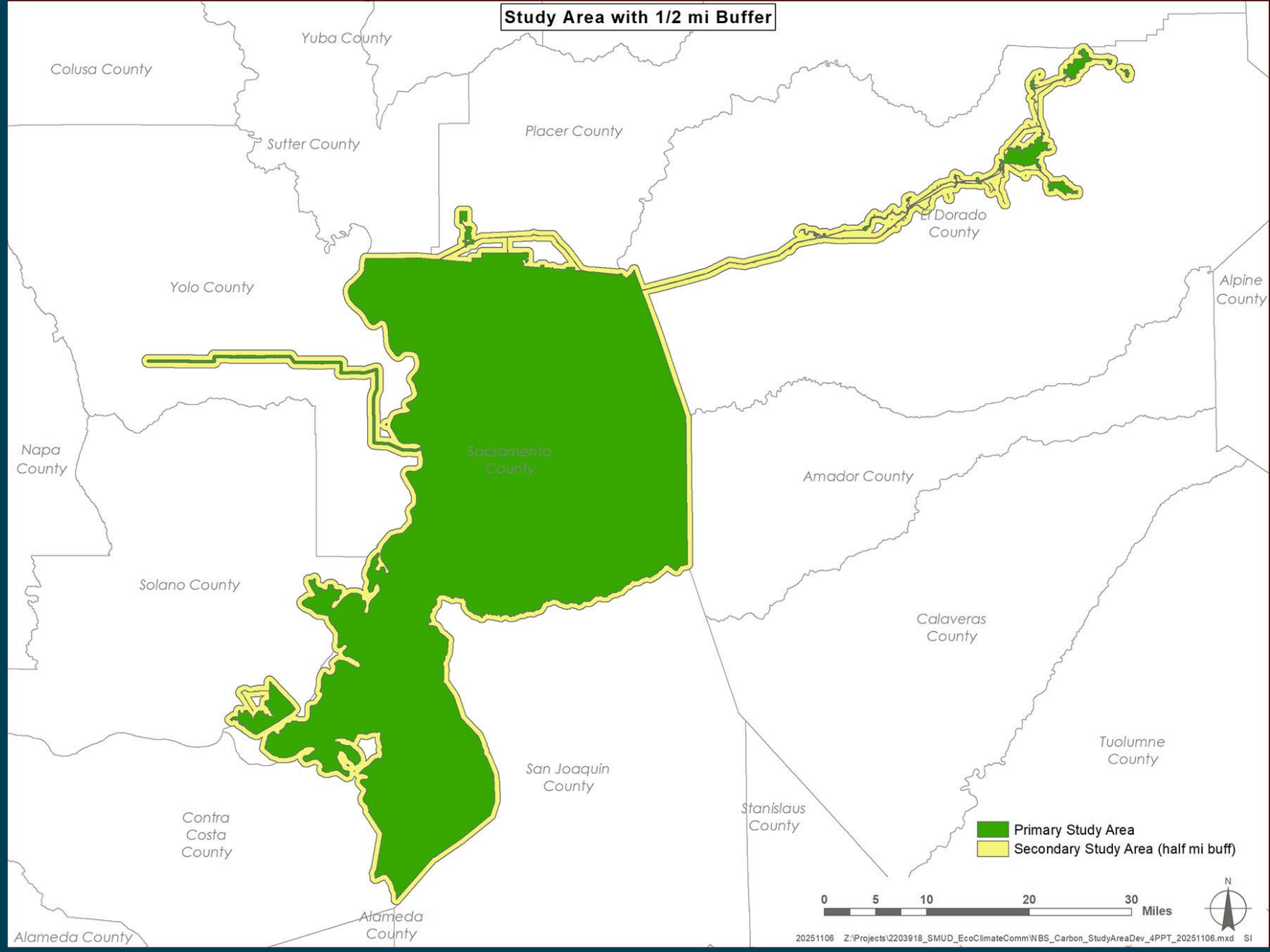
Study Area - 6

- Delta Lands where Peat Oxidation and Subsidence is Occurring (San Joaquin, Contra Costa, and Solano Counties)



Study Area - 7

- Complete Study Area (green)
- 0.5-mile Study Area Buffer (yellow)



Carbon Stock Inventory and Forecast Methods and Data

Methodology

- Perform GIS analysis of land cover, vegetation, and soil carbon
- Estimate baseline stock levels using carbon stock values from CARB and peer-reviewed literature
- Estimate change in carbon stocks under future climate change scenarios

Anticipated Spatial Data Sources

- CAL FIRE Fire and Resource Assessment Program (FRAP)
- SACOG’s Coordinated Rural Opportunities Plan (CROP) Map
- National Wetlands Inventory
- NRCS's Soil Survey Geographic Database (SSURGO)

Carbon Stock Forecast Using CARB Data

- Considered scenarios:
  - A Business-As-Usual scenario
  - A scenario where the 2022 Scoping plan is fully implemented
- Anticipates increased disruptions such as wildfires due to climate change
- 8.2 MMT C = 30,190,000 MT CO_2

Land-Based Carbon Sequestration Practices

- Identify practices based on land-cover and soil types
  - Agricultural/Croplands
  - Grasslands
  - Wetlands
  - Forests and Shrublands
  - Developed Lands
  - Others TBD
- Evaluate potential for increased carbon sequestration or preservation of existing carbon stocks
- Prepare high-level cost estimates
- Identify specific opportunities for SMUD within the study area

Land-Based Carbon Sequestration Practices

Example practices:

- Fuels management actions in forests to reduce risk of catastrophic wildfire
- Applying woodchip from vegetation management work to degraded soils
- Targeted grazing to promote soil carbon increases and biodiversity
- Rewetting peat soils in the Delta via rice farming or wetland restoration
- Urban tree planting programs
- Pollinator habitat/hedgerow plantings in urban areas including SMUD easements

Assessment

- Evaluate SMUD opportunities
  - Co-benefits: Biodiversity, protected lands, climate resilience, etc.
  - Constraints: Land ownership, regulatory considerations, etc.
- Selection and prioritization of SMUD opportunities
- Determine potential for SMUD to contribute to land-based carbon storage

Project Development Framework

- Provide guidance on how to select project sites using information in this study
- Discuss considerations for implementation of practices
- Identify needs for site-specific data collection during project planning
- Highlight important regulatory and stakeholder considerations
- Discuss need for long-term monitoring and reporting

Study Schedule

- **Develop Study Area** – Complete
- **Conduct Mapping and Develop Carbon Stock Inventory and Forecast** – Underway
- **Complete Feasibility Study** – Spring/Summer 2026