Napa Valley Subbasin
Groundwater Pumping Reduction Workplan Update and Recharge Feasibility Study

Napa County GSA TAG Meeting

December 11, 2025

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Overview

1. GSP **Management Actions 1 and 2**: WC and GPR Implementation
2. Extended Replant and Vineyard Removals
3. GSP **Project 1**: Managed Aquifer Recharge
4. Recharge Feasibility Study
5. Next Steps

GPR Workplan Implementation

Guiding Framework:

- Focus on voluntary actions that achieve groundwater benefits for the Subbasin
- Assess the costs and benefits of alternative actions and focus on those that are most cost-effective
- Leverage existing programs and opportunities to generate value from a suite of voluntary actions
- Include adaptive management to adjust the program as data and sustainability indicators evolve
- Mandatory measures if voluntary programs do not achieve measurable reductions in groundwater pumping (e.g., mandatory metering/reporting)

Groundwater Pumping Reduction **10%**

Groundwater Replenishment/ Other GSP Projects

Program Components & Voluntary Actions

(Individual Choice to Participate in Some or All)

GSA & Stakeholders	MA1: Water Conservation MA2: GW Pumping Reduction	P1: Aquifer Recharge	P2: Expand Recycled Water Use
Education & Outreach	Urban & Rural Conservation	Soil Health/ Cover Crops	Landscape Irrigation
Local Certification Partnerships	Best Management Practices (e.g., irrigation efficiency)	Best Management Practices (e.g., increase infiltration)	Best Management Practices (e.g., onsite treatment & resuse)
Conservation Incentives	Apply Technologies	Retain On-farm Stormwater	Vineyard Irrigation
Water Use Data; Benchmarking	Water Use Tracking	Capture/Reuse Tile Drain Stormwater	Dry Farm Supplemental Water Source
Agriculture Innovations & Influencers	Conservation Initiatives	Stormwater Storage/ In Lieu Use	Recycled Water Storage/ In Lieu Use
Conservation Nudging	Extended Time to Vineyard Replanting	Winter Recharge	Fallow Acreage Recharge

Sustainability Goal Achieved through Collective Community Actions?

YES — **Local Control**
Continue Voluntary Efforts

NO — **State Control**
Mandatory Measures

EXTENDED VINEYARD REPLANT CONCEPT
2025 VINEYARD REMOVALS

Extended Vineyard Replant Program Concept

Program Concept Overview

- Voluntary program with incentive offered to increase duration of idle/fallow between removal and replanting
  - Water savings as replants are shifted
- Explore in combination with other practices to increase benefits (Recharge Scenario 1)
- Considerations
  - ISW and GDE
  - Market conditions
  - "Mothballing" is a similar potential concept

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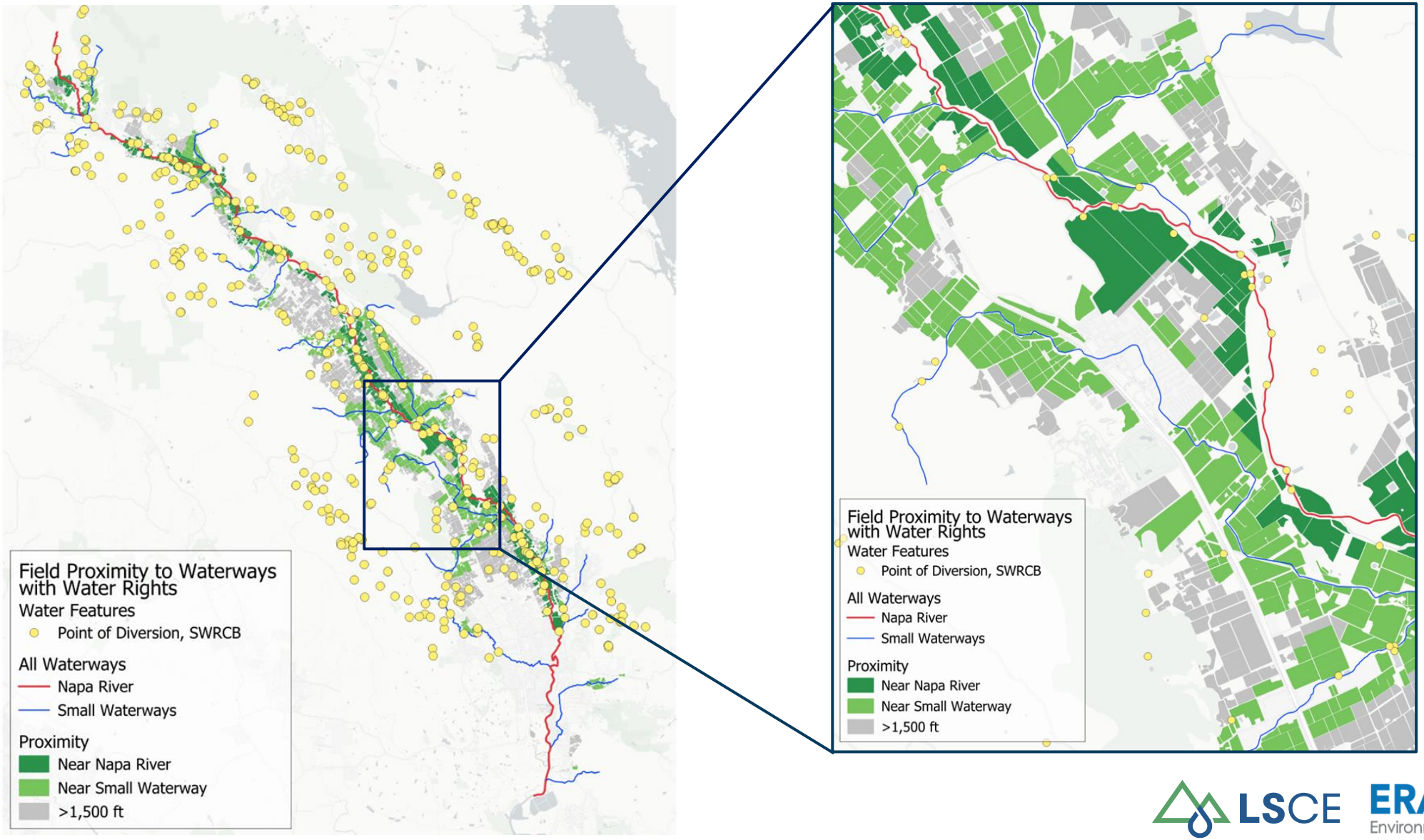
Extended Replant Lands Analysis: Overview



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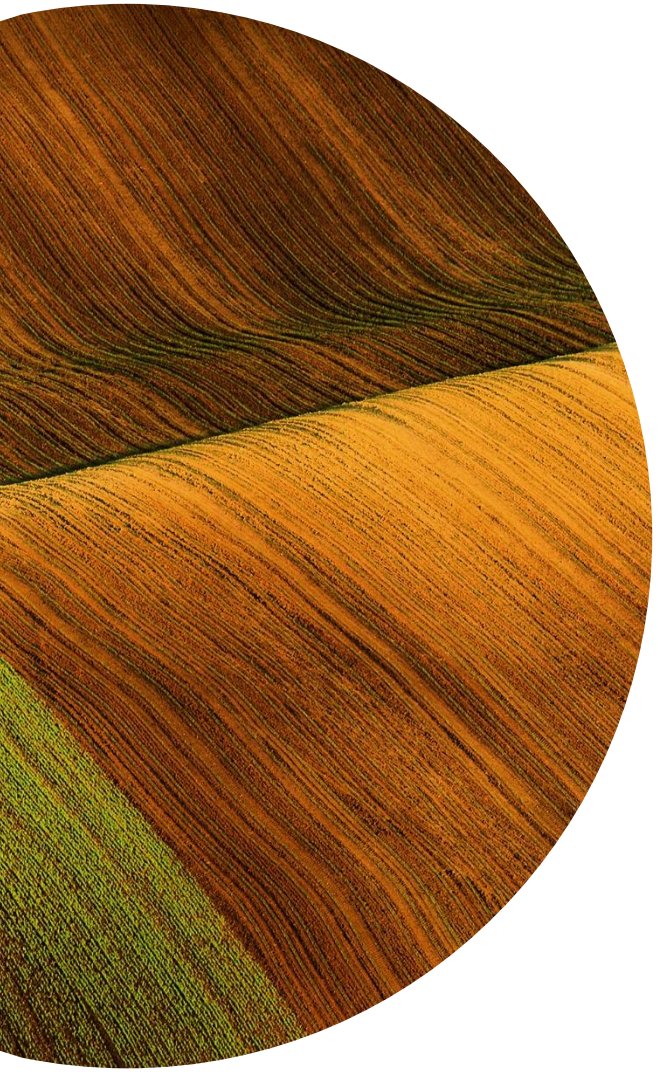
2025 Vineyard Removals



Overview

- Wine market conditions
- How are growers adapting?
  - Maintain, replant, removal, switch crops, mothball, abandon, or sell
- Evaluate replants and removals in 2025
  - Assessor data, ET evaluation, NDVI, satellite imagery visual analysis

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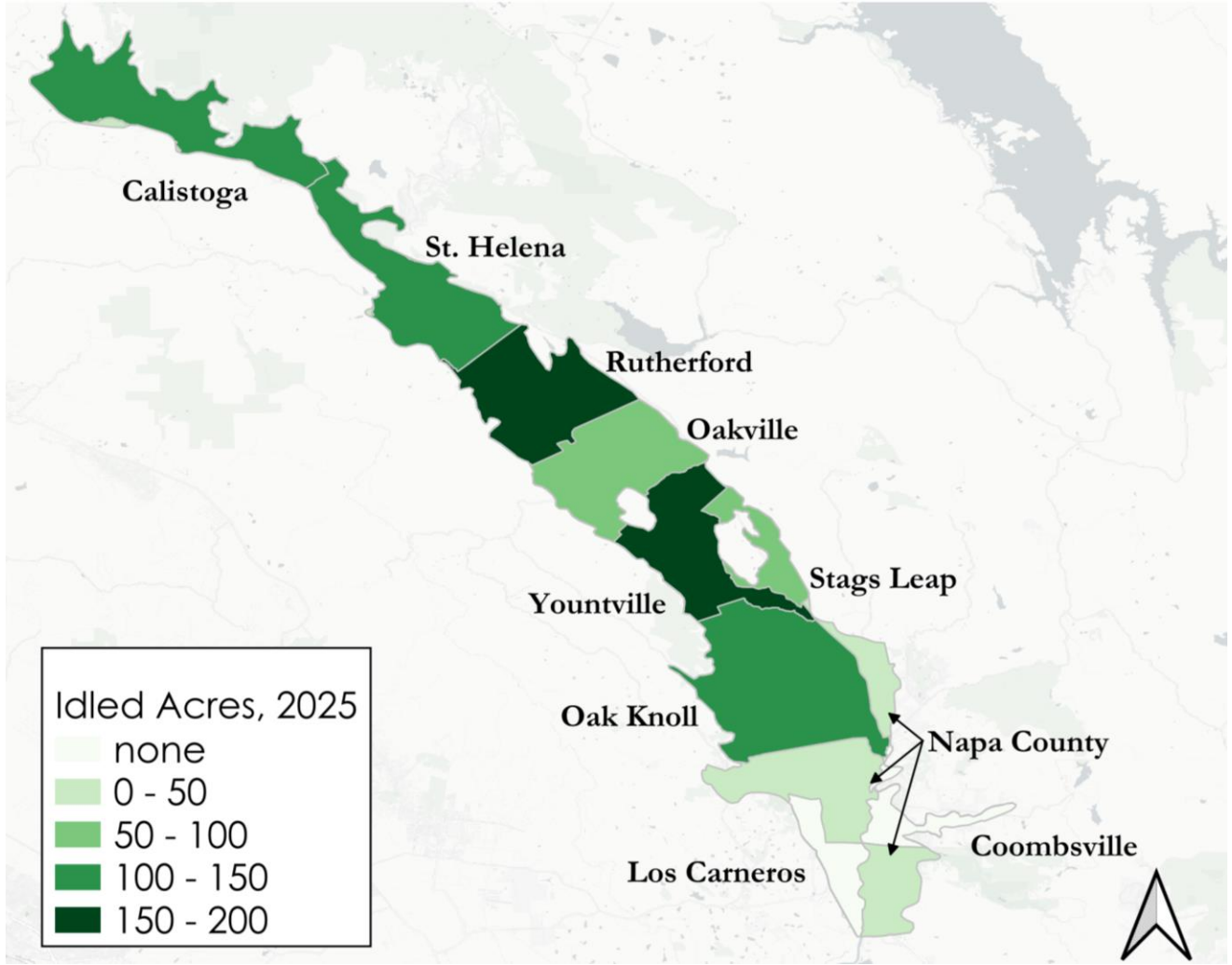
2025 Vineyard Removals



Preliminary Estimates

- 101 fields totaling 912 acres within the Subbasin (in full or part) in 2025
- Does not include replants in 2023 and 2024 that are still idle
- Replants as of September on 13 fields and 72 acres

GSP PROJECT #1: MANAGED AQUIFER RECHARGE

Recharge Investigation

Study Overview

- Increase groundwater recharge
  - Target SGMA benefits (e.g., ISW and GDE)
  - Application of BMPs (e.g., stormwater retention)
  - Link to other GPR programs (extending replant, certification, other water conservation practices)
- Assessment of recharge opportunities
  - Technical (water supply, land use, infrastructure needs)
  - Economic (costs, benefits, return on investment, comparison to other PMAs)
  - Financial (funding mechanism)

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Working Draft TOC

1. Overview
2. Recharge Opportunities
   - Recharge Scenarios (Four Scenarios)
3. Technical and Legal
   - Water Rights for Recharge
   - Existing Water Right Utilization in Subbasin
   - Obtaining New Water Right
   - On-Farm Infrastructure and Management Considerations
   - GSP and Effects on ISW/GDE and Other SMC
   - Environmental
4. Economic Feasibility
   - Capital and O&MR Costs
   - Economic Benefits and Benefit-Cost Assessment
5. Financial Feasibility
   - Cost Recovery and Funding Strategy
   - Recharge Crediting Concept
6. Summary
7. References

Recharge Feasibility Study

Preliminary Activities: Feasibility Study

- Analysis underway across multiple components, including economic, technical, and financial
- Ongoing grower discussions for existing activities, feasibility, infrastructure, costs, existing experience and knowledge
- Launching modeling and analyses

Recharge Scenarios

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Name	Extended Replant Recharge	Direct On-Farm Recharge	Pumping Reduction Recharge	Multibenefit Recharge
Description	Increase recharge on idle vineyard	On-farm recharge that may include Ag-MAR or basins	Use existing pond or reservoir for storage to reduce pumping	Recharge on lands near significant streams
Duration	< 5 years	Longer	Annual	Longer/permanent
Capital	Limited to standard replanting work, light earthwork/berms	Flood-MAR or recharge basins	Limited	Earthwork and infrastructure
Water Right Pathway	Temporary underground storage	Temporary underground storage	Existing rights	Temporary underground storage
Administration	GSA or individuals	GSA	Individuals	GSA

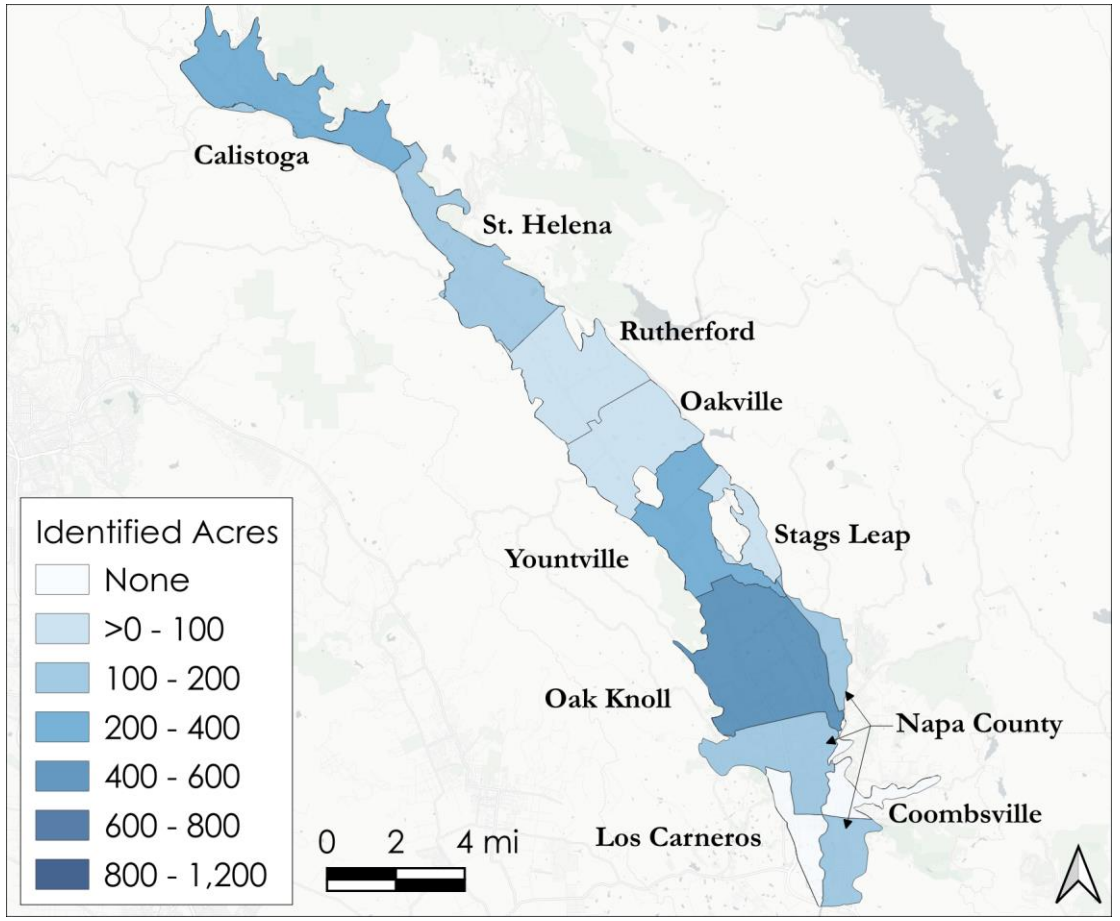
Scenario 1

Extended Vineyard Replant

Preliminary Spatial Screening

- Has at least one field on the parcel that is
  - Older than 25 years old
- Has **POD** on parcel

APNs	Vineyard Acres	PODs
55	1,556	66



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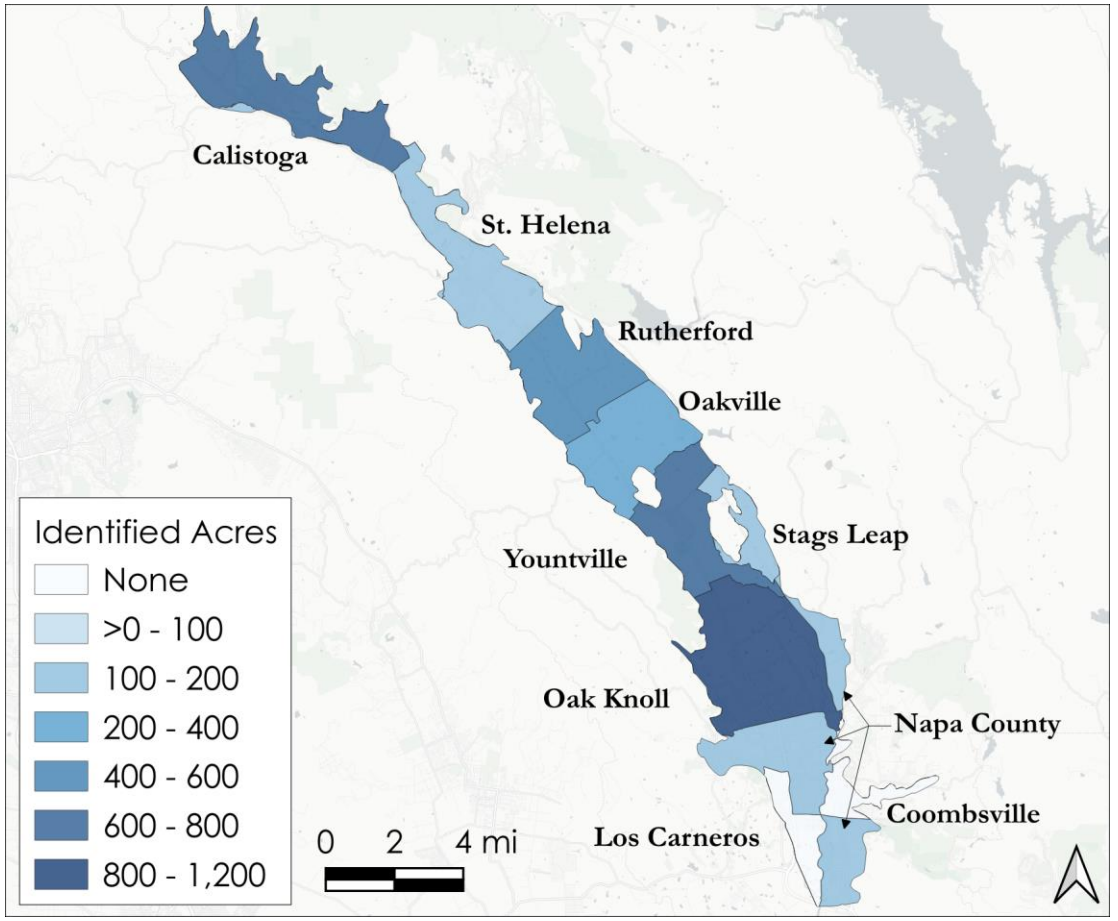
Scenario 2

Direct On-Farm Recharge

Preliminary Spatial Screening

- Has **POD** on parcel

APNs	Vineyard Acres	PODs
106	3,665	138



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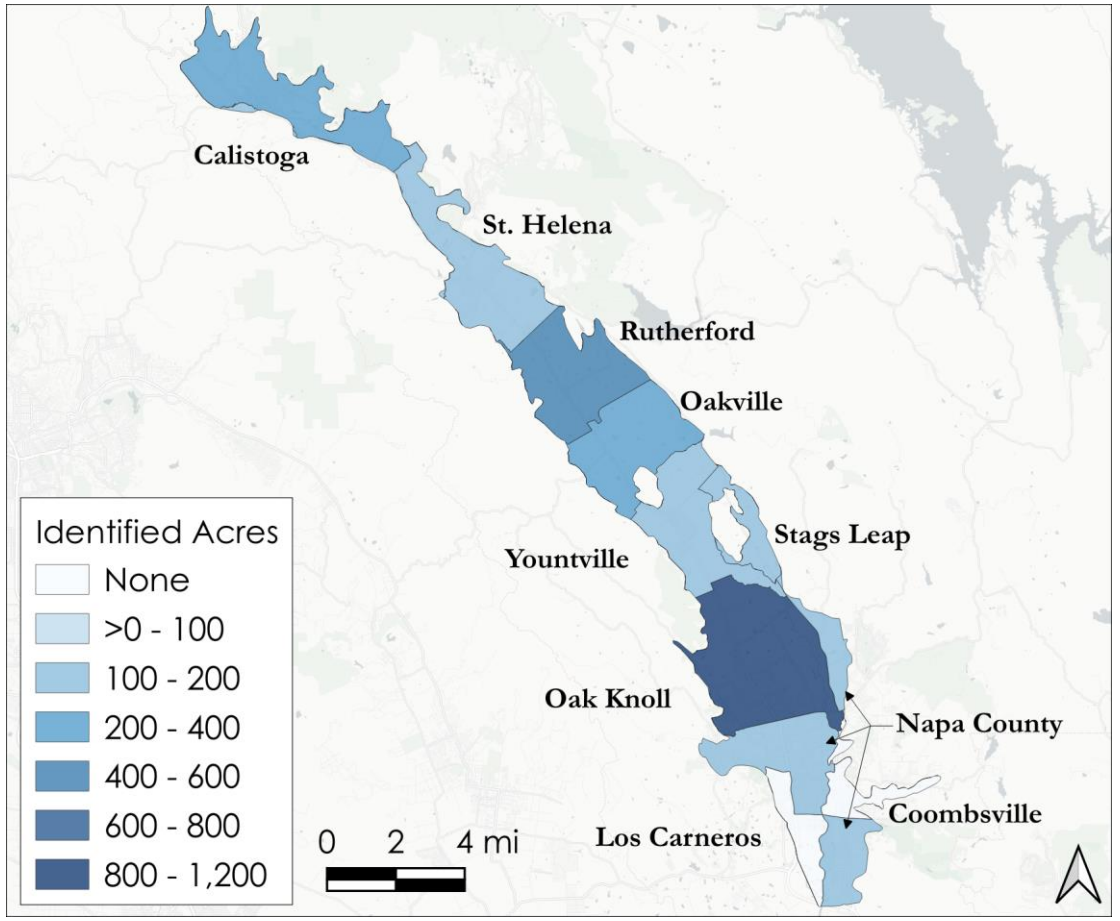
Scenario 3

Pumping Reduction

Preliminary Spatial Screening

- Has **POD** on parcel *and*
- Has **pond or reservoir** on parcel

APNs	Vineyard Acres	PODs	Ponds
66	2,322	87	75



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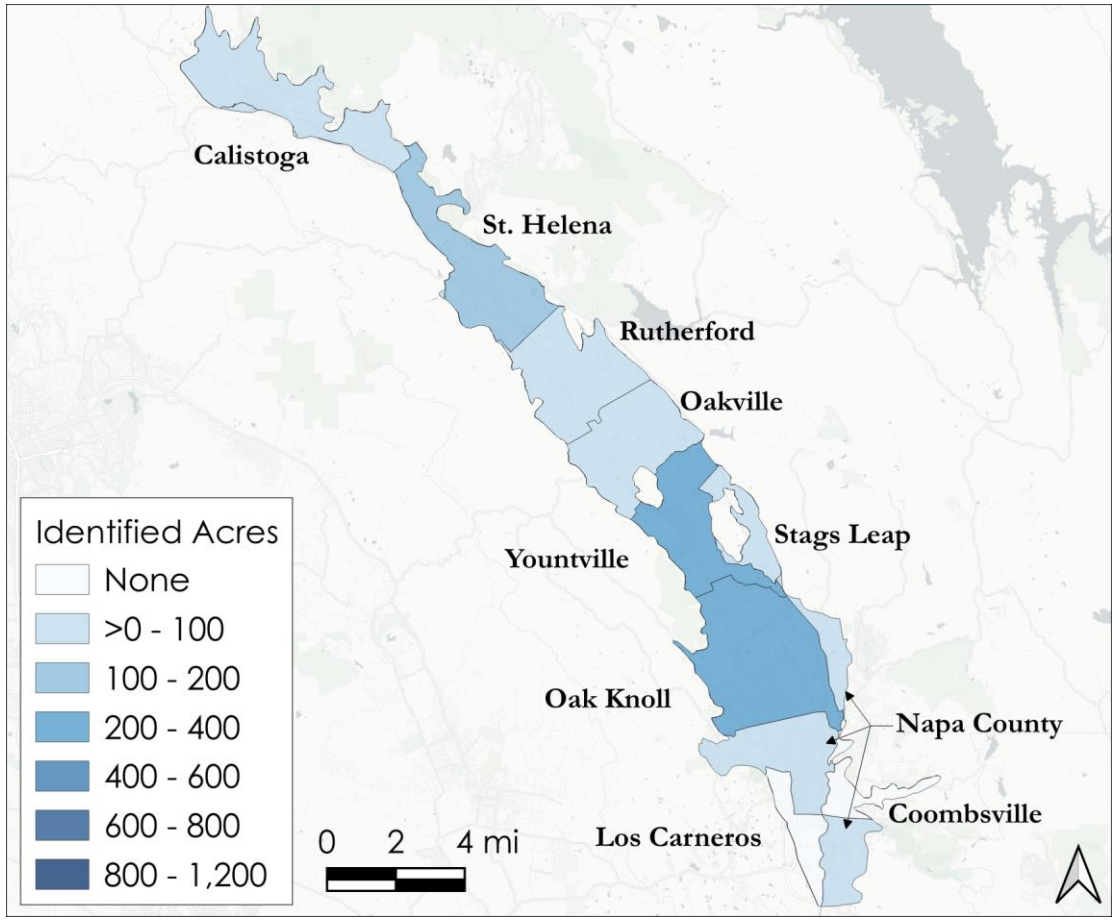
Scenario 4

Recharge Basins &/or Multipurpose

Preliminary Spatial Screening

- Has at least one **field** on the parcel that is
  - Within 1,500 feet of a significant stream
  - Older than 25 years old
- Has **POD** on parcel

APNs	Vineyard Acres	PODs
34	1,041	43



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RECHARGE FEASIBILITY STUDY: WATER RIGHTS CONSIDERATIONS AND MODEL SCENARIO DEVELOPMENT

Water Rights Considerations

- Existing water rights cannot be augmented to include **new** use
- Managed Aquifer Recharge falls under "**temporary underground storage**" for a later beneficial use – **new water right**
- Pumping reduction falls under a "**direct diversion**" water right for irrigation – **existing water right**
- The type of water right determines the pathway for securing a permit to divert under the State Water Resources Control Board

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Direct Diversion for Irrigation – Landowners (Pumping Reduction)

- Securing new or augmented water right for direct diversion for irrigation is **difficult, expensive and time-consuming**.

  – These water rights are currently held by **individual landowners**

- Most feasible pathway is to identify and leverage **underutilized** existing water rights to increase temporary surface storage for irrigation "in-lieu" of groundwater pumping
- Change how existing water rights are utilized to optimize groundwater conditions and low-flows

Temporary Underground Storage - GSA (Managed Aquifer Recharge)

- Securing new (temporary) permit for underground storage can be easy through streamlined processing
- Water right is for **temporary underground storage**
- Beneficial use can be existing pumping[1] for irrigation, domestic, municipal or increase in summer/fall instream flows
- Water rights held by the GSA (county) and administered through landowner partnerships using existing points of diversion
- Need to demonstrate water availability and subject to North Coast Instream Flow Policy (2014)

1. Other PMAs still target a total reduction in pumping to achieve sustainability goal

Scenario 1, 2 & 4

Modeling Managed Aquifer Recharge

Existing Modeling

- Existing NVIHM can be leveraged to estimate water availability – we have modeled estimate of flow in every significant stream

Preliminary Modeling

- Test feasibility – recharge rates, water table impacts on vineyards, preliminary assessment of locations and potential volumes
- Evaluate benefits on SMCs and low flows

Water Rights Application Support

- Demonstrate beneficial use (e.g. in-stream benefits, groundwater pumping) and support water accounting plan (required in water rights application)

Scenario 3

Modeling Pumping Reductions

Existing Modeling

- Existing NVIHM model is currently being utilized by SWRCB in their decision-making support model to better simulate flows to evaluate water rights
- Existing NVIHM can be leveraged to estimate water availability – determine when and where is there "excess" flow

Preliminary Modeling

- Model can be used to simulate the net increase in diversion and on-farm storage
- Model can be used to simulate different diversion and use scenarios of existing water rights (timing and amount) to increase low-flows
- Evaluate the reduction in calculated groundwater pumping and quantify benefits to SMCs and low-flows

Discussion

Different data sources and information are being used to develop these projects and analyses.

- ***Do you have any questions, insights, or considerations to improve and refine the development of this work?***

Next Steps

Recharge Investigation

- Evaluate water rights
- Preliminary modeling
- Pursue partnerships