



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

Napa County GSA TAG Meeting
December 11, 2025

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



Education
& Outreach



Local Certification
Partnerships



Conservation
Incentives



Water Use Data;
Benchmarking



Agriculture Innovations
& Influencers



Conservation
Nudging

MA1: Water Conservation MA2: GW Pumping Reduction

Urban & Rural
Conservation



Best Management Practices
(e.g., irrigation efficiency)



Apply
Technologies



Water Use
Tracking



Conservation
Initiatives



Extended Time to
Vineyard Replanting



P1: Aquifer Recharge

Soil Health/
Cover Crops



Best Management Practices
(e.g., increase infiltration)



Retain On-farm
Stormwater



Capture/Reuse
Tile Drain Stormwater



Stormwater Storage/
In Lieu Use



Winter
Recharge



P2: Expand Recycled Water Use

Landscape
Irrigation



Best Management Practices
(e.g., onsite treatment & reuse)



Vineyard
Irrigation



Dry Farm Supplemental
Water Source



Recycled Water Storage/
In Lieu Use



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

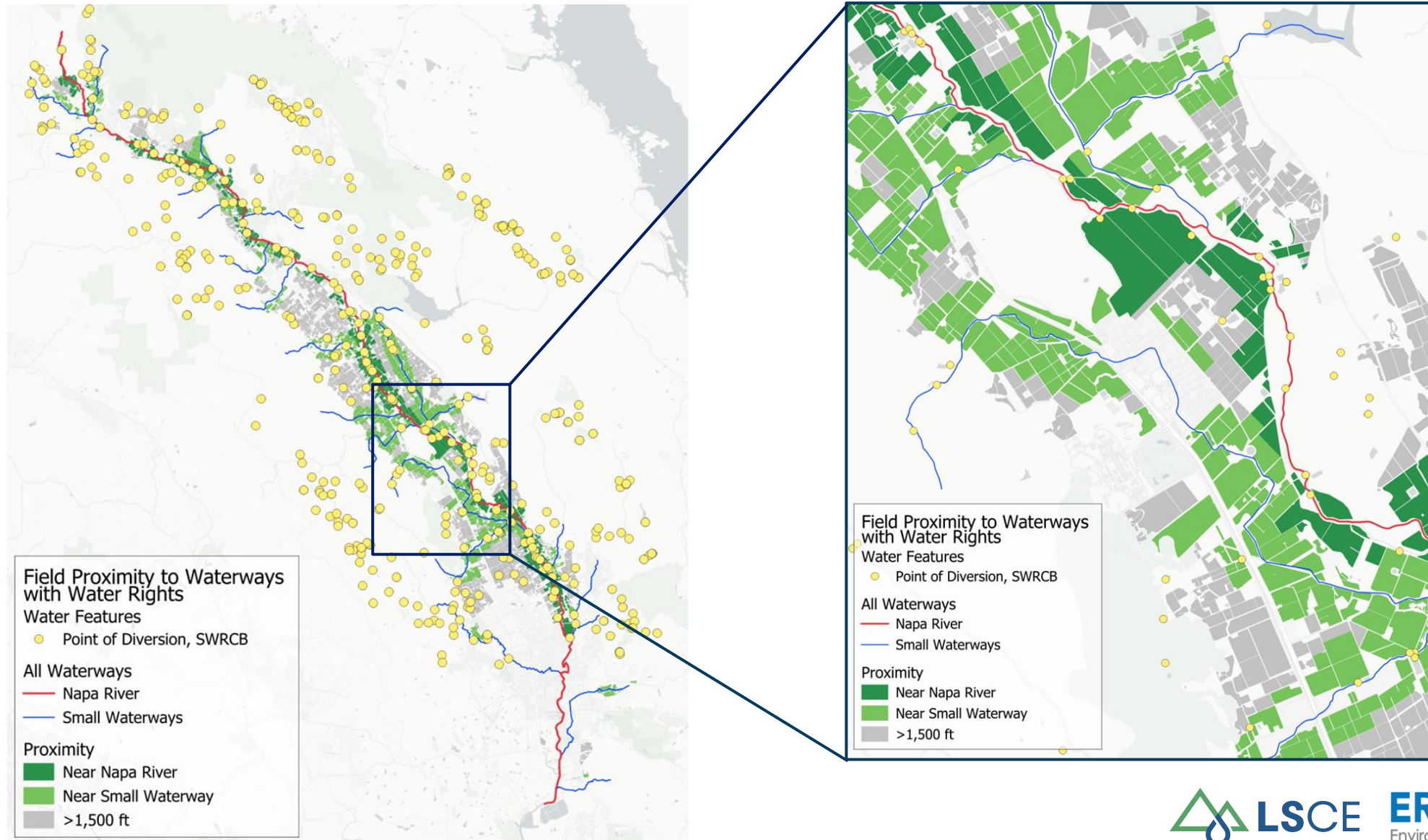
Extended Vineyard Replant Program Concept



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

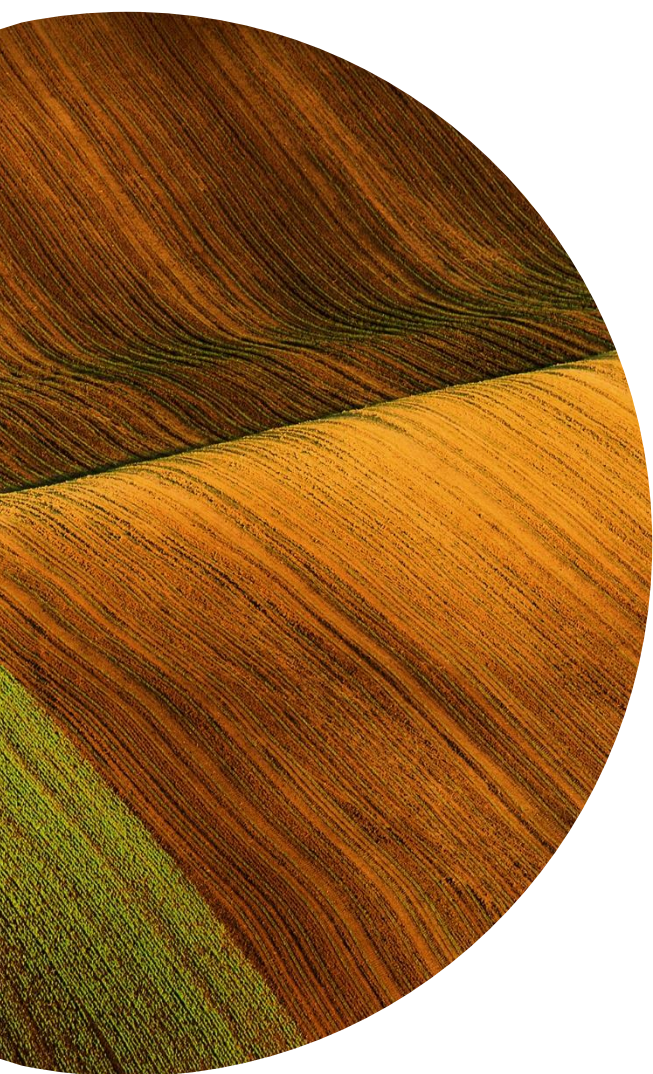
Extended Replant Lands Analysis: Overview



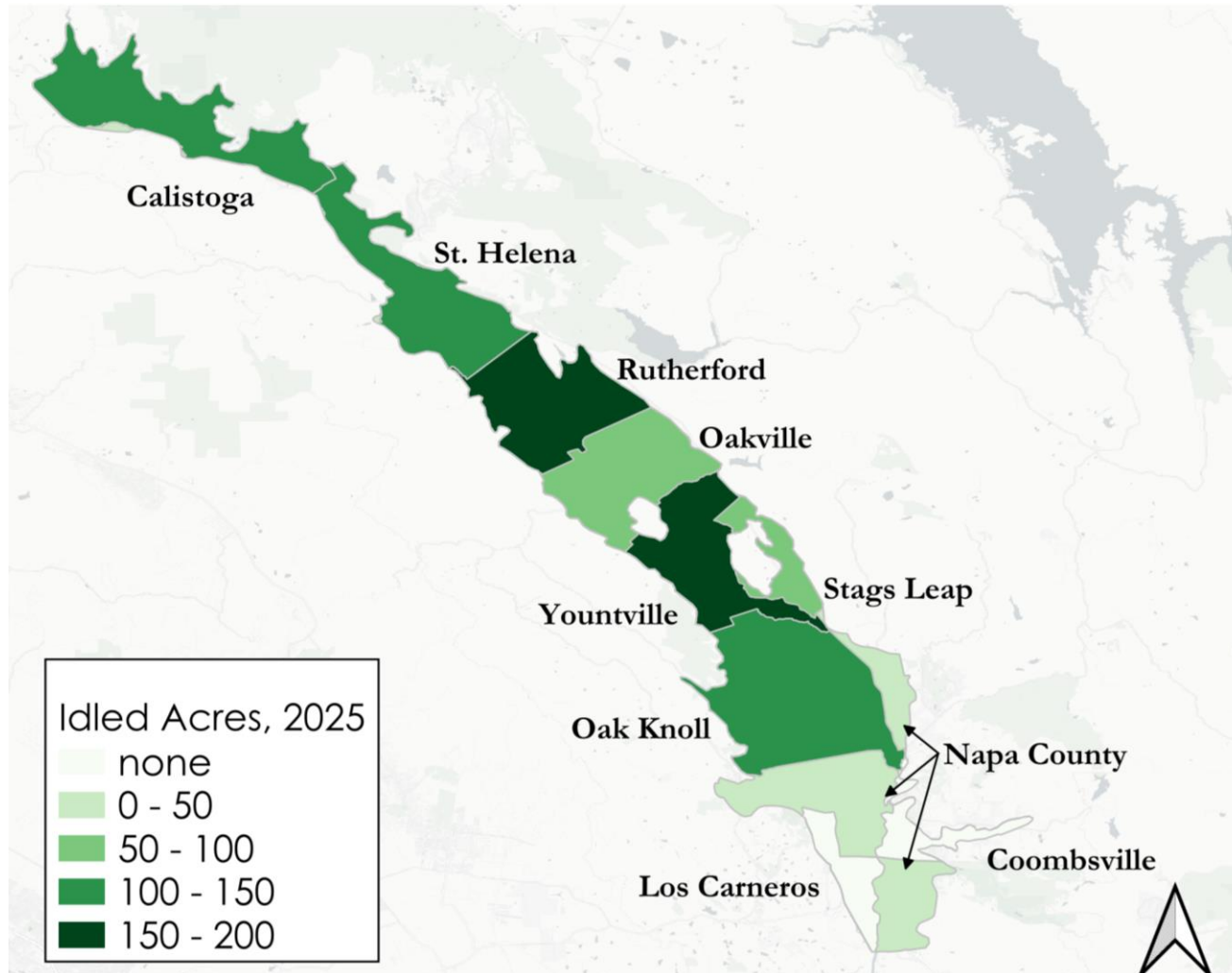
2025 Vineyard Removals

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



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)



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

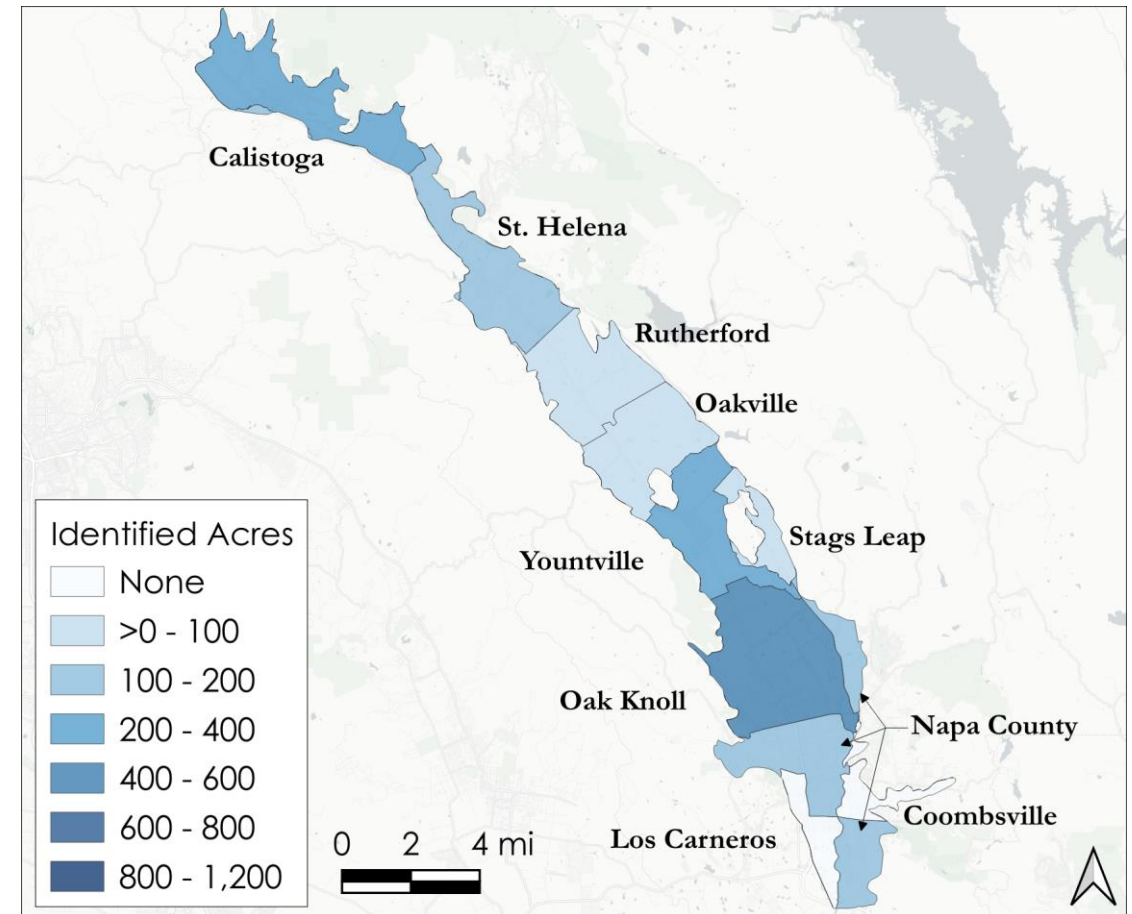
Scenario 1

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

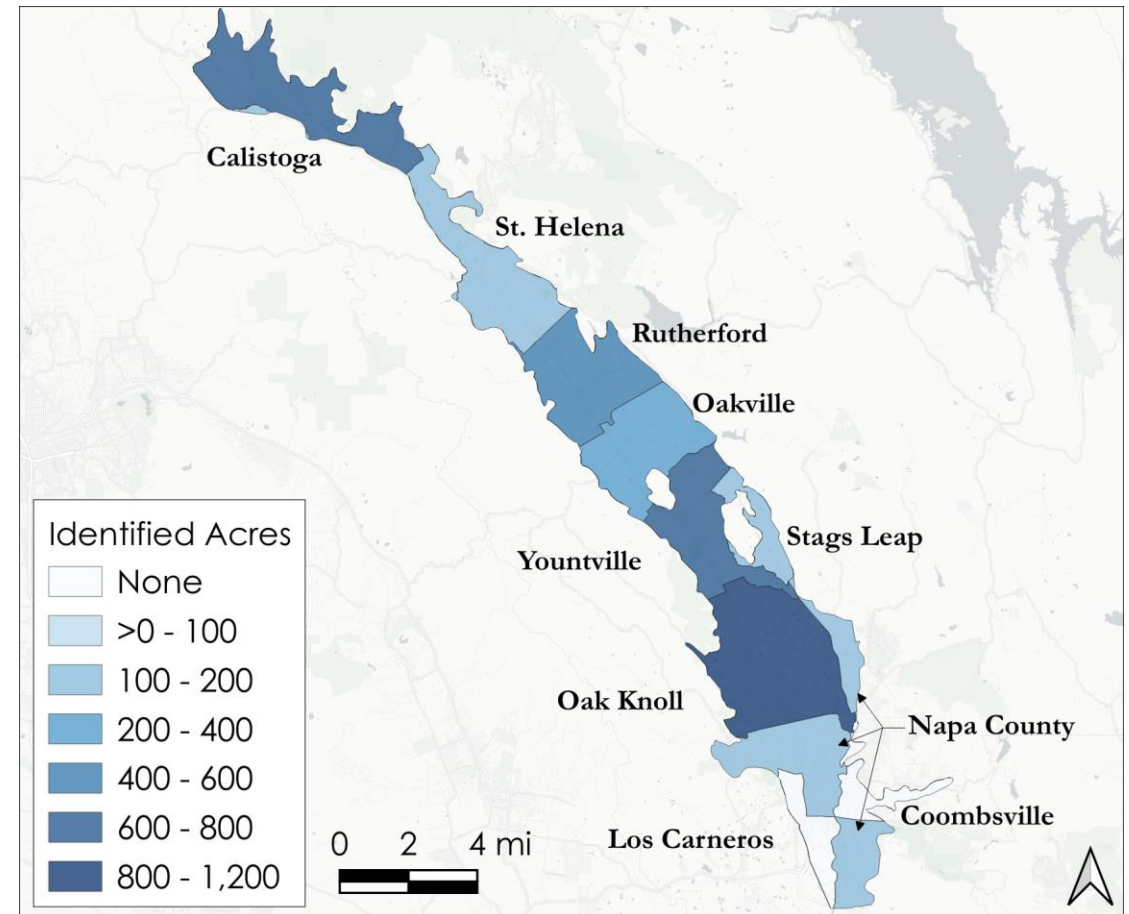


Direct On-Farm Recharge

Preliminary Spatial Screening

- Has **POD** on parcel

APNs	Vineyard Acres	PODs
106	3,665	138

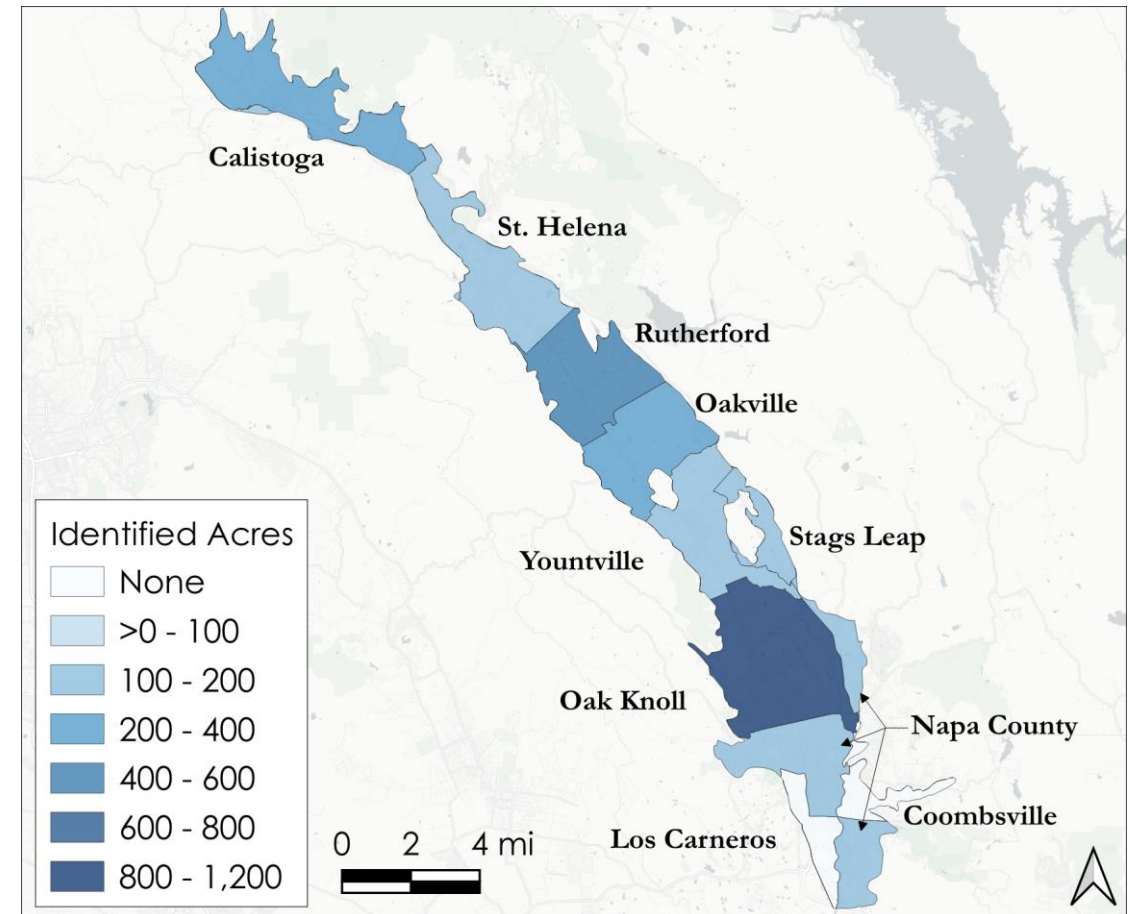


Pumping Reduction

Preliminary Spatial Screening

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

APNs	Vineyard Acres	PODs	Ponds
66	2,322	87	75



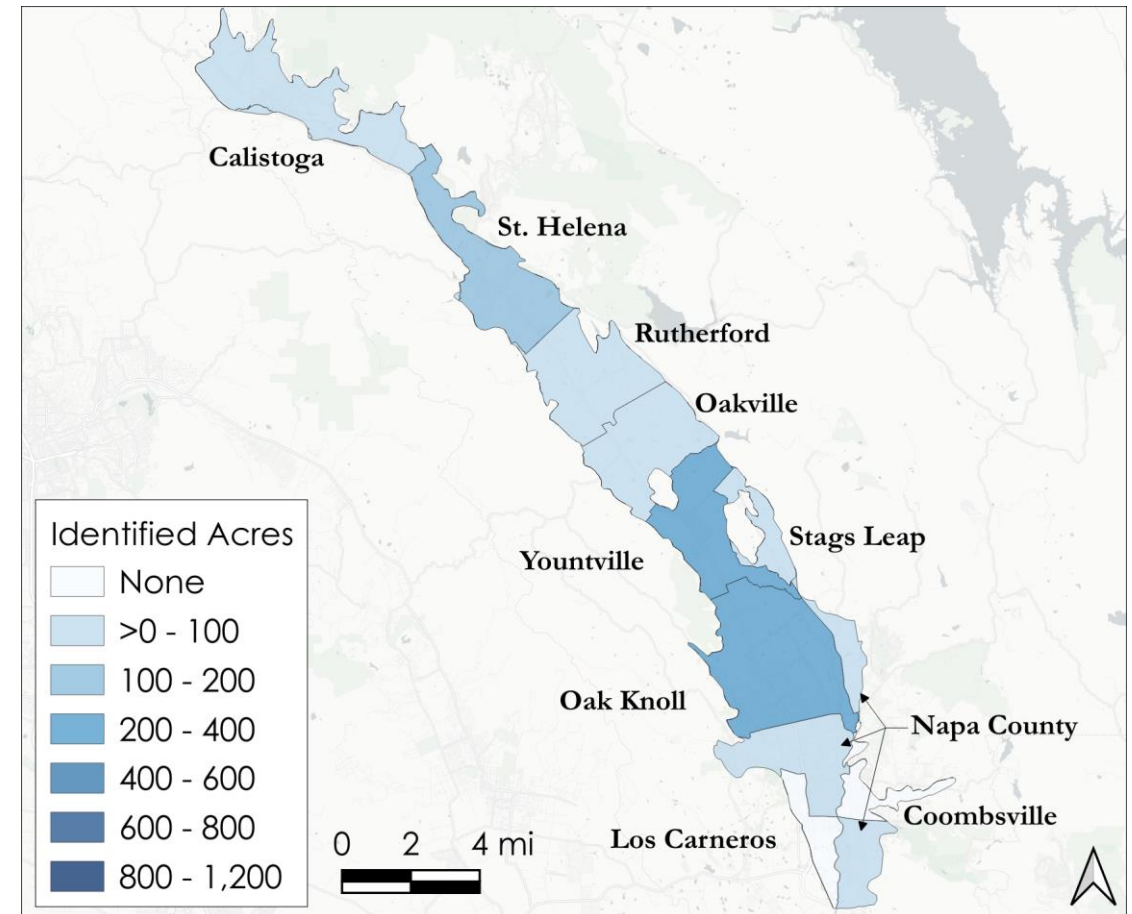
Scenario 4

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





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



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 pumping¹ 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

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)

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