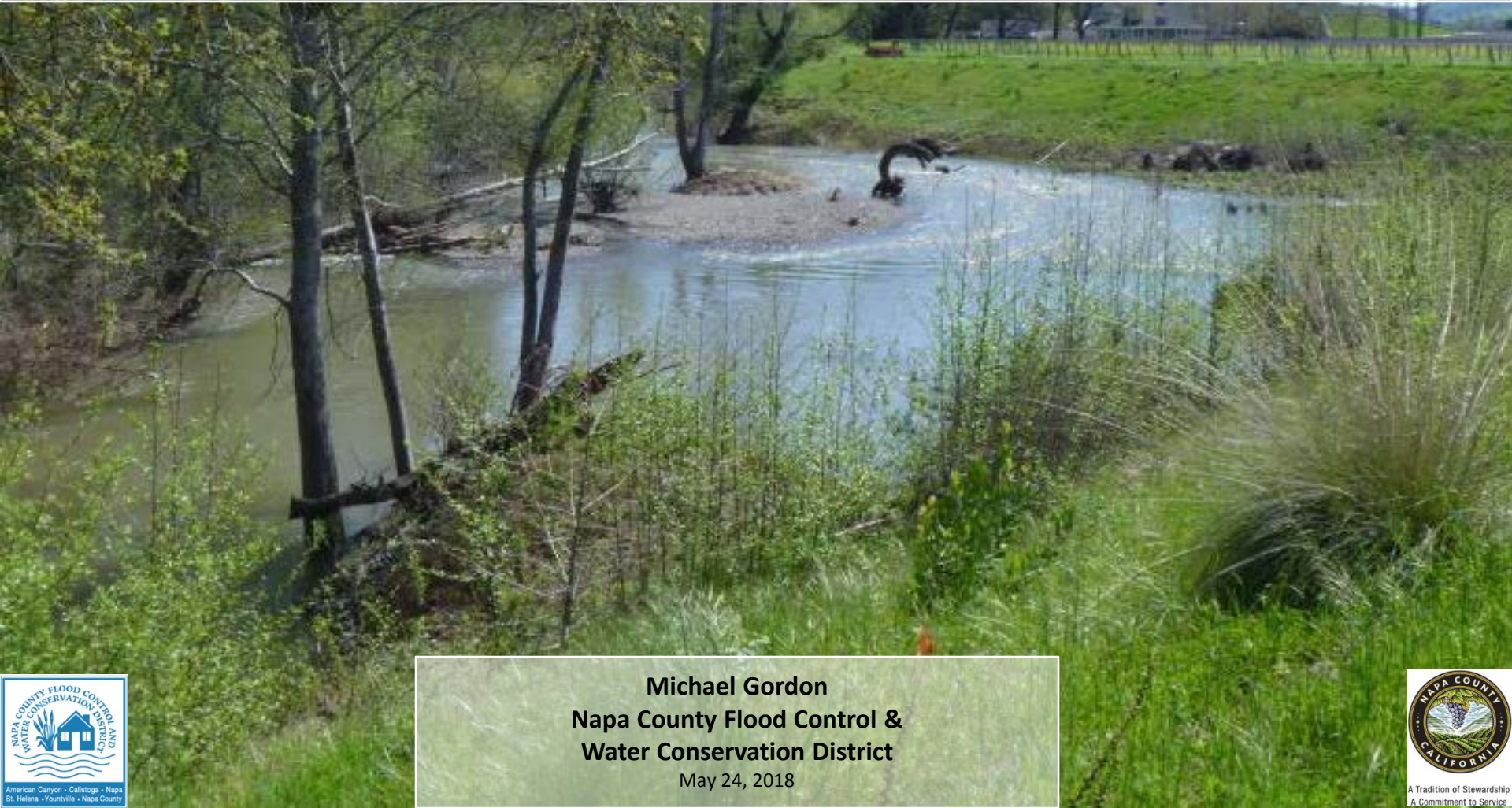


# Rutherford to Oak Knoll: Napa River and Tributary Restoration

An overview of progress and plans,  
including restoration in Bear Creek/Bale Slough watersheds



**Michael Gordon**  
**Napa County Flood Control &  
Water Conservation District**

May 24, 2018





# Napa River and Tributary Restoration

## Outline

- Napa River Restoration
  - Project overview
  - OVOK implementation progress
  
- Bear Creek/Bale Slough Restoration
  - Overview of study findings
  - Landowner outreach and coordination
  - Restoration project design



# Napa River Restoration-Rutherford to Oak Knoll

## Overview

### Project Backgrounds:

The Napa River has been impacted by a range of watershed changes including land drainage, urbanization, levee and dam construction, and the elimination of secondary channels. The result has been **channel incision**, **bank erosion** and the **degradation of both riparian and aquatic habitat**. The Napa River is listed as impaired by sediment and is required to meet the **TMDL**. Despite this, the Napa River still has intact populations of **steelhead trout and fall run Chinook salmon** as well as an array of other wildlife that depends on the riparian forest.





# Napa River Restoration-Rutherford to Oak Knoll

## Overview

### Project Objective:

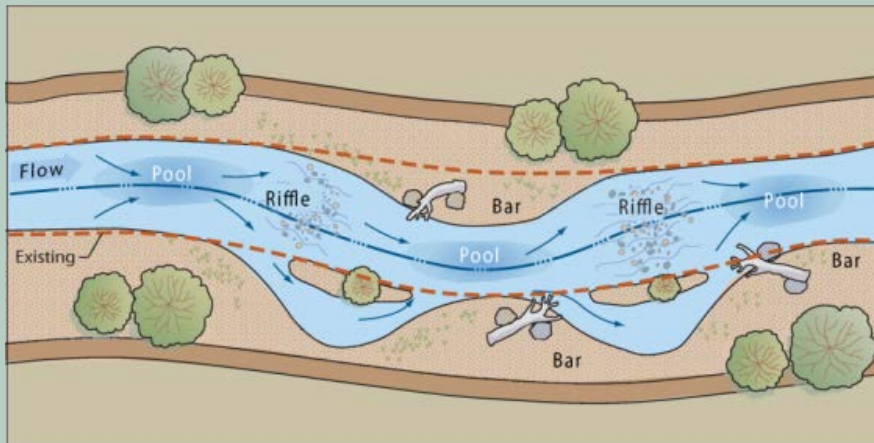
Restore the **physical conditions** that lay the foundation for **habitat recovery** as well as addressing **bank erosion** and **sedimentation** problems.



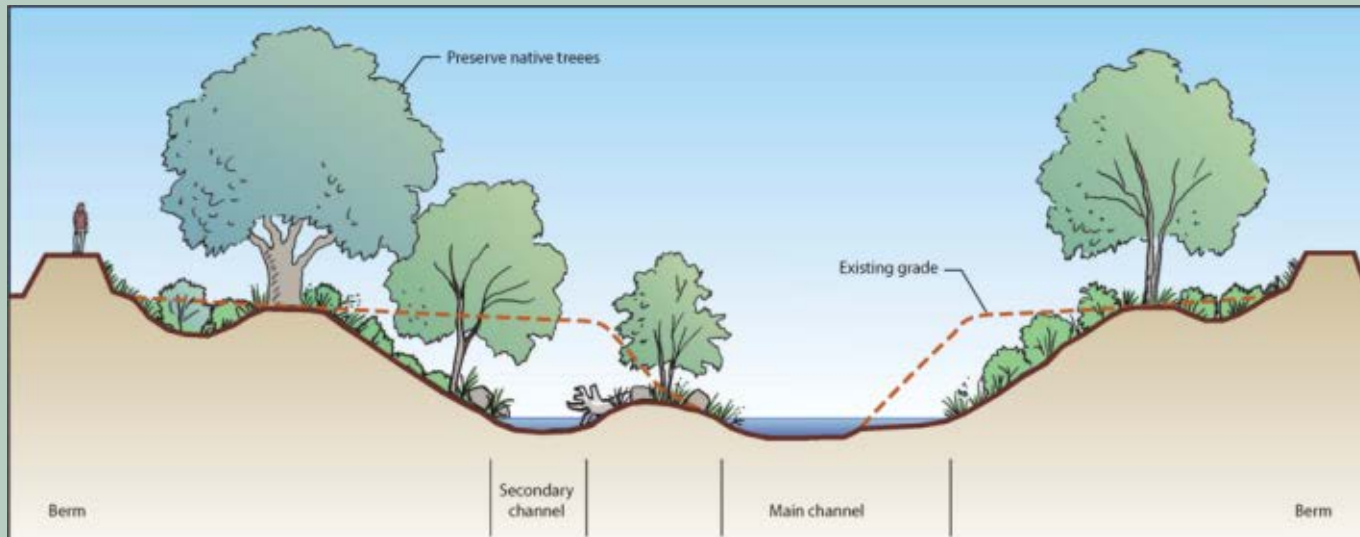


# Napa River Restoration-Design Process

Conceptual Design for Restoration of Geomorphic and Ecological Processes



Instead of cutting continuous floodplain benches we have created a **series of expansion areas** separated by narrower sub-reaches. The expansions and contractions break up the existing long glides and force **riffle-pool formation**. Pools create summer **thermal refugia** while riffles create **spawning habitat**. Expansion areas also provide **high velocity refugia** for juvenile fish and a location for fine sediment to settle out.










# Napa River Restoration-Rutherford Project

## Overview



 Expanded Riparian Corridor  Setback Berms  Floodplain Benches  Tributary Alcove  Instream Structures

3,054 Feet of Secondary Channels Created

31 Acres of Riparian Forest Enhanced

17 Acres of Slow Water Aquatic Habitat Created

2.5 Miles of Channel Widened

147 Instream Habitat Structures Installed

3.25 Acres of *Arundo donax* Eradicated

29 Landowners Participating and Funding Ongoing Monitoring and Maintenance Through an Assessment District





# Napa River Restoration

## Rutherford Reach









# Napa River Restoration-Oakville to Oak Knoll Project

## Overview



 Expanded Riparian Corridor  Setback Berms  Floodplain Benches  Tributary Alcove  Instream Structures

1,000 Feet of Secondary Channels Created

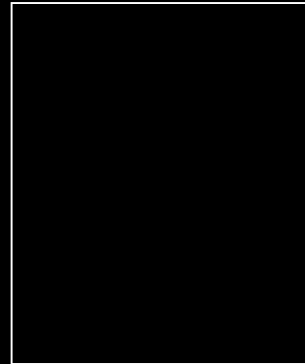
56 Acres of Riparian Forest Enhanced

2.4 miles of Channel widening along the 9 miles  
OVOK Reach

200 Instream Habitat Structures Installed

5 Acres of *Arundo donax* Eradicated

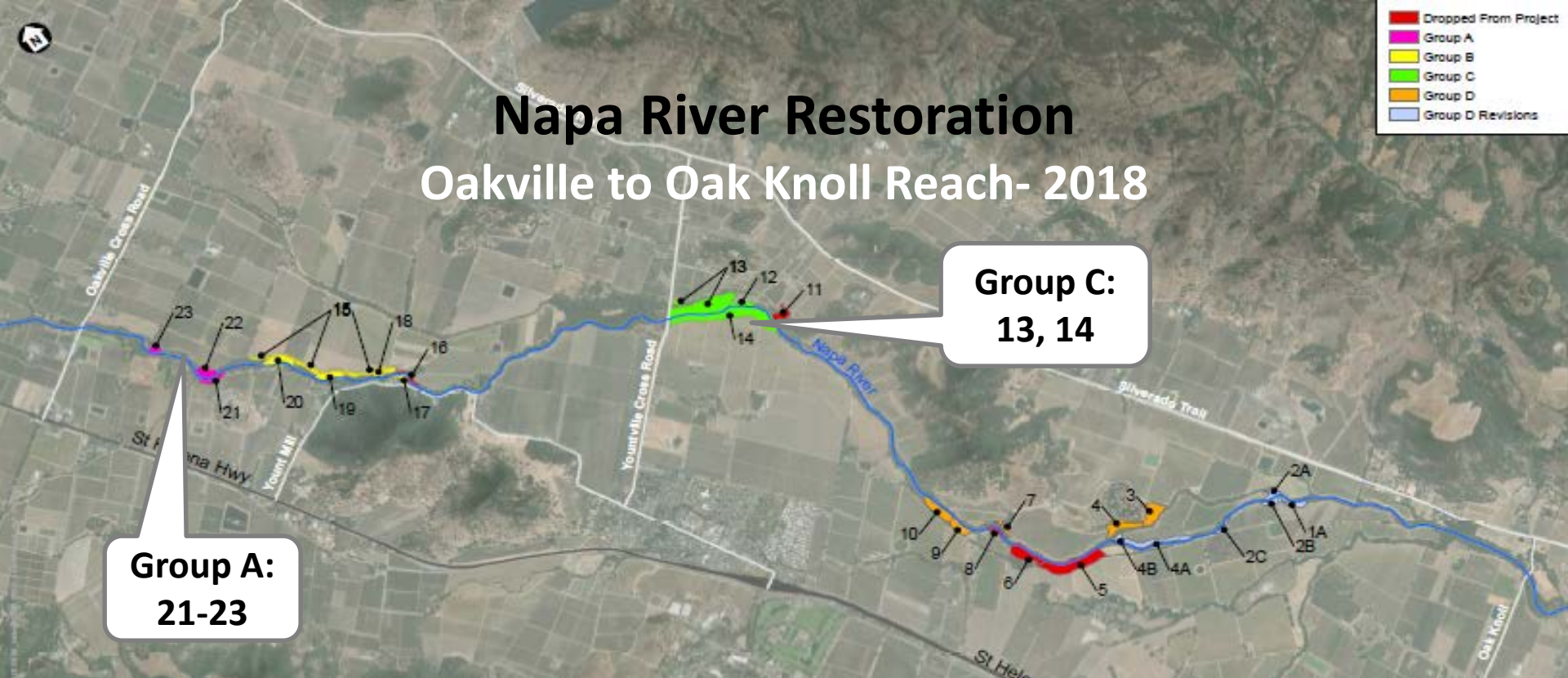
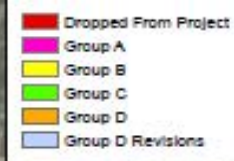
15 Landowners Participating and Funding  
Ongoing Monitoring and Maintenance Through  
an Assessment District





# Napa River Restoration

## Oakville to Oak Knoll Reach- 2018



**Group A:**  
21-23

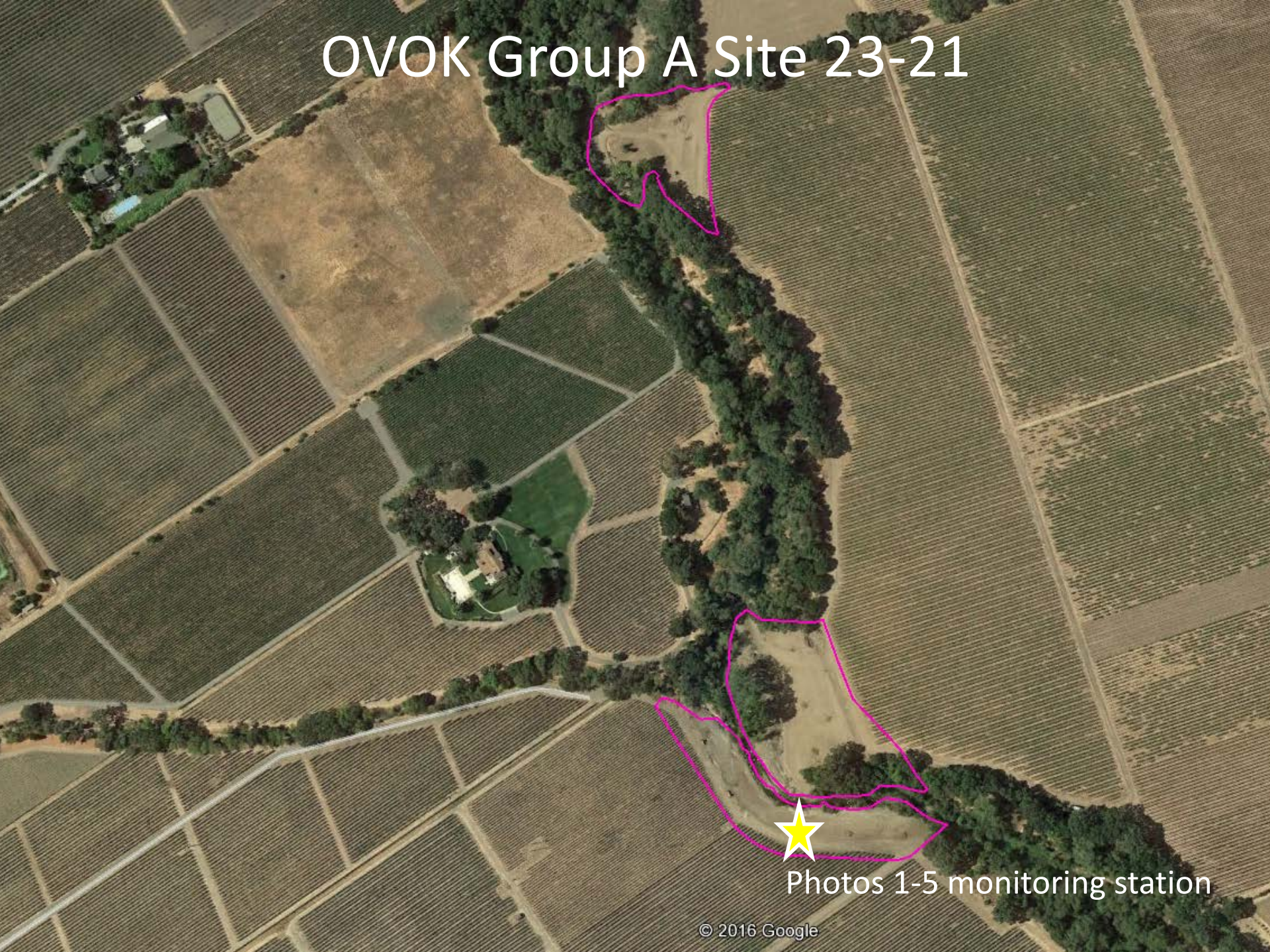
**Group C:**  
13, 14

- Groups/Sites progress:

- Group A; 21, 22, 23- construction complete, revegetation in 2017
- Group C; 12, 13, 14- construction nearly complete, revegetation 2018
- Group B; construction anticipated 2019
- Group D; construction anticipated 2019



# OVOK Group A Site 23-21



Photos 1-5 monitoring station



# Napa River Restoration

## Oakville to Oak Knoll Reach, Group A





**Photo 6: Looking at Site 22 & 23 during high flows**





**Photo 5: Looking from Site 21 at 22 after winter flows**





# OVOK Group C Sites 12, 13, 14

Site 13

Site 12

Site 14

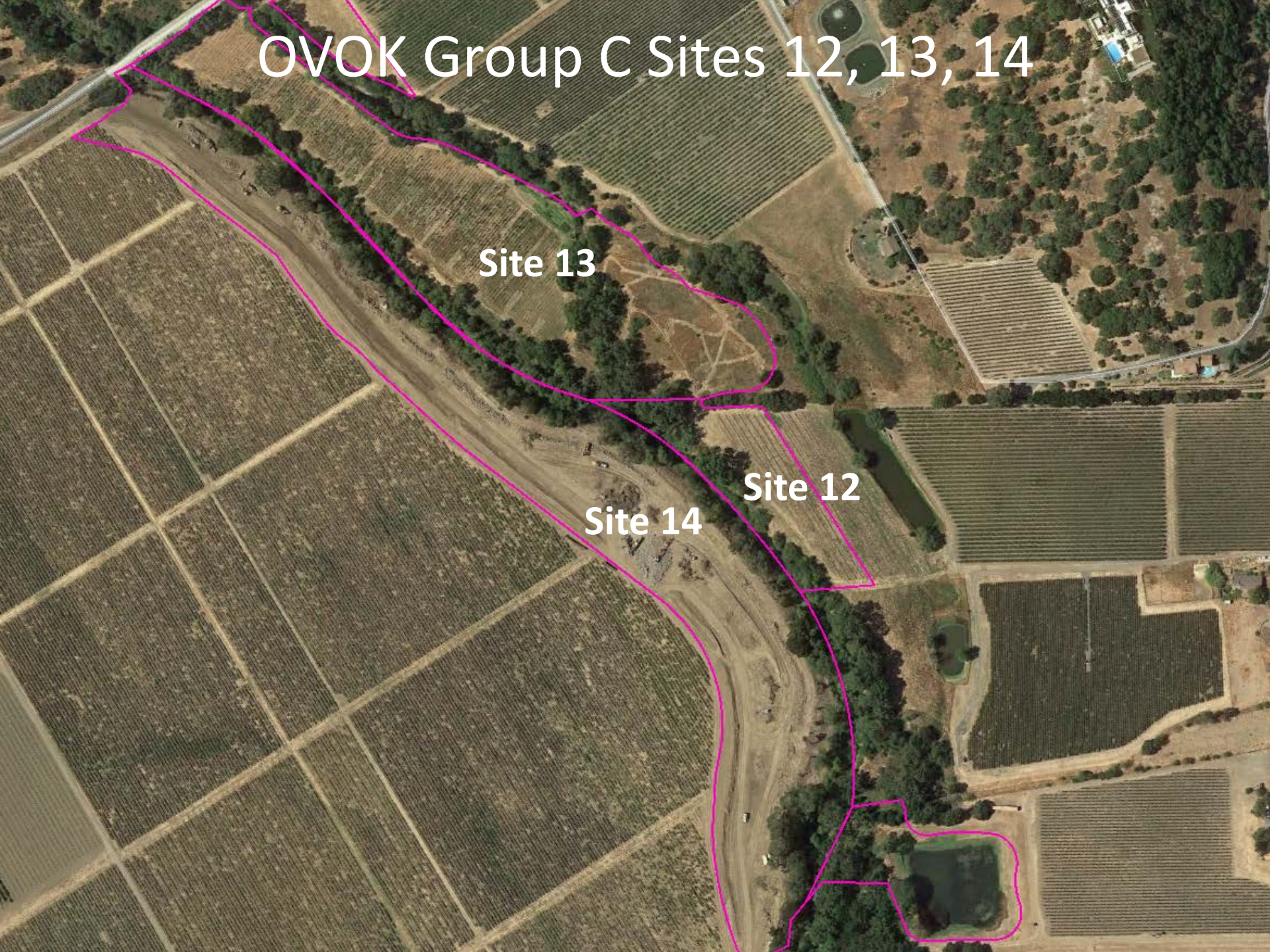




Photo 11: Looking at Site 14 after construction (bench 2)





**Photo 13: Looking at Site 14 during high flows**





**Photo 14: Looking at Site 14 after winter high flows**





# Site 13: Construction of Upland Wetland Feature





# Site 13: Constructed floodplain bench with willow baffles





# Bear Creek/Bale Slough Study

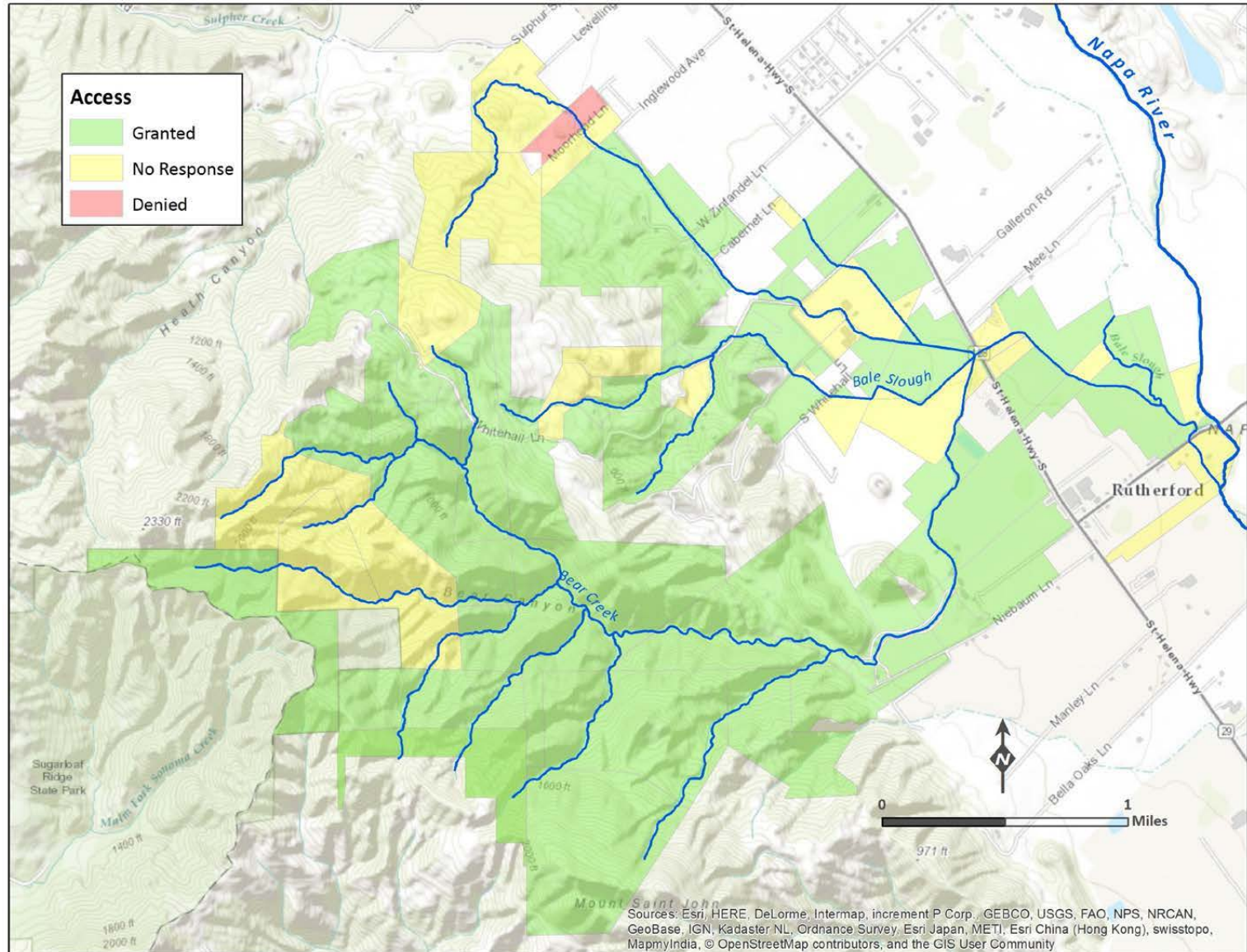
## Project Summary

- Funded by State Water Resources Control Board (319H grant)
- December 2015 – June 2018
- Local Partners:
  - Napa County Flood Control and Water Conservation District
  - Landowners (Long Meadow Ranch, Inglenook, Treasury Wine Estates, etc.)
- Project Components:
  - Landowner outreach and coordination (RCD)
  - Field surveys (RCD, FCD, Consultant)
  - Identify potential restoration areas (RCD, Landowner, Consultant)
  - Develop 30% designs for three restoration sites (RCD, Landowner, Consultant)



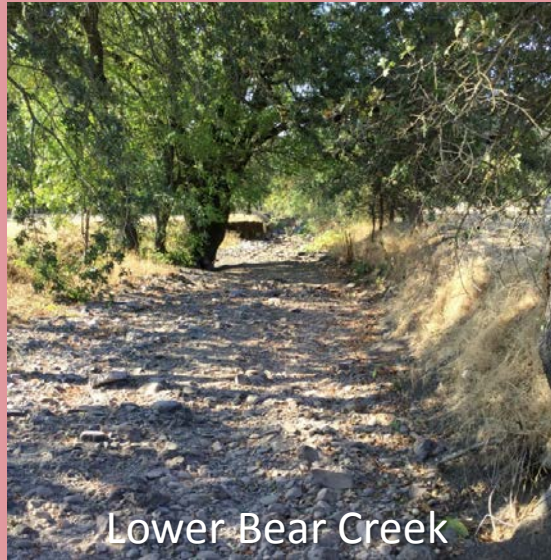
# Landowner Outreach:

85 parcels, 54 landowners





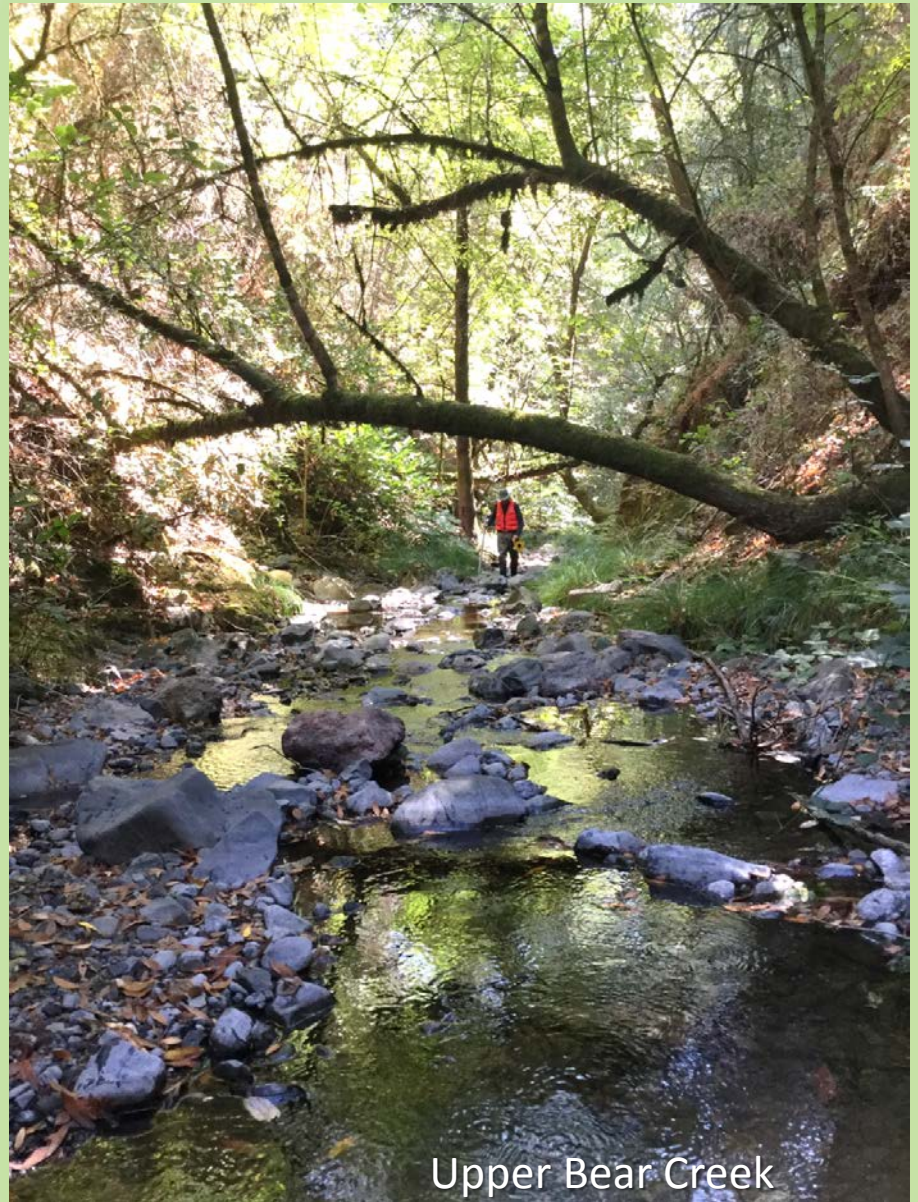
# Habitat Surveys



Lower Bear Creek



Lower Bale Slough

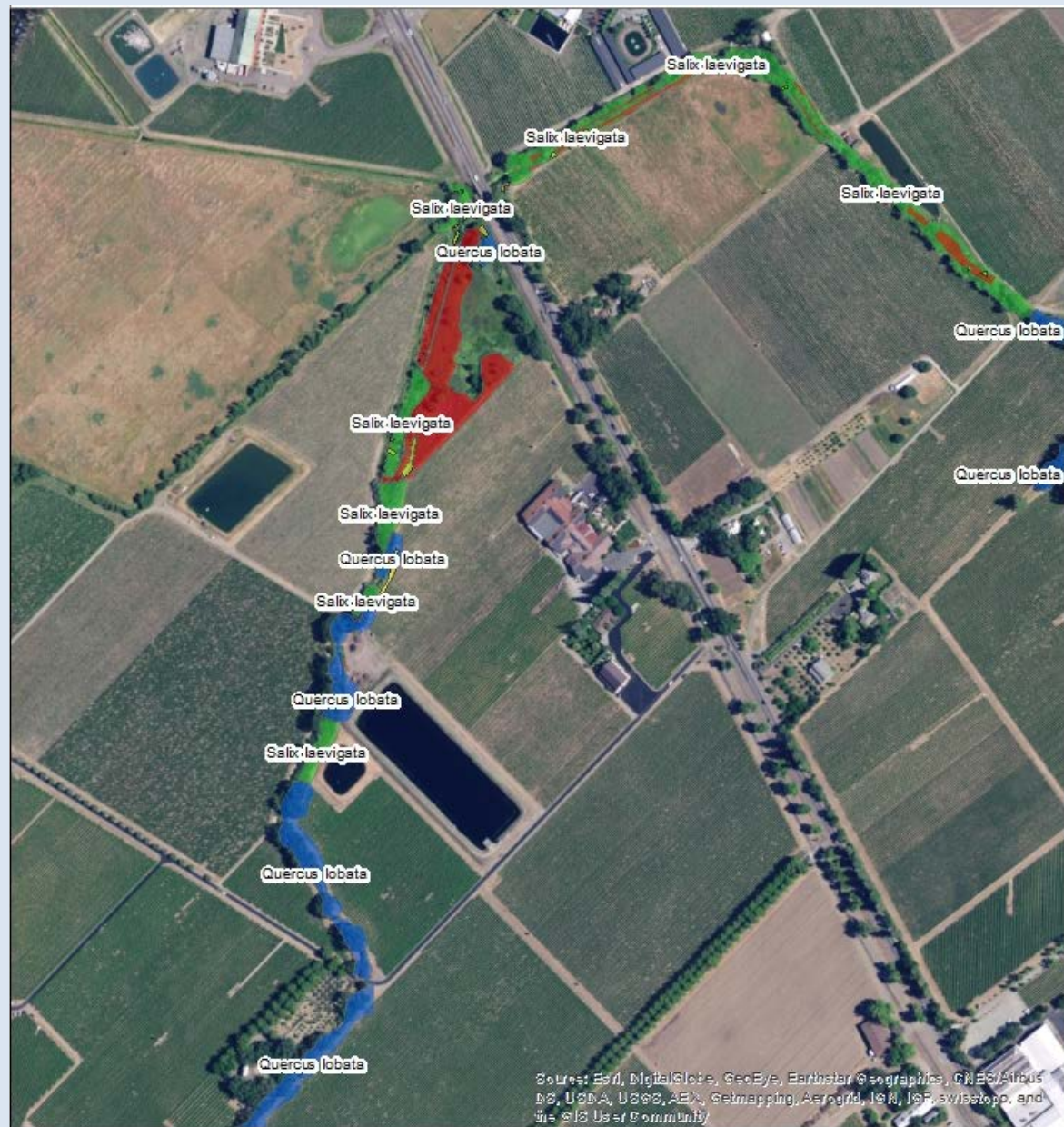


Upper Bear Creek

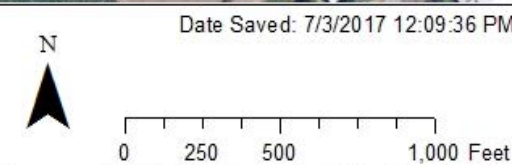


# Vegetation and Invasive Plant Mapping

- Vegetation communities were mapped with finer detail to the “Alliance” level
- Targeted invasive plants (Arundo, Himalayan blackberry, Eucalyptus) were mapped at the patch level
- Distributions of vegetation types and invasive plant patches were considered in the development of potential restoration sites



Invasive Plants		Vegetation Type	
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span> Arundo	<span style="display:inline-block; width:15px; height:15px; background-color:blue;"></span> Quercus lobata	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue;"></span> Acer macrophyllum	<span style="display:inline-block; width:15px; height:15px; background-color:tan;"></span> Eucalyptus globulus/camaldulensis
<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span> Blackberry	<span style="display:inline-block; width:15px; height:15px; background-color:green;"></span> Salix laevigata	<span style="display:inline-block; width:15px; height:15px; background-color:purple;"></span> Ornamental	
	<span style="display:inline-block; width:15px; height:15px; background-color:brown;"></span> Quercus agrifolia		

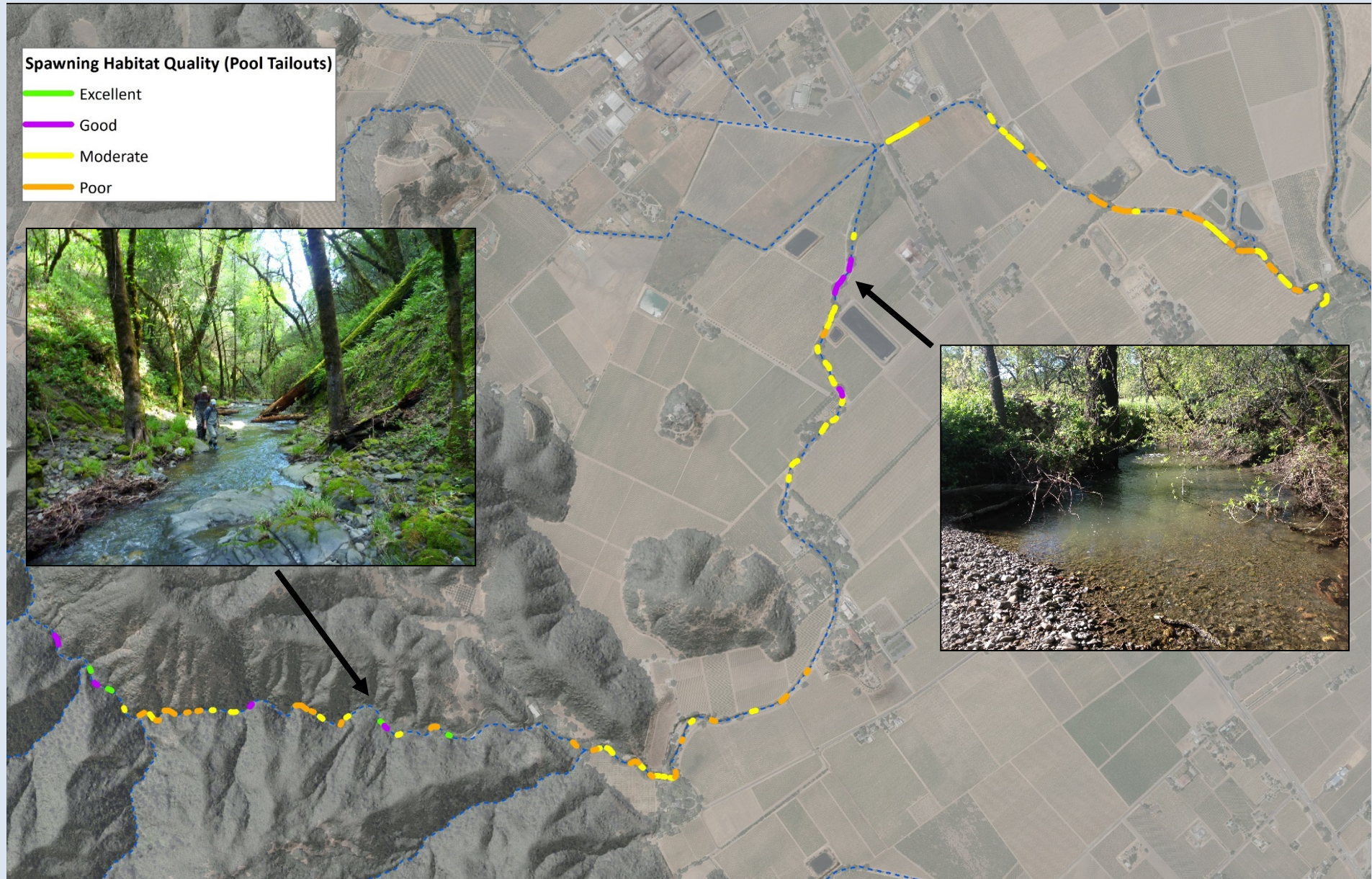
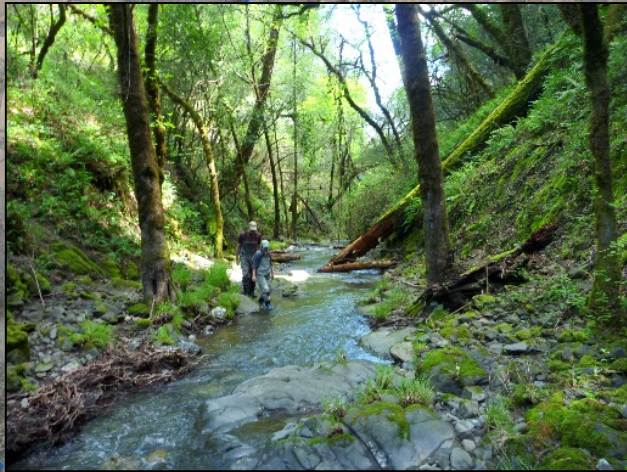




# Steelhead Spawning Habitat Surveys

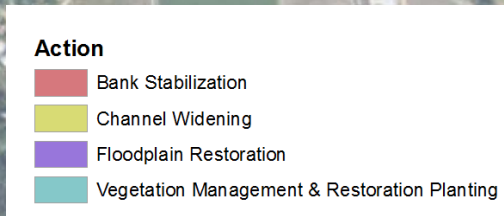
## Spawning Habitat Quality (Pool Tailouts)

- Excellent
- Good
- Moderate
- Poor



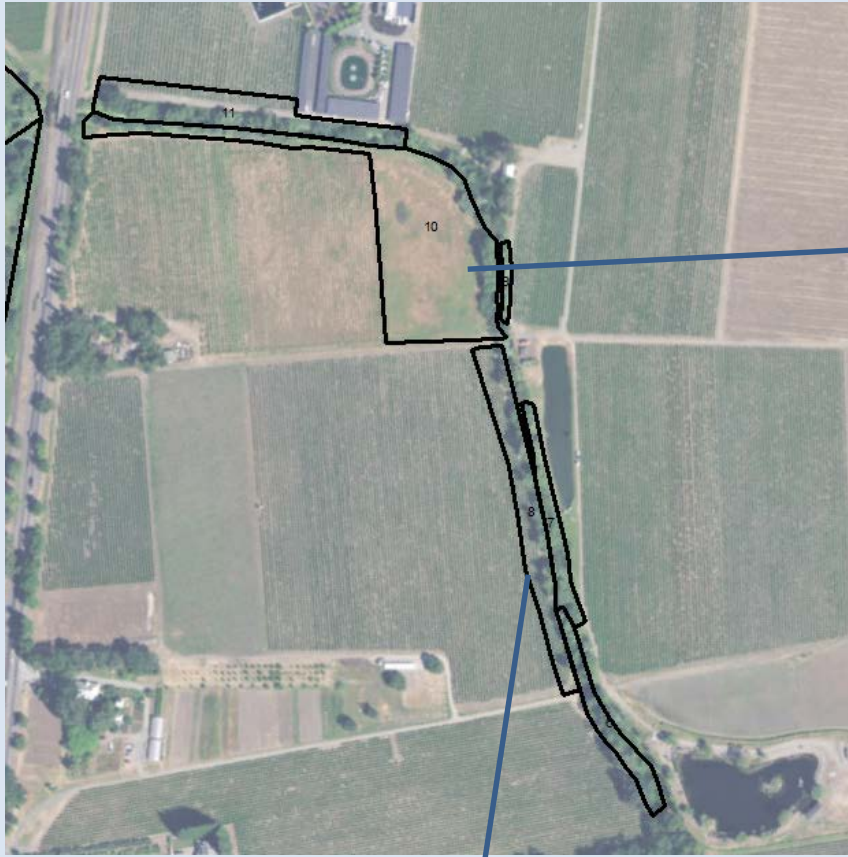


# Distribution of Potential Restoration Sites





# Proposed Restoration Zone Example (Sites 8 & 10)



Site 10 – Reclaim  
Fallow Vineyard, Widen  
Channel, and Create  
Lowered Floodplain


Site 8 – Set Back  
Vineyard, Relocate  
Vineyard Avenue,  
Widen Channel and  
Riparian Corridor





# Wildlife Conservation Board Grant

## Stream Flow Enhancement Program Prop. 1

- 
- Construction of OVOK Groups B and D
  - 100% design for Bear Creek Restoration Project
  - \$3 million total, approx. \$500k for design
  - Estimated construction 2019-2021



# Long-term Maintenance Funding: Oakville Community Facilities District

## Overview:

Funding mechanism to support restoration project planning, implementation, monitoring and maintenance along the Napa River and its tributaries.

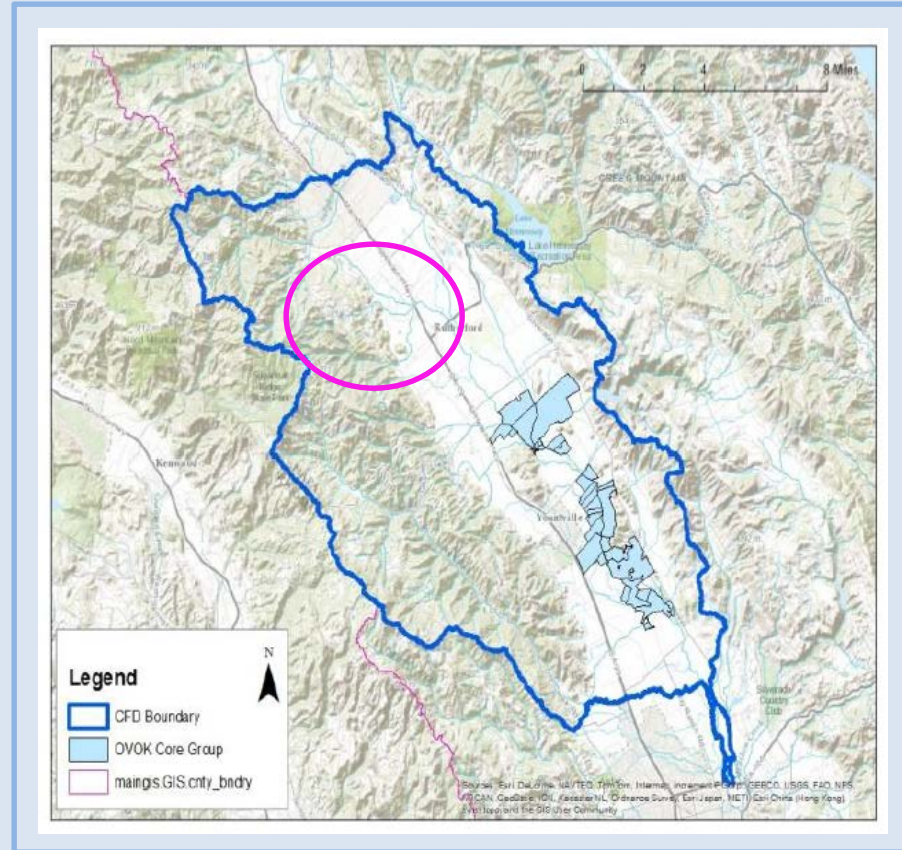
## Funding:

### Base Special Tax

Parcel Classification	Linear Foot Rate	Restoration Linear Foot Rate
Maintenance Parcel	\$0.88	---
Monitoring Parcel	\$0.24	---
Restoration Project Parcel	---	\$1.17

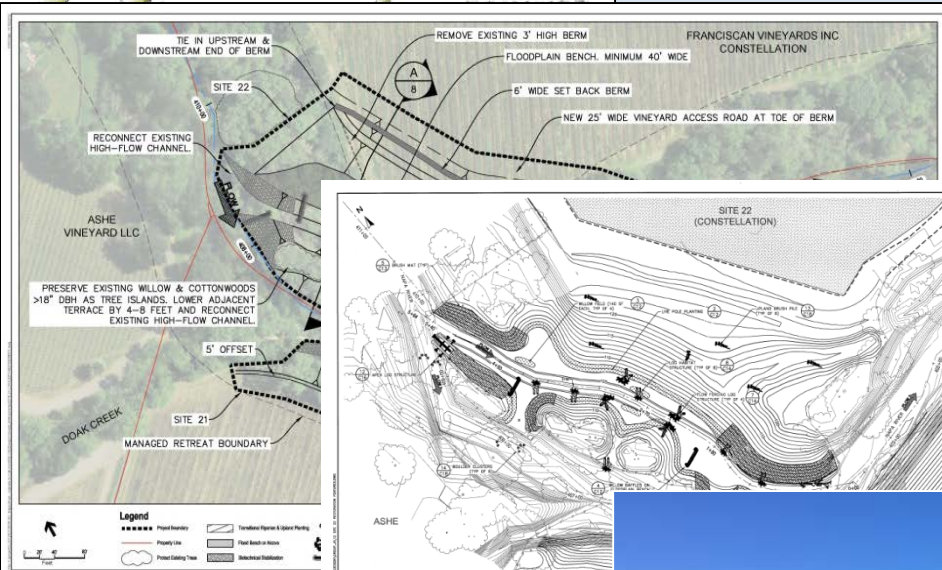
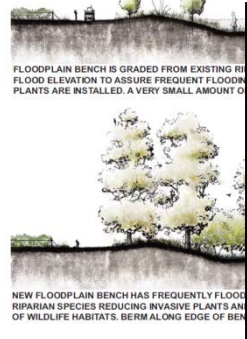
### Optional Service Special Tax

Riparian Enhancement	---	\$75.00
Streambank Enhancement	---	\$200.00
Restoration Planning, Design, & Permitting	---	\$250.00
Restoration Implementation	---	\$1,000





**ACTIVE WIDENING BASED ON RESTORATION AREAS 27 AND 29**



# Design Process: From Concept to Plan to Implementation



Questions?

