

# Measure A Lake Berryessa Watershed Improvement Program

Christopher Silke, P.E.  
Engineering Manager  
Department of Public Works



Courtesy – WICC Interactive Map



# Mission Statement

Enact a project funding mechanism to protect Napa County citizens and property in the unincorporated area of Lake Berryessa from flood damage and support eligible watershed improvements whose goal is to preserve the long-term integrity of a pristine water resource.

# Program Overview

- Genesis – Measure A Ordinance (June 2018 Expiration)
- Revenue - One-Half Percent County Sales Tax
- Lake Berryessa Allocation – 7% Annual Collections
- Approximately \$2.3M in Fund Balance
- Overall Budget Adoption – NCFPWIA (Amendment 27)
- Individual Project MOUs – Board of Supervisors

# Project Enrollment

- Watershed Project Solicitation Packet & Guidelines
- Round 1 Funding Application Submittals in 2017
- Grant Advisory Committee Evaluations & Interviews
- Award Recommendation Notice
- County Counsel Vetting
- Memorandum of Understanding (Funding Agreement)
- Board of Supervisors Action
- Round 2 Call For Projects July 2018

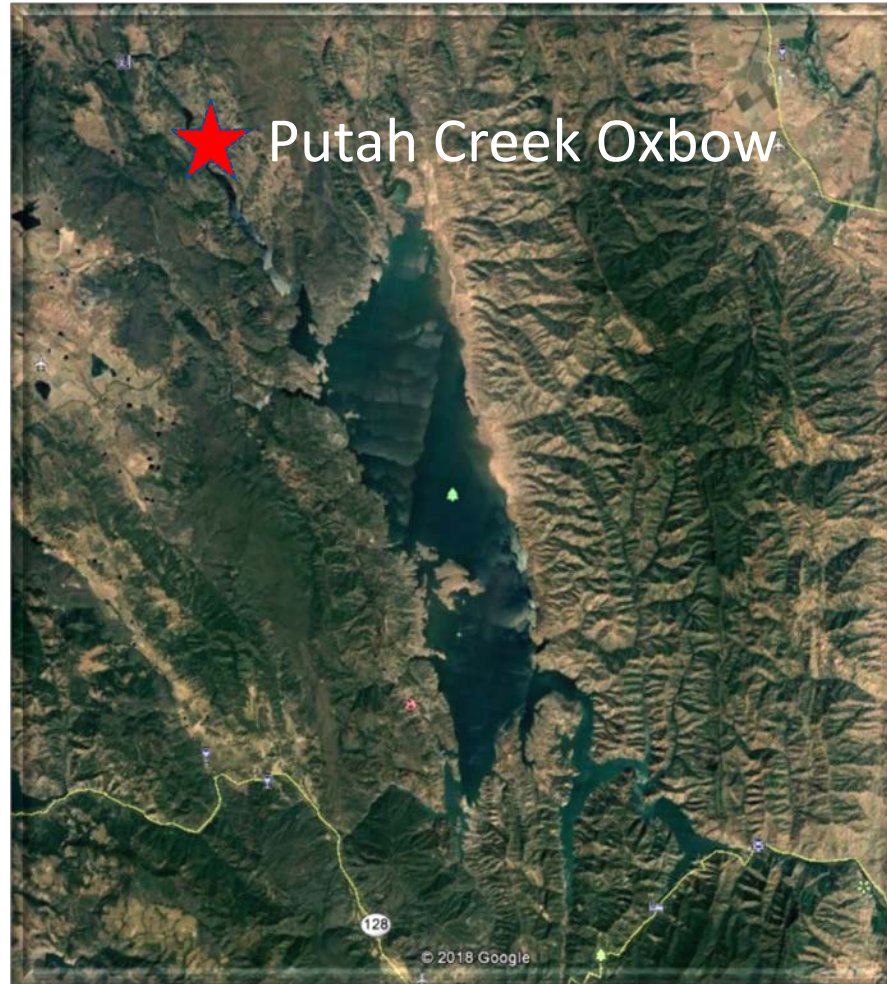
# Types of Projects

- Agricultural Watershed Improvements
- Stormwater Runoff Management  
(Sediment Mobility Suppression)
- Invasive Species Control  
(Hydrology / Stream Channel Hydraulic Betterments)
- Natural Wetland Buffer Creation
- Water Quality Restoration
- Watershed Protection Activities

# Lake Berryessa Impairment Risks

- Wildfires Exposing Steep Slopes / Fine Soils / Debris
- Fire Retardants
- Naturally Occurring Metals / Legacy Mines / Hg
- Non-Native Species Introduction / Infestations
- Nutrient Loads / Algal Blooms / Cyanotoxins
- Microbial Pathogens
- Climate Dynamics / Drought / Extreme Rainfall / Temp

# Lake Berryessa Observations





# Algae Blooms



September 2015



September 2017



# Drought / Periphyton Infestation



Dry Creek Bed – September 2014



*Didymo* – August 2015

# Sediment / Debris Loads



High Turbidity – January 2017



Wildfire – October 2017

# Past Berryessa Full Reservoir Views



February 2003



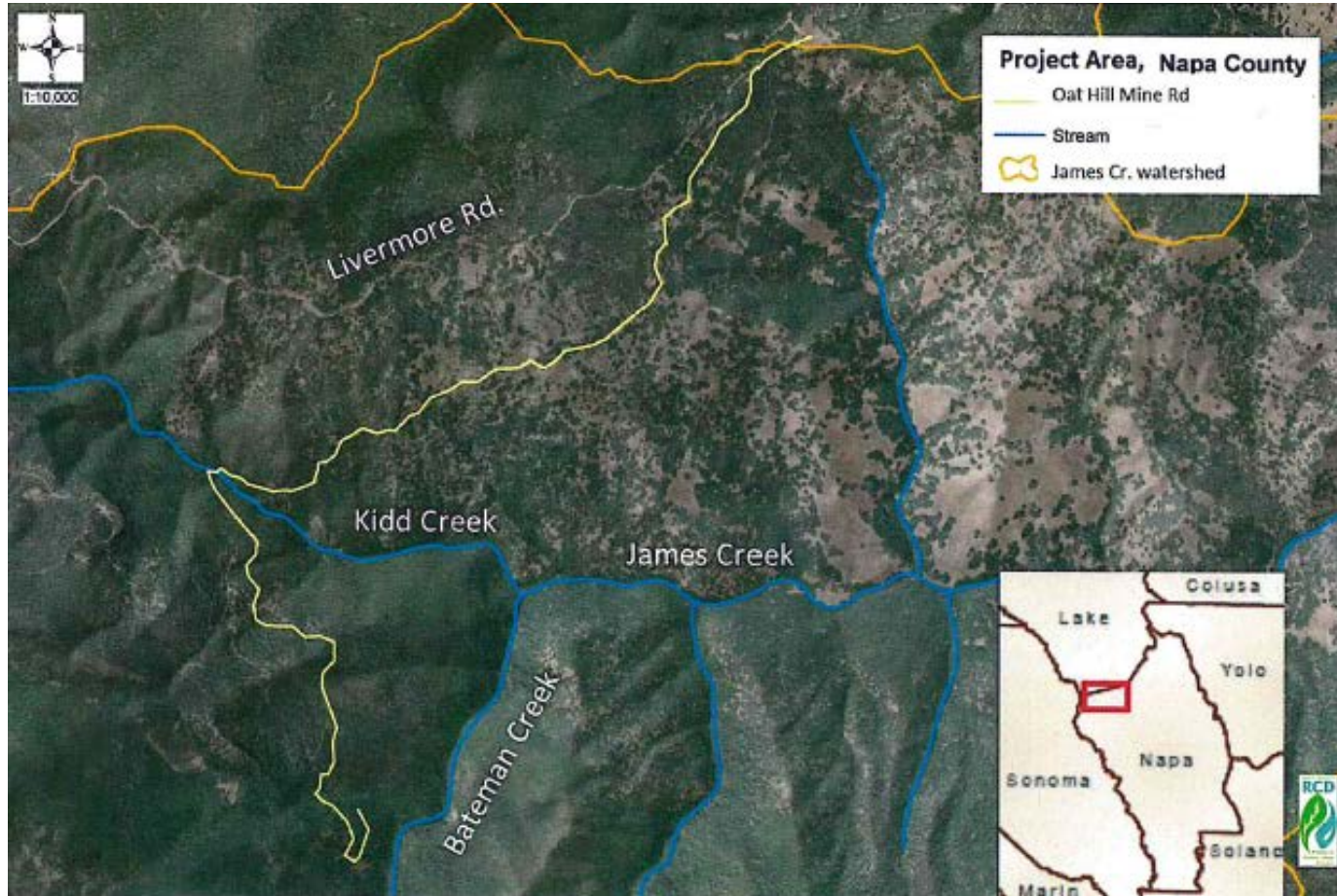
June 2011

# Oat Hill Mine Road Erosion & Sediment Control

- Measure A Funding Obligation - \$230,500
- Project Sponsor – Tuleyome
- Team of Professionals / Construction Crew
- 3 mile Segment of Oat Hill Mine Road
- Significant Erosion
- 25 Drainage Crossings Undersized / Washouts
- Legacy Mine Metals
- Gravel Road Bank / Surface Scour
- Lack of Vegetative Cover
- Activity April 2018 through June 2020



# Oat Hill Mine Road Erosion & Sediment Control



# Oat Hill Mine Road Erosion & Sediment Control



**Figure 1. Overloaded and plugged culvert leads to localized flooding and erosion.**



# Oat Hill Mine Road Erosion & Sediment Control



**Figure 2. Roadway completely flooded and eroding downslope.**

# Oat Hill Mine Road Erosion & Sediment Control



**Figure 2. Roadway completely flooded and eroding downslope.**



# Oat Hill Mine Road Erosion & Sediment Control



**Figure 3. Minor water way from own ditch and erodes roadway.**

# Oat Hill Mine Road Erosion & Sediment Control



**Figure 4. Tire tracks become ditches during rain event.**

# Upper Hunting Creek Restoration

- Measure A Funding Obligation - \$111,000
- Project Sponsor – UC Davis
- Seasonal Conservation Crews
- McLaughlin Reserve Land (Northeastern Napa County)
- Erosion Control – Armoring / Head Cut Repairs
- Restore Natural Overland Flow Patterns
- “Zuni Bowl” Construction – Sediment Capture
- Road Remediation
- Serpentine Meadow Flourishment
- Activity April 2018 through June 2020

# McLaughlin Reserve – Site 1

- Abandoned Road – 1 km Extensive Soil Loss
- Insert Water Bars
- Build Rock Structures
- Largely Handwork
- Original Drainage Channels
- Place Indigenous Meadow Grasses



# McLaughlin Reserve – Site 1



Site 1. Erosion in a serpentine meadow caused by an abandoned road. At the top of the photo the road crosses a transverse ridge diverting water from the background sub-watershed into this one.



Site 1. Moving upslope towards the diversion point. This channel should not require armoring once water is redirected to its historic flow within sub-watersheds.



Site 1. The diversion point where the road crosses a transverse ridge and diverts flow from the foreground to the background.



Site 1. One of numerous places along the site 1 road cut where water bars will be built to restore historic drainage patterns.

# McLaughlin Reserve – Site 2

- Failed Drainage Structure
- Abandoned Mine Pipeline ROW
- Multiple Deep Head Cuts
- Reconfigure Drainage to Historic Pathway
- Sediment Retention – “Zuni Bowls”
- Perennial Plant Plugs

# McLaughlin Reserve – Site 2



Site 2. A failed drainage ditch from an old pipeline right of way. Similar to site 1, the ditch diverts water from the background sub-watershed into the foreground.



Site 2. The failed ditch has initiated a head cut that threatens serious erosion of this serpentine meadow.



Site 2. The diversion point. Water will be redirected from the ditch, across the right-of-way, into its historic drainage.



Site 2. Further downstream of the the failed ditch. Restoring historic drainage patterns will prevent further downcutting here.



# Questions / Comments

