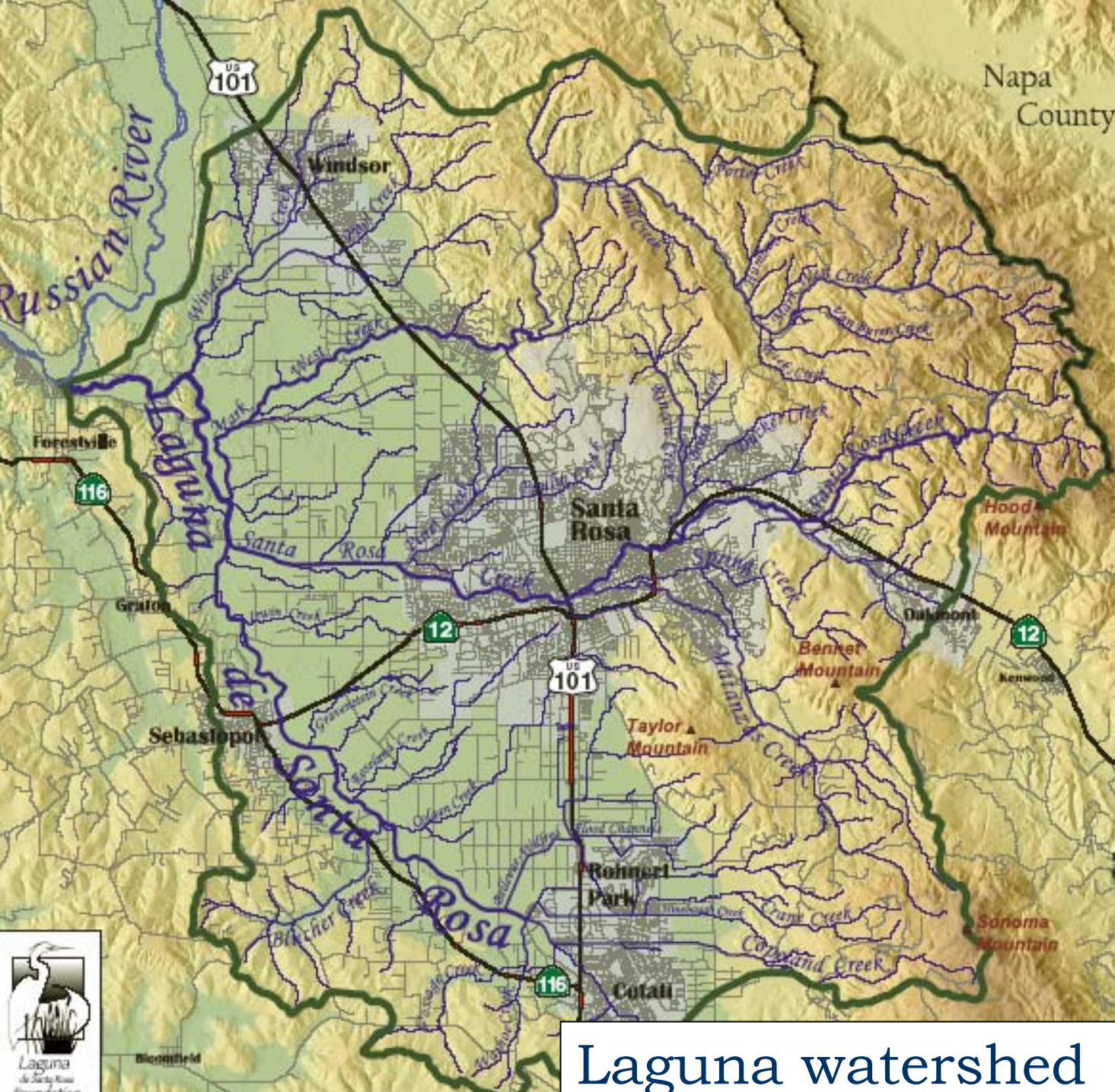


# Control of Water Primrose (*Ludwigia* sp.) in a Freshwater Wetland



**Presented by Julian A. Meisler  
Laguna de Santa Rosa Foundation  
Sonoma County, CA**



Laguna watershed

# Potential Problems Associated with *Ludwigia* in the Laguna

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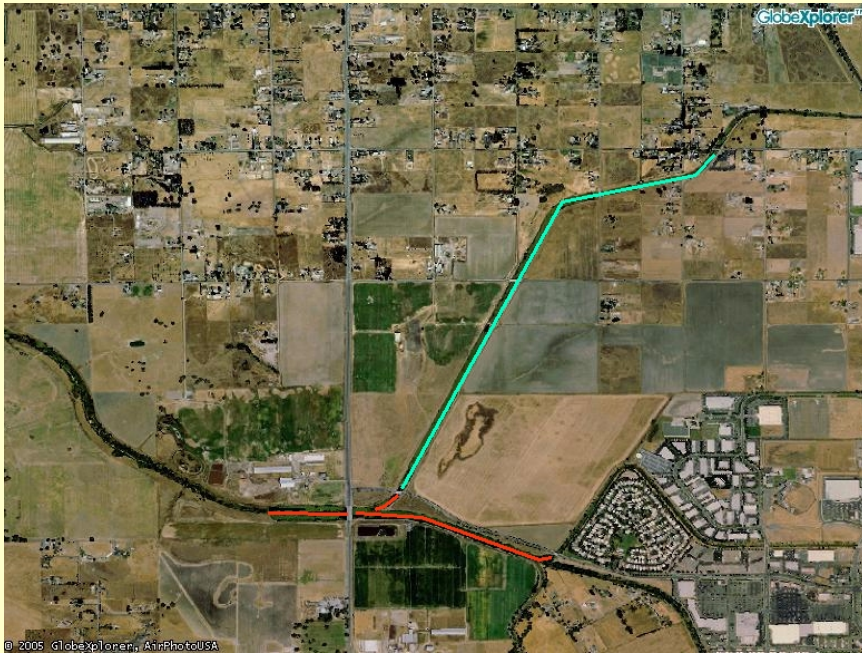
- **Loss of Biodiversity**
- **Decrease Water Quality**
- **Increase Duration and Frequency of Flooding**
- **Inhibit control of Mosquitoes that may carry West Nile Virus**



# Project Sites

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## Sonoma County Water Agency



## CA Department of Fish & Game



**+/- 10,000 linear feet channel and 100 acres of flooded fields**

# Action Plan

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## Long Term Restoration

**GOAL: Implement restoration activities to address root causes.**

- **Riparian Restoration**
- **Nutrient Reduction**
- **Sediment Reduction and Dredging**

## Short Term Control (three year effort)

**GOAL: Reduce populations in target areas to manageable level.**

- **Herbicide**
- **Mechanical Removal**
- **Vegetation Disposal**

# Monitoring: Vegetation

## Vegetation Sampling

- Forty-three 4x5 m plots
- Species Composition
- Species Cover
- Water Depth
- Height of Canopy

## Photo Monitoring

- 31 photo monitoring stations
- 67 photos

## Biomass Sampling

Range: 2,400 – 9,000 tons

or

5,000,000 – 18,000,000 lbs



# Monitoring: Water Quality

## Water Quality Monitoring Requirements

- Temperature
- Turbidity
- Roaming Turbidity
- Specific Conductivity
- Glyphosate
- Cygnet Plus
- Aminomethyl-phosphonic acid (AMPA)
- pH
- Dissolved Oxygen
- Hardness ( $\text{CaCO}_3$ )



# Herbicide Application: Spray

## Herbicide Mix

- **Glypro® - glyphosate**
- **Cygnel Plus® - surfactant**
- **StaPut® – drift control agent**
- **Blue Marker Dye**
- **Water**

## Precautions

- **Careful measurement of volume**
- **GPS**
- **<10 mph only**





# Herbicide Application: Channel Clearing

## Cookie Cutter



# Herbicide Application: Spray

## Equipment

- Airboat
- Swamp Cat
- Truck Rig
- Backpack Sprayer



# Herbicide Application: Effect



**July 2005**



**August 2005**

# Herbicide Application: Effect



**July 2005**



**August 2005**

# Herbicide Application: Effect



**July 2005**



**August 2005**

# Mechanical Removal

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**Long Reach Excavator**

# Mechanical Removal

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**Aquatic Harvesters**

# Mechanical Removal: Effect in Channels

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**July 2005**



**September 2005**





# **Mechanical Removal: Effect in Floodplain**



**Pre-removal**



**Post-removal**

# Vegetation Disposal

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# Lessons Learned

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## Incomplete Kill and Rapid Regrowth

- **Herbicide? Surfactant?**
- **Method of Application?**
- **Timing?**



# **Project Supporters**

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**Sonoma County Water Agency**

**California Wildlife Conservation Board**

**Marin Sonoma Mosquito Vector Control**

**Santa Rosa Subregional Wastewater System**

## **Contractors**

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**Clean Lakes, Inc.**

**Blankinship & Associates**

