



SANTA ANA WATERSHED  
PROJECT AUTHORITY

# Middle Santa Ana River TMDL Task Force Consultant Support

Commission Meeting  
Item Number 6.A

Rick Whetsel  
Senior Watershed Manager

November 5, 2024

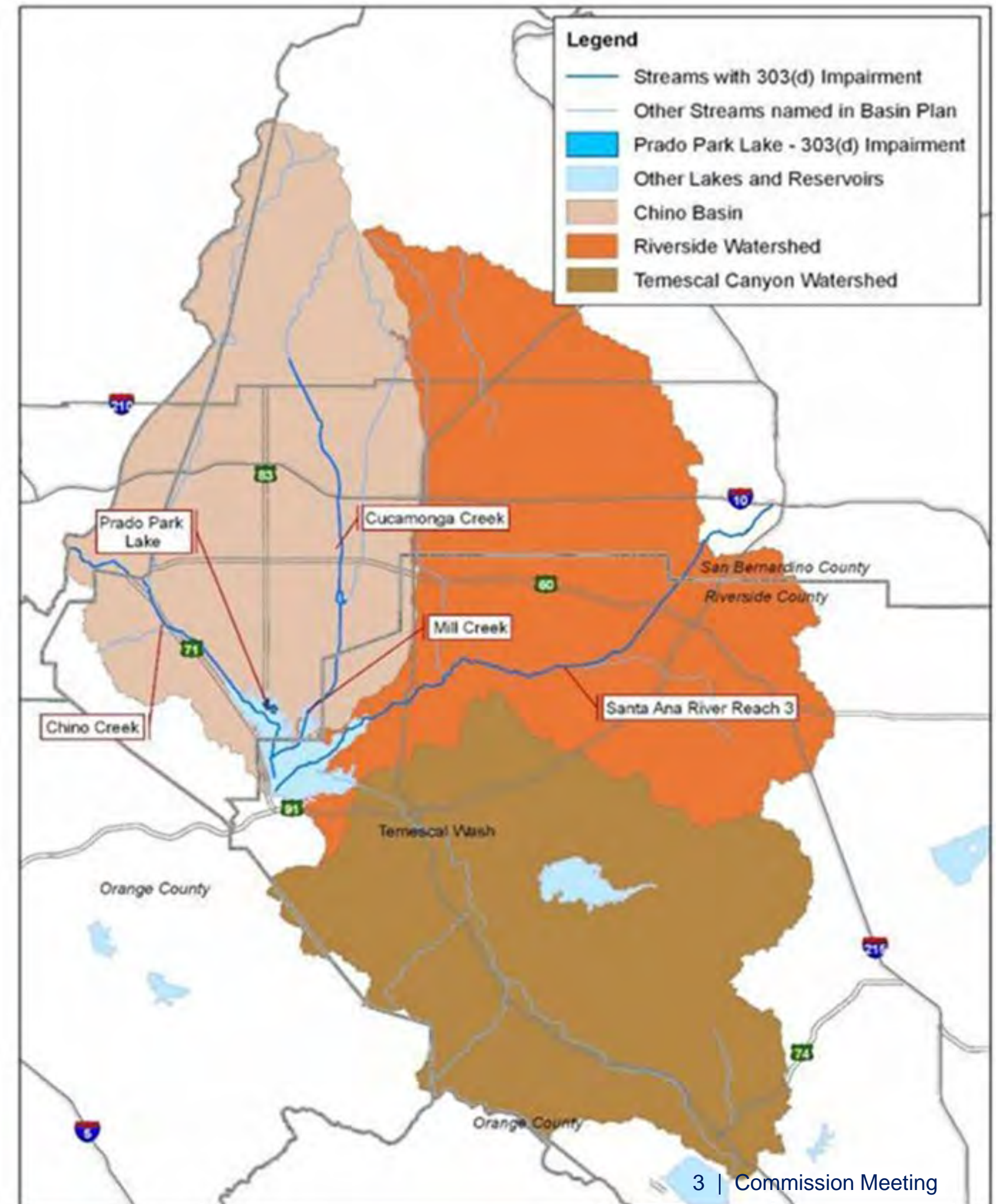
# Recommendation

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- To authorize the approval of Change Order 3 to Task Order GEI384-02 in the amount not-to-exceed \$86,530 with GEI Consultants, Inc. to support the MSAR TMDL Task Force in the preparation of a Basin Plan Amendment (BPA) to complete limited revisions to the MSAR Bacterial Indicator TMDLs.

# Middle Santa Ana River TMDLs

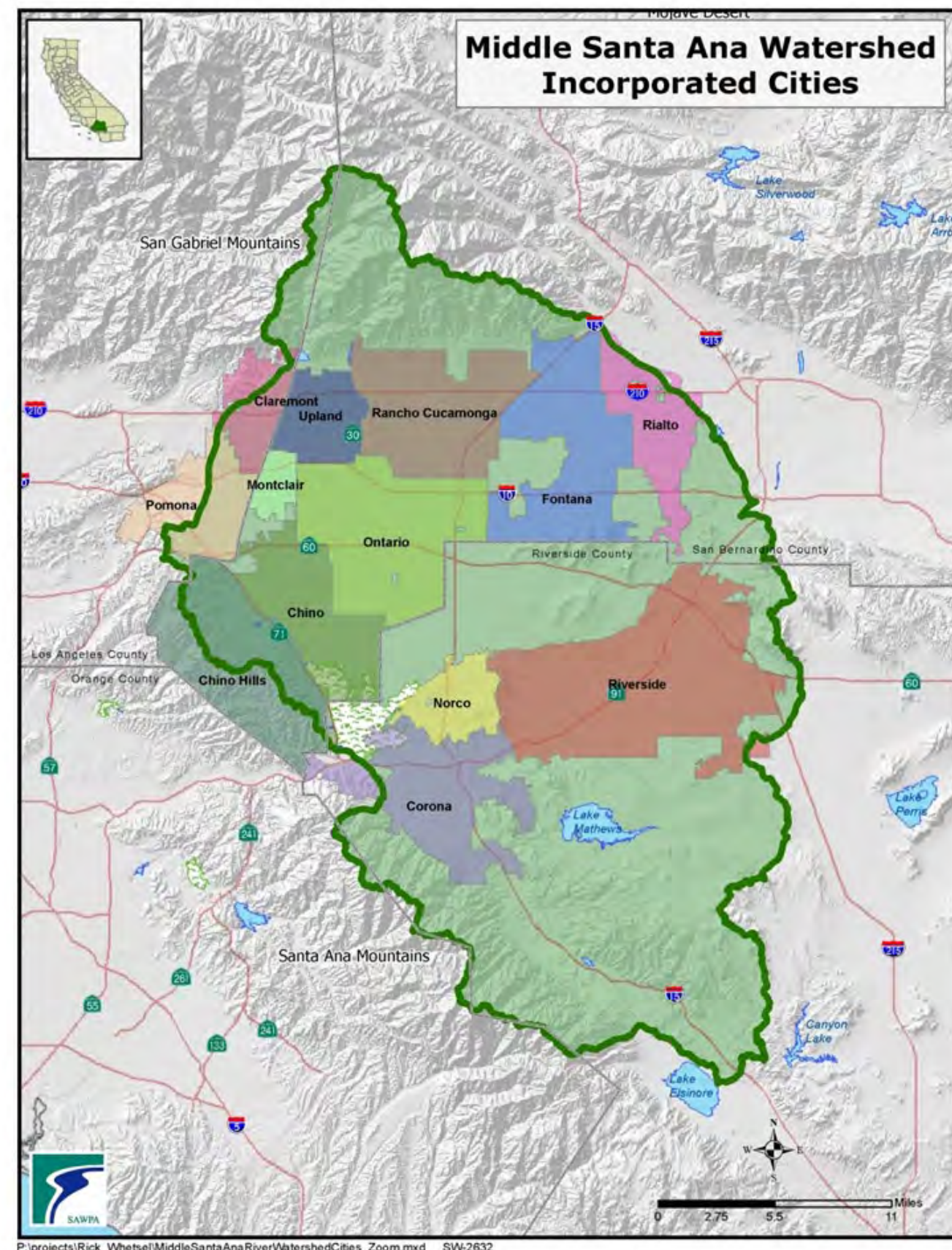
- February 2005, Basin Plan amended to include Bacterial Indicator TMDLs for Middle Santa Ana River Waterbodies
  - Santa Ana River, Reach 3
  - Chino Creek, Reaches 1 and 2
  - Cucamonga Creek, Reach 1
  - Mill Creek (Prado Area)
  - Prado Park Lake
- Key Compliance Dates:
  - December 31, 2015 - compliance with Dry Season TMDLs, wasteload allocations and load allocations.
  - December 31, 2025 - compliance with Wet Season TMDLs, wasteload allocations and load allocations.



# Middle Santa Ana River Bacteria TMDL Task Force Members

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- Formed: August 2005
- Stakeholders:
  - San Bernardino County Flood Control District representing the Cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, Rialto, and Upland
  - County of Riverside
  - City of Claremont
  - City of Corona
  - City of Norco
  - City of Pomona
  - City of Riverside
  - Agricultural Operators represented by Chino Basin Watermaster Agricultural Pool



# Task Force Purpose

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- Implements regulatory requirements of the Middle Santa Ana River Watershed bacteria indicator TMDLs (R8-2005-0001)
  - Investigate Long Term TMDL Implementation Structure, Cost Sharing Formula, and Funding Sources.
  - Implement, report and update a watershed-wide bacterial indicator water quality monitoring program.
  - Implement, report and update bacterial indicator urban source evaluation activities.



# Task Force Benefits

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Supports SAWPA's continuing mission to improve regional water quality



Continues partnership with Santa Ana Regional Board in providing regional facilitation and support services, including assistance to Regional Board with future triennial reviews and future amendments of the Basin Plan



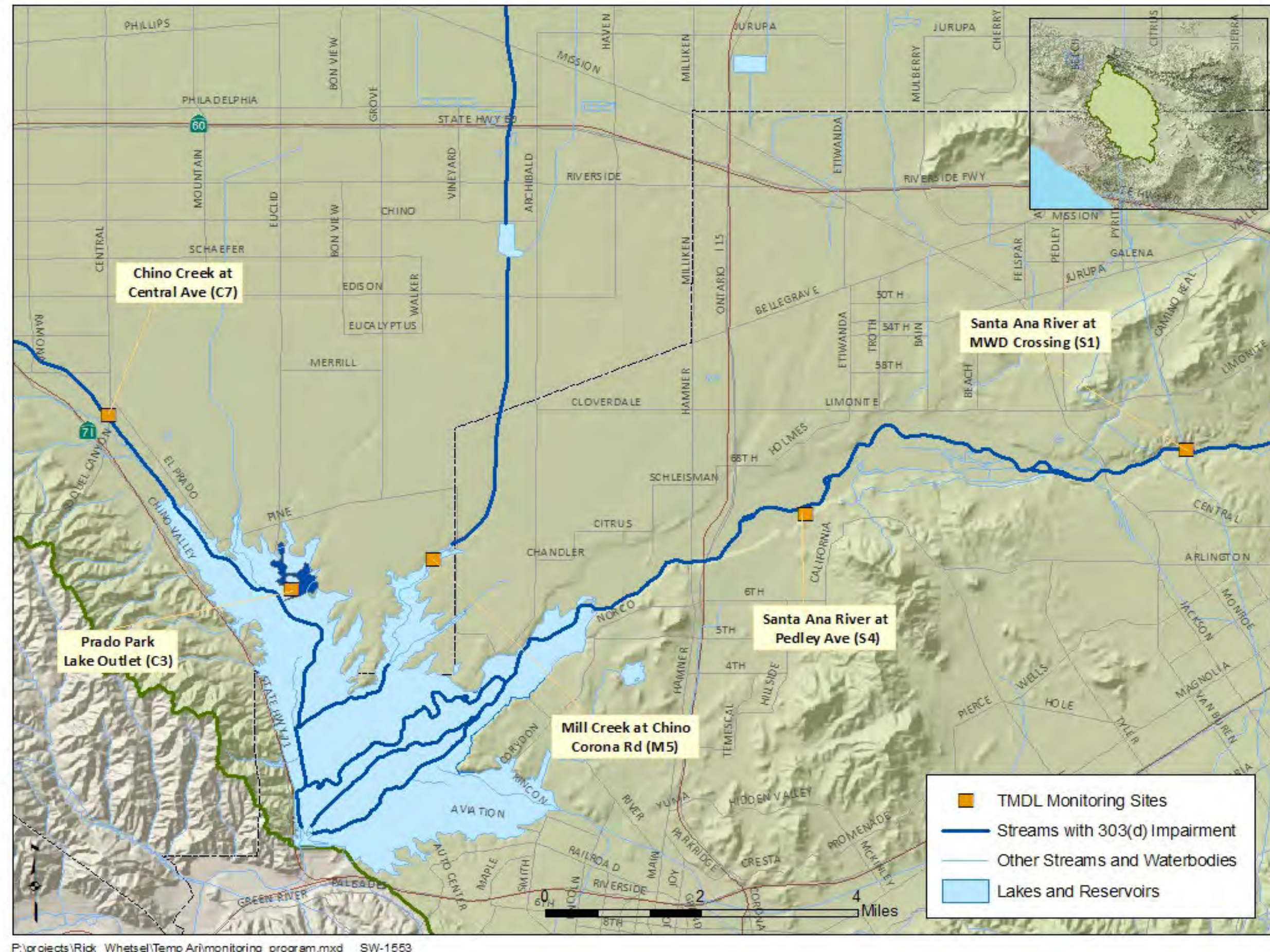
Support watershed stakeholders in addressing regulatory compliance with the Santa Ana River Watershed Basin Plan



Achieves economies of scale for Task Force partners

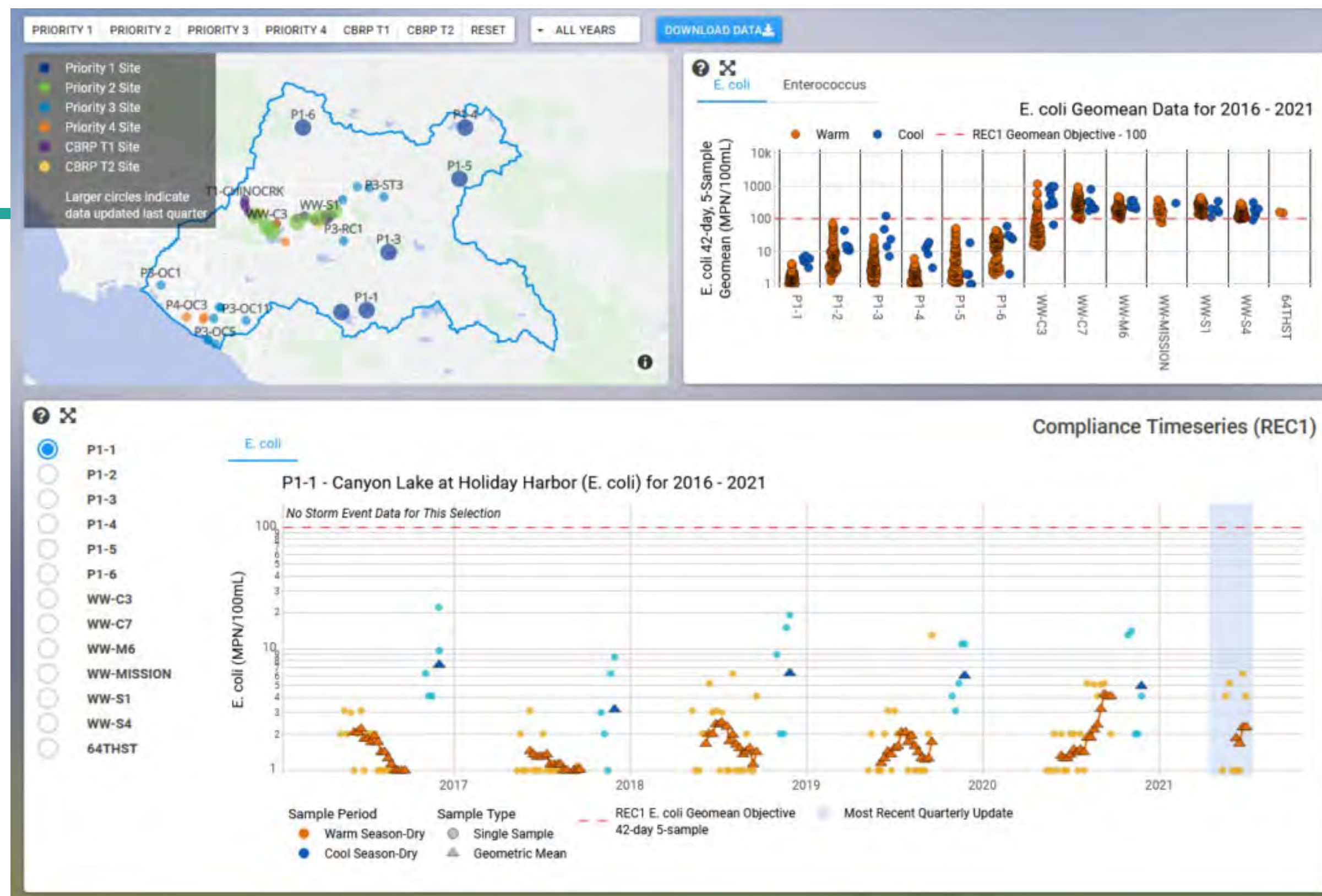
# TMDL Compliance Monitoring and Reporting

- Monitoring Program to measure compliance with numeric TMDL targets
- Conducted as part of the SAR Regional Bacteria Monitoring program (since 2016)
- Five comprehensive monitoring sites (priority 2)
- Dry and Wet season monitoring
  - Laboratory: E. coli, enterococci, and total suspended solids (TSS)
  - Field: temperature, dissolved oxygen, conductivity, turbidity, and pH
- Triennial Reporting on the progress and findings of the MSAR TMDL Task Force



# Program Data Viewer Dashboard

- Replaces tabular reports with online data dashboard
- Includes complete record of regional bacteria data
- Provides robust analyses of the data to demonstrate compliance for stakeholders:
  - Interactive graphical user interface
  - Plots and maps to support analyses of data
  - Updated quarterly



[Go to Data Viewer  
sarwqmdashboard.org](https://sarwqmdashboard.org)



# Support Implementation of Comprehensive Bacteria Reduction Plans

- February 2012: Regional Board adopted Comprehensive Bacteria Reduction Plans (CBRP) for Riverside and San Bernardino Counties
- Plans designed to achieve compliance with dry weather wasteload allocations for bacterial indicators established by the TMDL
- Requires dischargers source evaluation of and implementation of BMPs

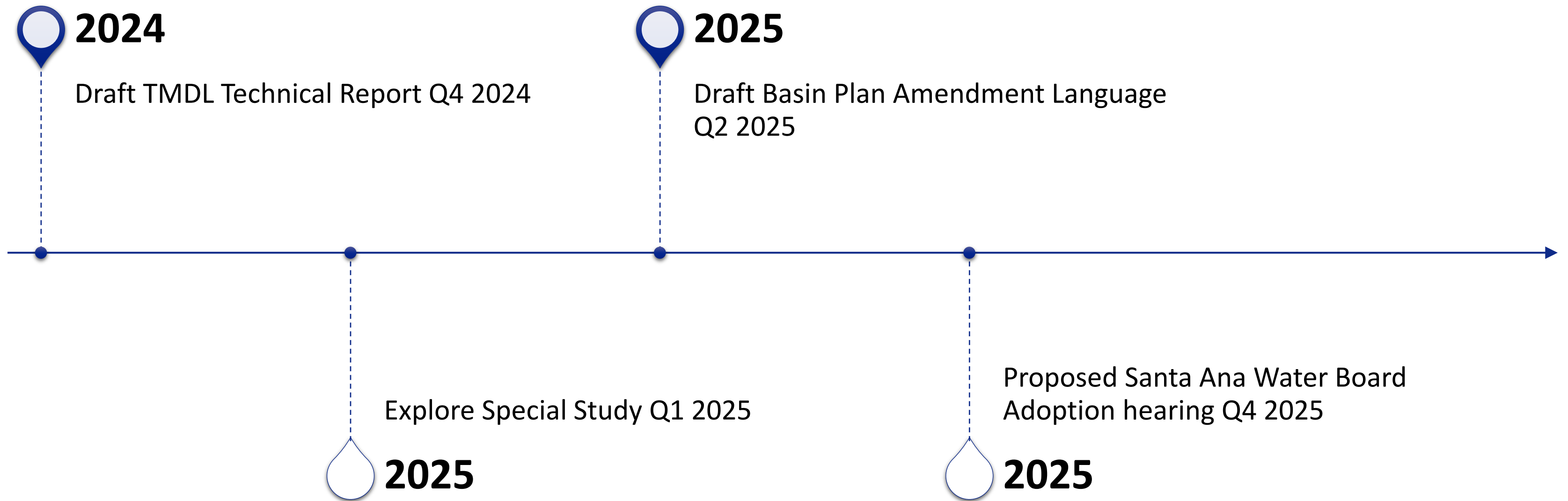


# Consultant Scope of Work

- Prepare:
  - Final Revised Technical Report
  - Supporting Substitute Environmental Document
- Support:
  - Regional Board staff with Basin Plan Amendment Process.
  - MSAR Task Force Meeting Participation
- MSAR Task Force Technical Support (FY 2024-2025)



# TMDL Update Schedule



# Recommendation

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Questions?

# Thank You

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SANTA ANA WATERSHED  
PROJECT AUTHORITY

# Arundo Donax Removal in the Santa Ana River Basin Headwaters Project Update

Commission Meeting  
Item No. 6.B

Ian Achimore, Senior Watershed Manager  
Santa Ana Watershed Project Authority

Aaron Echols, Restoration Ecologist  
Inland Empire Resource Conservation District

November 5, 2024



**Recommendation**

**Receive and file.**



# Overview

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- Purpose:
  - Provide the SAWPA Commission with an update on Arundo Donax Removal in the Santa Ana River Basin Headwaters Project
- Agenda:
  - Background information on Arundo
  - Watershed-wide occurrence
  - Inland Empire Resource Conservation District (IERCD) Project



# Problematic Plant – Arundo Donax

*Arundo donax*, or giant reed

Invasive, non-native plant that provides no habitat benefit

Grows 4 inches per day and up to a total height of 33 feet

Highly flammable

Causes flooding by altering flow regimes

Consumes large volumes of water from Santa Ana River Watershed that could be used downstream



# Estimated Net Water Savings Calculation

**Arundo Water Consumption – Native Vegetation Water Consumption = Water Savings**

- Native vegetation consumes an estimated **4 AFY/acre**.
- Reported Arundo consumption rates have varied across studies
  - Determined through evapotranspiration (ET)\*

\*ET is the process by which water is transferred from the land to the atmosphere by 1) evaporation from the soil, and 2) transpiration from plants. It can be expressed in acre feet (AF), the metric commonly used by water agencies.



# Estimated Net Water Savings Calculation

$$\text{Arundo Water Consumption} - \text{Native Vegetation Water Consumption} = \text{Water Savings}$$

- An early paper used the ET value of **rice** to approximate the ET value for Arundo, resulting in a water consumption rate of **7.7 AFY/acre**
- Two newer studies that used direct measurements of **Southern California Arundo** yielded water consumption rates of **24 AFY/acre**

$$7.7 \text{ AFY/acre} - 4 \text{ AFY/acre} = \mathbf{3.7 \text{ AF/year/acre}} = \text{Water Savings}$$

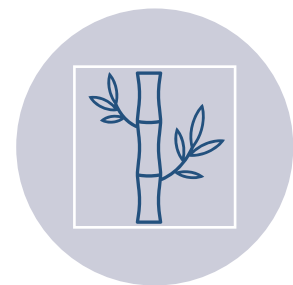
Iverson  
1998

$$24 \text{ AFY/acre} - 4 \text{ AFY/acre} = \mathbf{20 \text{ AF/year/acre}} = \text{Water Savings}$$

Abichandani 2007 &  
Cal-IPC 2011

# Arundo as a Watershed-Wide Issue

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The invasive weed spreads as its rhizomes (subterranean stems) are uprooted and flow downstream in waterways.



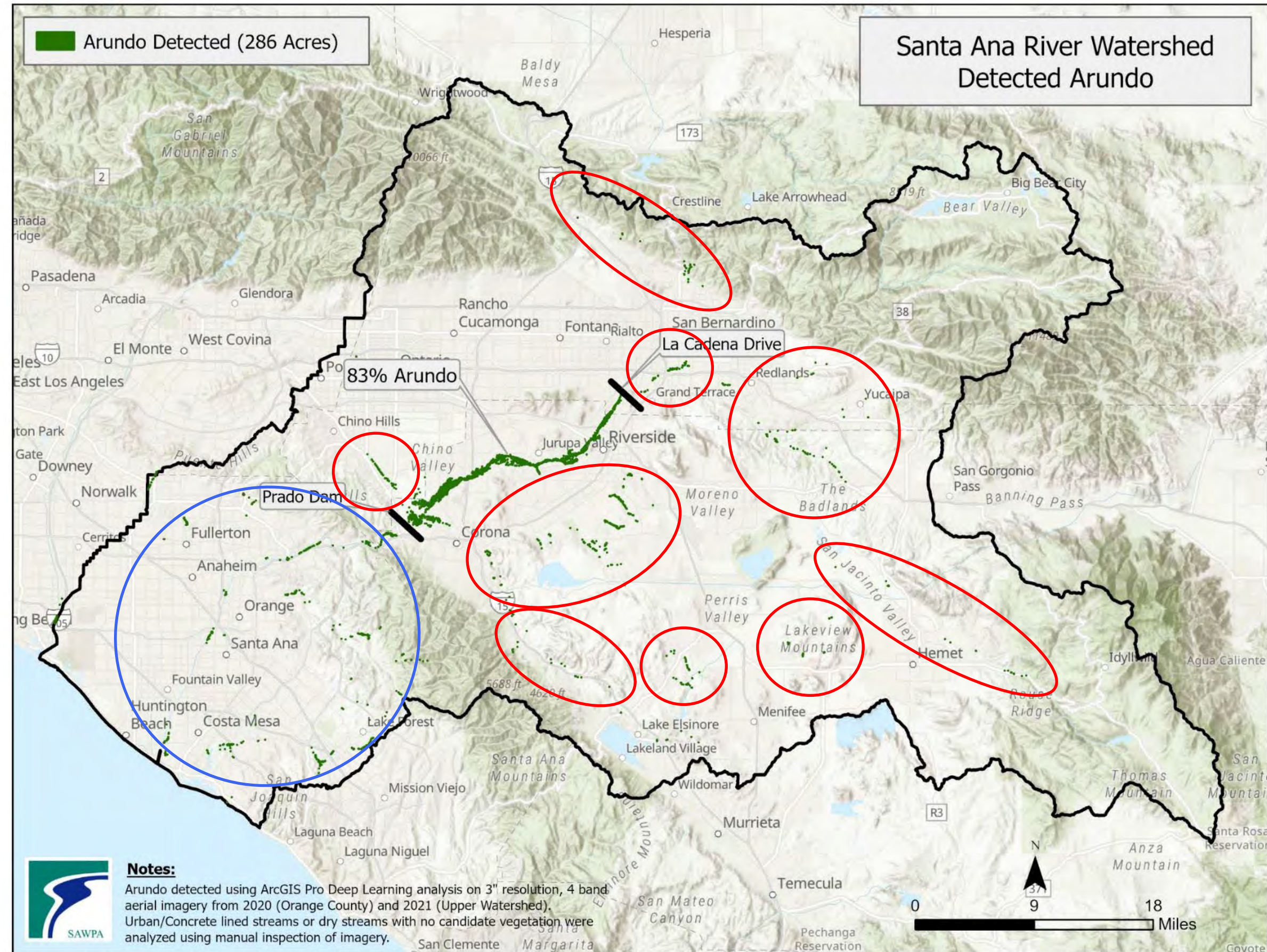
In our watershed's waterways, invasive weeds are largely managed through mitigation-related funding, conservancy organizations, and through property maintenance efforts. But mitigation is dependent on specific projects and conservancies are often focused on specific areas in the Watershed. This leads to "gaps" in waterways where Arundo can gain a foothold.



SAWPA is using deep learning software to determine presence of Arundo (in acres) in the watershed.

# Watershed-Wide Arundo Mapping

- Presented to the Commission on June 18
- Uses 2021 high resolution imagery and a ESRI deep learning imagery analysis
- Most Arundo (83%) in the watershed is upstream of Prado Dam
- Upper watershed Arundo can seed lower watershed areas (**red** circles)
- Arundo occurs in lower watershed (**blue** circle)



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# Arundo Donax Removal in the Santa Ana River Basin Headwaters Project Summary

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- Scope of Project
  - IERCD shall help acquire access, survey for, and perform removals of the noxious weed Arundo donax in the Santa Ana River Basin's headwaters.
  - IERCD shall remove all documented Arundo donax stands within the designated areas, which will occur in the approximately first two years.
  - Treatment locations will be monitored for the three subsequent years following the initial treatment. Re-treatment applications will be conducted if necessary following monitoring of initial treatments within those three subsequent years.
- SAWPA Commission approved a five-year IERCD Task Order on July 19, 2022.

# Project Budget

Time Period	Task Description	Amount
Task 1	Access Agreements, Right of Entry, Encroachment	\$10,775
Task 2	Surveying and Mapping	\$16,357
Task 3	Invasive Species Removal, Herbicide Application, Retreatment, and Restoration	\$107,097
Task 4	Admin - Environmental Review, Project Management, Administration, and Reporting	\$13,547
<b>Total</b>		<b>\$147,777</b>



# Project Budget/Schedule Status

Item	Amount Incurred	% of Schedule/Budget Incurred
<b>Schedule Implemented*</b>	2 of 5.5 years	36%
<b>Budget Utilized</b>	\$70,266 of \$147,777	48%

Task Order is funded using the Arundo Management & Habitat Restoration Project Fund. Fund balance as of July 31, 2024, is \$754,835. Fund gains revenue from credit sales from Santa Ana River Mitigation Bank (not grants or member agency dues).



\*Task Order Term – July 2022 to December 2027 (5.5 years)

# Inland Empire Resource Conservation District (IERCD)

- One of four RCDs in the Santa Ana River Watershed (SARW).
- IERCD service area covers the upper SARW
- Previous IERCD Arundo projects:
  - Mill Creek Spanish Broom Control Project
  - Cajon Pass Invasive Species Control Project.
- IERCD has a detailed invasive species removal plan for their field staff
- Staff are certified by Department of Pesticide Regulation for herbicide application



**INLAND EMPIRE**  
RESOURCE CONSERVATION DISTRICT

Prepared by:  
The Inland Empire Resource Conservation District  
25864 Business Center Dr # K  
Redlands, CA 92374  
(909) 799-7407

# Map of Surveyed Sites

- Surveying completed by IERCD via aerial imagery viewing and/or in-site field visits.



P:\Projects\JeffMoshier\ArundoWatershed\Phase4 IERCD\_Sites\IERCD\_Sites.aprx Layout SW-3350

# Example of Arundo Stands (Group of Canes)

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Most stands encountered are composed of 5 to 20 canes/stalks. A larger stand has been 200 square meters of canes.

# Arundo Sites Surveyed/Removed To Date

Site Name for Surveys	Total Site Size Surveyed (Acres)	Stands Inventoried	Stands Removed	% Stands Removed
Cajon Creek	876	587	40	7%
Coopers Creek	74	0	0	NA
Devore	1,426	19	1	5%
Live Oak Canyon	31	91	91	100%
Lytle Creek	4,361	10	0	0%
Mill Creek	467	14	14	100%
Morey Arroyo	9	11	11	100%
Noble Creek	167	0	0	NA
Palm Canyon	23	0	0	NA
San Timoteo	350	73	73	100%
Santa Ana River Main Stem	2,182	36	36	100%
Waterman, East Twin Creek	141	0	0	NA
Yucaipa Waterways	42	10	10	100%
Zanja	29	6	1	17%
Devil's Canyon	5	17	17	100%
<b>Total</b>	<b>10,183</b>	<b>874</b>	<b>294</b>	<b>34%</b>

# Devore – Before and After



# Devils Canyon – Before and After

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# Live Oak Canyon – Large Arundo Stand

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# IERCD Hauling Arundo Offsite

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# Treated Rhizome Example

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# IERCD Outreach

- Copy of IERCD Letter



- Presentation to Cajon Community

## Why are Invasive Species Bad?

- Ecology – invasive species displace native plants, decreasing diversity. Large invasions create “dead zones”
- Hard to control
- Reduce crop yields
- Etc.



# Lessons Learned (To Date)

- Foliar application\* of herbicide is working efficiently. That removal method has been done more than cutting of canes.
- Right of entry letter requests have been updated/refined to increase participation by landowners.
- There is more Arundo stands in the upper watershed's tributaries than previously thought at the start of this project in 2022.

\*Foliar application is a technique that involves spraying nutrients, boosters, or pesticides directly onto a plant's leaves and stems



# Next Steps

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- Complete sites this season before “wet weather” begins
- Reassess total task order budget after this season to estimate how many project sites can be treated within 5.5-year task order timeline.
- Continually work on access agreements to perform arundo removal at various sites

# Thank You

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