

Summary Annual Budgets: Lake Elsinore & Canyon Lake TMDL Task Force

7/30/2013

Summary Task Force Expenditures

	Approved Budget FY 06 & 07	Actual Expenditures FY 06 & 07	Approved Budget 2007-08	Actual Expenditures 2007-08	Approved Budget 2008-09	Actual Expenditures 2008-09	Approved Budget 2009-10	Actual Expenditures 2009-10	Approved Budget 2010-11	Actual Expenditures 2010-11	Approved Budget 2011-12	Actual Expenditures 2011-12	Approved Budget 2012-13	to date Expenditures 2012-13	Approved Budget 2013-14	to date Expenditures 2013-14
A. Task Force Administration																
LESJWA Staff	98,800.00	88,316.34	65,800.00	76,051.00	85,000.00	94,059.32	85,000.00	127,046.84	85,000.00	108,491.46	100,000.00	111,188.49	50,000.00	50,000.00	50,000.00	
Annual Water Quality Reporting and Database Management	40,000.00	25,000.00	15,000.00	23,916.66	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00						
Grant Preparation		9,790.54			20,000.00											
B. TMDL Compliance Expert (Risk Sciences)	85,000.00	34,841.04	85,000.00	52,906.10	82,880.00	29,130.93	85,000.00	32,171.68	85,000.00	83,566.99	50,000.00	43,800.03	50,000.00	49,088.88	50,000.00	
C. TMDL Monitoring Program																
Phase 1 - Watershed Nutrient Monitoring					50,000.00	37,261.00	60,000.00	59,722.49	157,000.00	58,153.51	70,000.00	47,652.40	70,000.00	42,258.30	70,000.00	
Phase 1 - Watershed Lab Analysis	32,300.00	-	32,300.00										15,000.00	-	15,000.00	
Phase 1 - Canyon Lake Nutrient Monitoring and Lab Analysis			121,100.00	121,078.00	148,549.00	110,021.25	160,000.00	154,124.26	160,000.00	3,228.95	135,000.00	150,000.00				
D. TMDL Implementation Plan Requirements																
Watershed and Canyon Lake and Lake Elsinore In-Lake Modeling Plan	40,000.00	-	-	-	Task Force Admin											
Update Water Quality Models							100,000.00	99,999.82	60,000.00							
Pollutant Trading Options Plan	60,000.00	-	-	-	Task Force Admin											
Pollutant Trading Implementation Plan							80,000.00		80,000.00		50,000.00		60,000.00			
Water Quality Modeling Implementation Plan					40,000.00		40,000.00									
Additional Canyon Lake In-Lake Treatment Modeling					10,000.00	10,000.00										
Canyon Lake Management Plan / Project Alternatives									100,000.00	84,322.00	103,000.00	42,000.00				
Review and Revision of Water Quality Objectives (DO Target Adjustment)															50,000.00	
E. TMDL Implementation Projects																
Canyon Lake Project Alternative (Hybrid Treatment Project)													220,000.00	38,872.71	330,000.00	
F. Additional Studies & Models																
Canyon Lake Pathogen Monitoring **					30,000.00	29,999.90	50,000.00									
Monitoring Study - Local Dry-weather Runoff Flows and Water Quality			40,000.00													
Lake Elsinore Biological Monitoring & Bathymetric Analysis							92,200.00	74,647.39	100,000.00							
G. Contingency (approximately 10% of direct stakeholder expenses)	44,400.00	-	87,500.00		48,143.00		67,500.00		13,500.00				16,000.00		15,000.00	
TOTAL TMDL Implementation Expenditures:	400,500.00	157,947.92	446,700.00	273,951.76	529,572.00	325,472.40	742,500.00	562,712.48	855,500.00	352,762.91	508,000.00	394,640.92	481,000.00	180,219.89	580,000.00	-
Open Task Orders:																
Stakeholder Cash Contributions:		400,500.00		446,700.00		451,335.00		433,093.16		447,176.80		379,290.00		141,611.00		-
Balance TMDL Implementation Budget:		242,552.08		172,748.24		125,862.60		(129,619.32)		94,413.88		(15,350.92)		(38,608.89)		0.00
Previous Year Reserve Carryover:		-na-		242,552.08		415,300.32		541,162.92		411,543.60		505,957.48		289,279.02		250,670.13
Cummulative Carryover:		242,552.08		415,300.32		541,162.92		411,543.60		505,957.48		490,606.56		250,670.13		250,670.13

NEW TASK FORCE AGREEMENT

Detailed Stakeholder Contributions***

	Approved Budget FY 06 & 07	Actual Contributions FY 06 & 07	Approved Budget 2007-08	Actual Contributions 2007-08	Approved Budget 2008-09	Actual Contributions 2008-09	Approved Budget 2009-10	Actual Contributions 2009-10	Approved Budget 2010-11	Actual Contributions 2010-11	Approved Budget 2011-12	Actual Contributions 2011-12	Approved Budget 2012-13	to date Contributions 2012-13	Approved Budget 2013-14	to date Contributions 2013-14
Stakeholder Allocation																
A. MS4 Co-Permittees (Total)	86,400.00	86,400.00	141,011.00	141,011.00	173,312.70	173,314.00	230,919.89	230,920.36	221,588.40	221,588.40	183,139.00	183,139.00	63,970.92	63,972.00	354,359.36	cr \$ 33,671.00
Riverside County	28,591.14	28,591.14	46,663.00	46,663.00	57,351.94	57,352.00	76,415.08	76,415.08	39,829.77	39,829.77	32,919.00	32,919.00	-na-	-na-	33,900.64	
City of Beaumont	1,474.09	1,474.09	2,406.00	2,406.00	2,956.93	2,957.00	3,939.79	3,940.00	4,719.53	4,719.53	3,900.00	3,900.00	1,864.55	1,865.00	19,706.00	
City of Canyon Lake	1,829.75	1,829.75	2,986.00	2,986.00	3,670.35	3,670.00	4,890.34	4,890.00	4,109.46	4,109.46	3,396.00	3,396.00	643.66	644.00	18,774.44	
City of Hemet	11,120.85	11,120.85	18,150.00	18,150.00	22,307.68	22,308.00	29,722.51	29,723.00	27,460.77	27,460.77	22,696.00	22,696.00	6,285.50	6,286.00	20,750.00	
City of Lake Elsinore	3,862.05	3,862.05	6,303.00	6,303.00	7,747.03	7,747.00	10,322.05	10,322.00	14,595.08	14,595.08	12,063.00	12,063.00	-na-	-na-	20,750.00	
City of Moreno Valley	25,243.87	25,243.87	41,200.00	41,200.00	50,637.54	50,638.00	67,468.89	67,469.00	63,546.31	63,546.31	52,520.00	52,520.00	15,425.27	15,425.00	109,525.00	
City of Murrieta	1,000.00	1,000.00	1,632.00	1,632.00	2,005.93	2,006.00	2,672.68	2,673.00	786.96	786.96	650.00	650.00	-na-	-na-	12,500.00	
City of Perris	7,477.62	7,477.62	12,204.00	12,204.00	14,999.61	15,000.00	19,985.31	19,985.00	20,060.94	20,060.94	16,580.00	16,580.00	5,751.56	5,752.00	20,750.00	
City of Riverside	1,032.25	1,032.25	1,685.00	1,685.00	2,070.63	2,071.00	2,758.88	2,759.00	3,587.28	3,587.28	2,965.00	2,965.00	1,575.46	1,575.00	17,977.00	
City of San Jacinto	4,768.38	4,768.38	7,782.00	7,782.00	9,565.05	9,565.00	12,744.36	12,744.36	13,470.59	13,470.59	11,133.00	11,133.00	4,315.45	4,315.00	20,750.00	
City of Menifee									24,752.77	24,752.77	20,458.00	20,458.00	23,648.77	23,649.00	46,476.28	
City of Wildomar									4,668.93	4,668.93	3,859.00	3,859.00	4,460.69	4,461.00	12,500.00	cr \$ 4,193.00
B. Riverside County Flood Control & Water Conservation District (RCFC&WCD)																
C. Lake Elsinore Comprehensive Water Management Agreement (Total)	12,000.00	12,000.00	14,712.00	14,712.00	27,312.70	27,312.00	114,919.89	114,920.00	150,588.40	150,588.40	122,140.00	122,140.00				
Elsinore Valley Municipal Water District (EVMWD)	6,000.00	6,000.00	7,356.00	7,356.00	13,656.35	13,656.00	57,459.94	57,460.00	75,294.20	75,294.20	61,070.00	61,070.00	-na-	-na-	12,500.00	
City of Lake Elsinore	6,000.00	6,000.00	7,356.00	7,356.00	13,656.35	13,656.00	57,459.94	57,460.00	75,294.20	75,294.20	61,070.00	61,070.00	-na-	-na-	-na-	
D. San Jacinto Agricultural Operators	193,200.00	193,200.00	205,010.00	205,010.00	237,312.70	159,075.00	294,919.89	-	300,588.40	-	143,320.00	24,011.00	28,278.01	28,278.00	12,500.00	
E. San Jacinto Dairy & CAFO Operators	33,900.00	33,900.00	35,967.00	35,967.00	41,633.81	41,634.00	37,252.80	37,252.80	37,969.20	25,000.00	10,000.00	-	10,211.35	10,211.00	12,500.00	
F. CALTRANS - freeway	15,000.00	15,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	13,050.00	-	12,500.00	
G. CA DF&G - San Jacinto Wetlands	15,000.00	15,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	13,050.00	-	12,500.00	
H. US Forest Service (USFS)	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-	-na-
I. Eastern Municipal Water District	15,000.00	15,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	13,050.00	13,050.00	12,500.00	
J. March Air Reserve Base Joint Powers Authority	15,000.00	15,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	13,050.00	13,050.00	12,500.00	
K. US Air Force (March Air Reserve Base)	15,000.00	15,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	13,050.00	13,050.00	12,500.00	
Total Funding Required	400,500.00	400,500.00	446,700.00	446,700.00	529,571.90	451,335.00	742,500.00	433,093.16	760,734.39	447,176.80	508,599.00	379,290.00	167,710.28	141,611.00	454,359.36	

NEW TASK FORCE AGREEMENT

NOTES:

- ** Note: Pathogen monitoring for Canyon Lake is a voluntary response by participants of the Lake Elsinore and Canyon Lake TMDL Task Force to address water quality beyond the scope of the Lake Elsinore and Canyon Lake nutrient TMDLs. This program designed to monitor pathogen compliance for Canyon Lake will continue only until the next CWA 303(d) Listing Cycle.
- *** Note: Allocations reflect outside stakeholder funding
- Paid Stakeholder Contribution
- Partially Paid Stakeholder Contribution
- Unpaid Stakeholder Contribution
- Revised Stakeholder Allocation
- Work NOT Conducted by Task Force
- Expenditures (not budgeted in current year)
- Open Task Order
- Actual Stakeholder \$ Funding Credit (Approved)

Detailed Outside Stakeholder Contributions

Approved Budget FY 06 & 07 Actual Expenditures FY 06 & 07 Approved Budget 2007-08 Actual Expenditures 2007-08 Approved Budget 2008-09 Actual Expenditures 2008-09 Approved Budget 2009-10 Actual Expenditures 2009-10 Approved Budget 2010-11 Actual Expenditures 2010-11 Approved Budget 2011-12 Actual Expenditures 2011-12 Approved Budget 2012-13 Actual Expenditures 2012-13 Approved Budget 2013-14 Actual Expenditures 2013-14 ^{7/30/2013} Approved Budget 2013-14 Actual Expenditures 2013-14

Stakeholder Funding \$ Credits (estimated costs reflected in stakeholder allocation)

	Approved Budget FY 06 & 07	Actual Expenditures FY 06 & 07	Approved Budget 2007-08	Actual Expenditures 2007-08	Approved Budget 2008-09	Actual Expenditures 2008-09	Approved Budget 2009-10	Actual Expenditures 2009-10	Approved Budget 2010-11	Actual Expenditures 2010-11	Approved Budget 2011-12	Actual Expenditures 2011-12	Approved Budget 2012-13	Actual Expenditures 2012-13	Approved Budget 2013-14	Actual Expenditures 2013-14	^{7/30/2013} Approved Budget 2013-14	Actual Expenditures 2013-14
A MS4 Funding Credits (RCFC&WCD)	106,767.00	97,054.15	64,000.00	77,653.37	64,000.00	70,597.50	64,000.00	69,824.00	79,000.00	81,344.00	79,000.00	75,690.00						
Phase 1 - Watershed-wide Monitoring (Lab Analysis)	10,767.00	1,054.15	-	13,653.37	-	6,597.50	-	5,824.00	15,000.00	17,344.00	15,000.00	11,690.00						
Phase 1 - Stream gauge O&M	96,000.00	96,000.00	64,000.00	64,000.00	64,000.00	64,000.00	64,000.00	64,000.00	64,000.00	64,000.00	64,000.00	64,000.00						
Wet Year Watershed-wide Monitoring (Weather Dependant)	-	-	-	-	-	-	-	-	-	-	-	-						
B Lk Elsinore Comp Water Mgt Agrmt Funding Credits (EVMWD)	181,175.00	129,216.12	190,300.00	167,028.48	210,000.00	262,111.63	180,000.00	149,390.89	150,000.00	97,376.65	140,000.00	85,992.59						
Phase 1 - Lake Elsinore Nutrient Monitoring (MWH/CSUSB)	144,375.00	112,212.77	148,600.00	148,578.00	168,300.00	150,488.17	180,000.00	149,390.89	150,000.00	97,376.65	140,000.00	85,992.59						
In-Lake Sediment Reduction Plan (MWH/Horne)	-	17,003.35	-	18,450.48	-	111,623.46	-	-	-	-	-	-						
In-Lake Project Evaluation	19,900.00	-	20,000.00	-	20,000.00	-	-	-	-	-	-	-						
In-Lake Sediment Reduction Plan	16,900.00	-	16,900.00	-	16,900.00	-	-	-	-	-	-	-						
Sediment Treatment Study	-	-	4,800.00	-	4,800.00	-	-	-	-	-	-	-						
C Dairy/Agricultural Operator Funding Credits (WRCAC)	-	-	-	101,858.09	-	-	-	19,338.81	-	-	-	-						
Aerial Mapping/Identification of Agricultural Operations	-	-	-	79,361.39	-	-	-	19,338.81	-	-	-	-						
Upper Watershed Nutrient Monitoring (dairy/agriculture split 50/50)	-	-	-	22,496.70	-	-	-	-	-	-	-	-						
CA Fish & Game Credit Transfer	-	-	-	-	-	-	-	-	-	-	-	-						
Total Stakeholder Credits	287,942.00	226,270.27	254,300.00	346,539.94	274,000.00	332,709.13	244,000.00	238,553.70	229,000.00	178,720.65	219,000.00	161,682.59						
In-Kind Services Share (costs not reimbursed to stakeholder)	-	-	-	-	-	-	-	-	-	-	-	-						
A LE & CL Nutrient TMDL Monitoring Plan (LESJWA)	-	34,624.00	-	-	-	-	-	-	-	-	-	-						
B TMDL Compliance Expert (RCFC&WCD)	25,000.00	25,000.00	-	-	-	-	-	-	-	-	-	-						
C Phase 2 - Stream Gauge O&M (RCFC&WCD)	154,000.00	-	77,000.00	-	77,000.00	-	77,000.00	-	77,000.00	-	77,000.00	-						
D S.B. Forest Natural Background Study (USFS)	15,000.00	-	10,000.00	-	10,000.00	-	10,000.00	-	10,000.00	-	10,000.00	-						
E Pathogen Monitoring Funding (Regional Board)	-	-	-	-	10,000.00	-	-	-	-	-	-	-						
Total Stakeholder In-Kind Services	194,000.00	59,624.00	87,000.00	-	97,000.00	-	87,000.00	-	87,000.00	-	87,000.00	-						
Grant Funding																		
A Prop 50 Planning Grant (SJWRC)	-	85,400.00	18,000.00	18,000.00	-	-	-	-	-	-	-	-						
Canyon Lake Nutrient TMDL Monitoring (2006-07)	-	41,708.00	-	-	-	-	-	-	-	-	-	-						
Canyon Lake Nutrient Flux and Oxygen Demand Study	-	43,692.00	-	-	-	-	-	-	-	-	-	-						
Canyon Lake Alternatives Modeling study	-	-	18,000.00	18,000.00	-	-	-	-	-	-	-	-						
B Agriculture (UCR) Agricultural Management Study	-	-	-	-	-	-	-	-	-	-	-	-						
C Prop 40 Implementation Grant (LESJWA)	-	18,022.39	-	1,471,956.12	-	65,000.81	-	71,116.20	-	314,015.78	-	329,898.76						
Lake Elsinore - Back Basin Wetlands Enhancements	-	8,020.52	-	90,568.29	-	51,905.37	-	36,285.45	-	17,511.86	-	329,898.76						
Lk Elsinore Comp Water Mgt (EVMWD) (Recharge Pipeline Project)	-	10,001.87	-	1,381,387.83	-	13,095.44	-	34,830.75	-	296,503.92	-	-						
Lake Elsinore - Biological Performance Monitoring	-	-	-	-	-	-	-	-	-	-	-	-						
D Prop 84 Alum Application Grant (LESJWA)	-	-	-	-	-	-	-	-	-	-	-	-			250,000.00			
Total Grant Funding	-	103,422.39	18,000.00	1,489,956.12	-	65,000.81	-	71,116.20	-	314,015.78	-	329,898.76			250,000.00			

NEW TASK FORCE AGREEMENT

NOTES:

Stakeholder Contributions estimated as follows:
 PRO-RATA SHARE for stakeholders are derived from a formula where the the cost share to MS4 CO-PERMITTEES is 28.5%, Agricultural Operators is 28.5%, EVMWD is 14.25%, the CITY OF LAKE ELSINORE is 14.25% (plus an allocation under MS4), and Dairy is 5% of the TOTAL TMDL Implementation Expenditures minus the fixed cost shares of CALTRANS, CA DF&G, USFS, EMWD, US Air Force (March Air Reserve Base), and the March Air Reserve Base Joint Powers Authority MINUS any Stakeholder Funding \$ Credits provided by that stakeholder.



6 June 2013

Rick Whetsel
Lake Elsinore - San Jacinto Watersheds Authority
11615 Sterling Ave.
Riverside, CA 92503

RE: Proposed Scope-of-Work for LECL TMDL Task Force in 2013-14

Dear Mr. Whetsel:

Per your request, I have prepared the following preliminary scope of work and cost estimate to support the Lake Elsinore/Canyon Lake TMDL Task Force in FY2013-14. In the coming year, most of our effort will be devoted to three large tasks:

- 1) Obtain approval of the CNRP/AgNMP (extended from FY2012-13)
- 2) Negotiate the BMP implementation agreements for both Canyon Lake and Lake Elsinore (extended from FY2012-13)
- 3) Develop a water quality monitoring plan to demonstrate the effectiveness of all in-lake nutrient control projects (coordinated with CDM-Smith).

As in the past, my role will be to serve as regulatory strategist and compliance expert for the Task Force. To accomplish these ends, I will prepare for and participate in up to eight meetings of the Technical Advisory Committee (TAC) and/or Task Force to review and revised the various regulatory implementation strategies as necessary to assure compliance with the TMDL. A summary task schedule is shown in Table 1.

Table 1: Task Summary for 2013-14

Task	Description	Due Date
1	Assist in obtaining Regional Board approval of the CNRP and AgNMP.	Oct., 2013
2	Prepare and revise cost allocation and credit sharing agreements to support development of BMP implementation projects.	Mar., 2014
3	Develop water quality monitoring plan to evaluate effectiveness of the in-lake nutrient control projects (e.g. aeration and alum).	Aug., 2013
4	Task Force & TAC Meetings (up to 8 trips)	To Be Scheduled

I estimate that meeting the proposed schedule will require approximately 12 hours per month. My professional fee is \$285 per hour plus travel expenses. All other direct expenses (telecommunications, postage, photocopies, etc.) are already included in the fee. The total estimated cost, including travel, is shown in Table 2 and is approximately \$1,000 less than our current contract for FY2012-13.

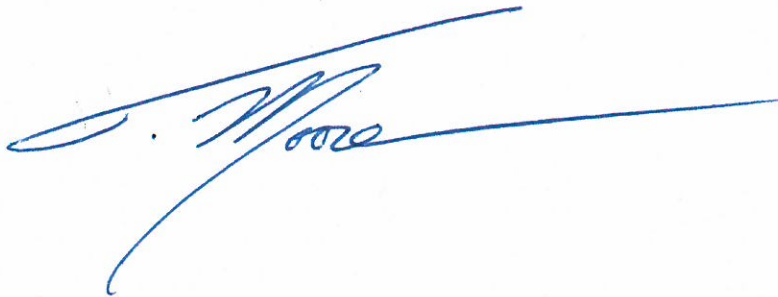
Table 2: Proposed Compensation for 2013-14

Description	Amount
Professional Fees (144 hours)	\$41,040
Travel Expenses (8 trips * \$950/trip)*	\$7,600
Total	\$48,640

*Trip expenses are routinely shared among multiple clients to minimize costs. The estimate is based on the historical average cost for previous travel on behalf of the LE/CL Task Force.

I appreciate the opportunity to continue supporting with the Lake Elsinore/Canyon Lake TMDL Task Force and look forward to working together next year.

Respectfully submitted,



Timothy F. Moore

Risk Sciences
125 New Dawn Rd.
Rockvale, TN 37153

Phone: 615-274-2745
Fax: 615-370-5188
Email: tmoore@risk-sciences.com

Suggestions for additional studies

- 1) Perform statistical analyses on water quality data generated for Lake Elsinore and Canyon Lake to evaluate how chlorophyll a levels and dissolved oxygen are related to TP and TN concentrations, lake level or other factors (requested by Hope Smythe).
- 2) Conduct scientific study to document the magnitude of offset credit that should be associated with fish stocking in Lake Elsinore, similar to the evidence that we have put together for the carp removal program to validate nutrient credits.
- 3) Conduct scientific study for Lake Elsinore to quantify a translator between supplemental water additions and equivalent nutrient reduction credits.
- 4) Submit revised comprehensive watershed and in-lake monitoring program by December 31, 2014 for implementation in fiscal year 2015-2016.
- 5) Review and revise the DO water quality target set for the TMDL.
- 6) Review and revise TMDL



Comprehensive Nutrient Reduction Plan

Jason Uhley

Chief of Watershed Protection

Riverside County Flood Control
and Water Conservation District

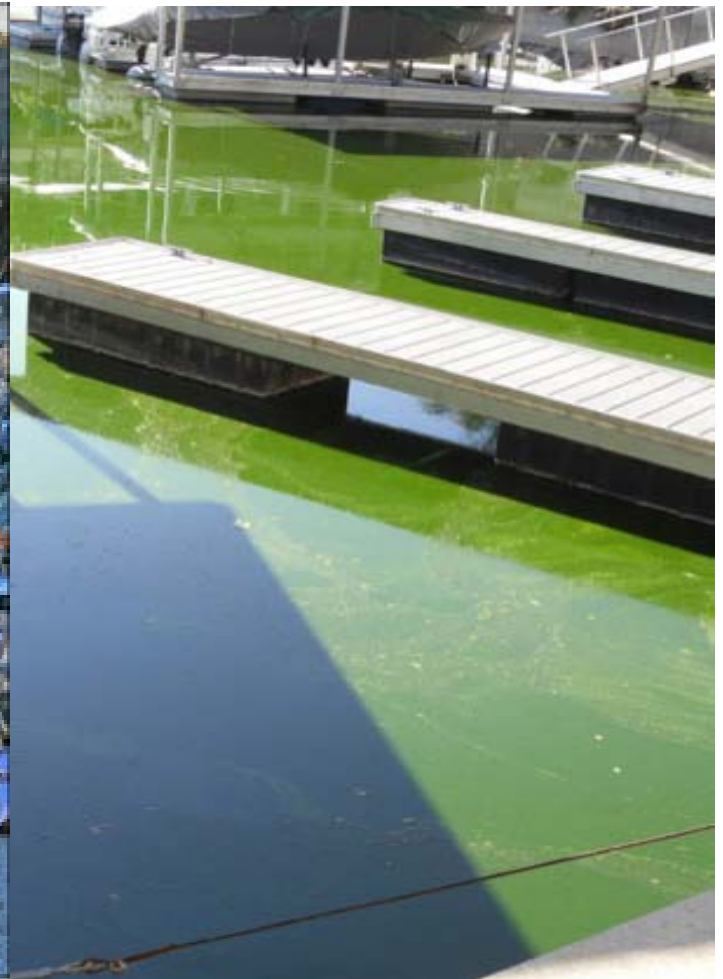




Background
Activity to Date
Next Steps
Questions



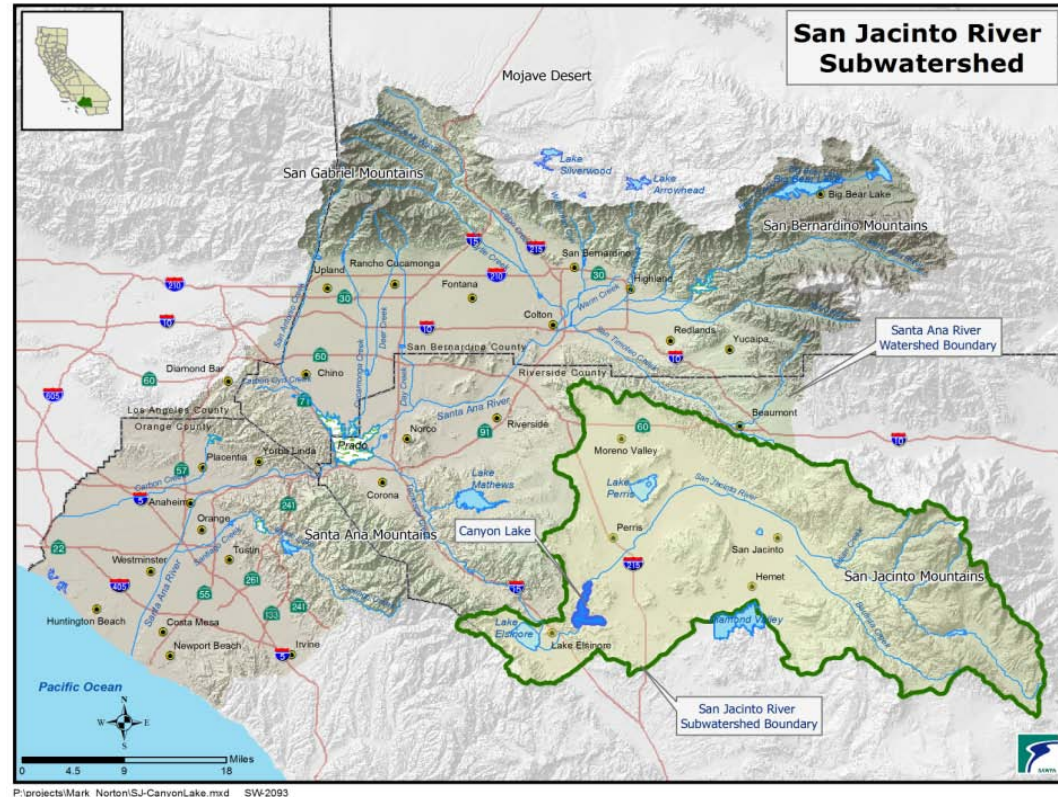
Background – Cause and Effect



Background – Source

Common Nutrient Sources

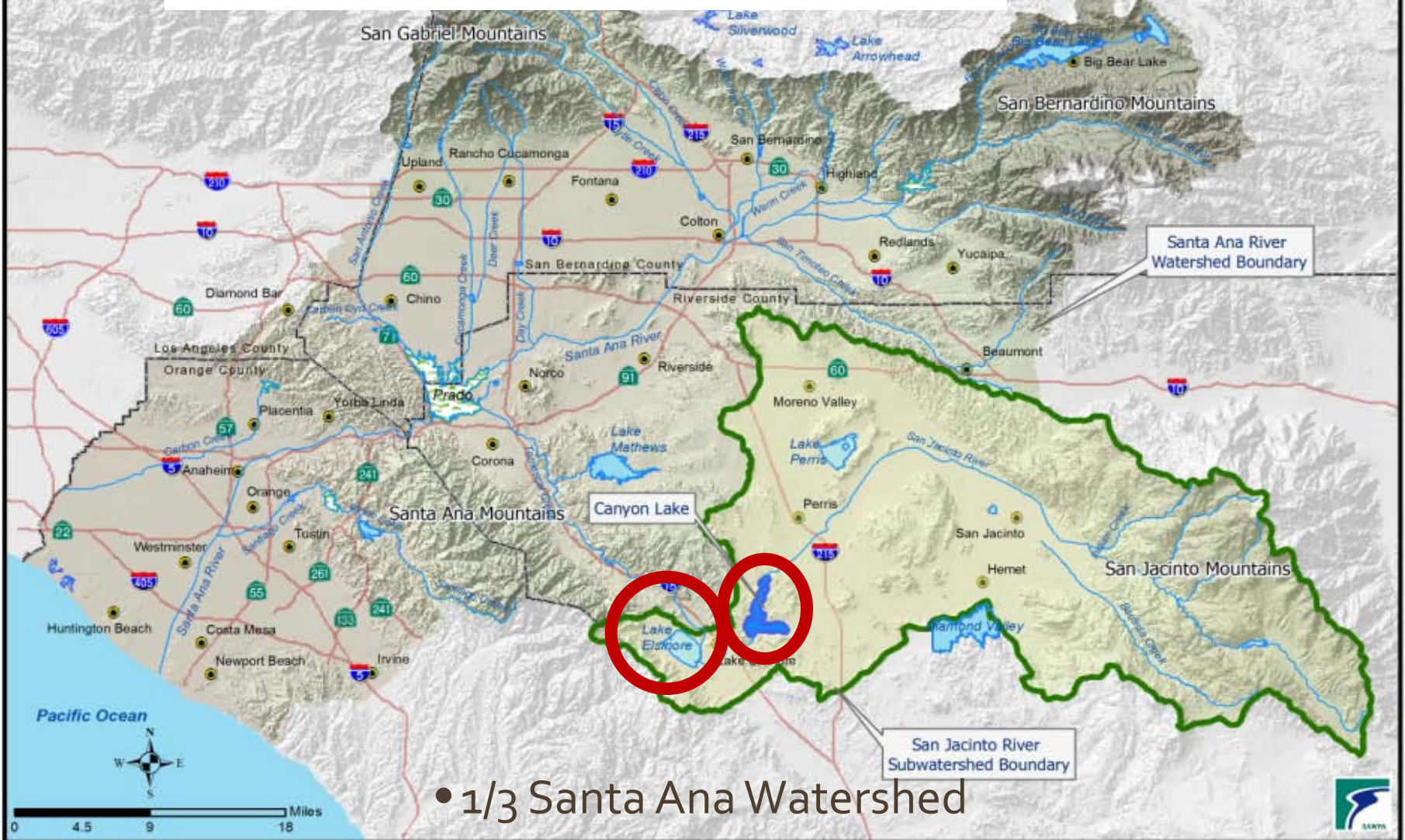
- Excessive fertilizer use
- Improper yard waste disposal
- Pet waste
- Detergents
- Leaking septic
- Agriculture/Dairies
- Natural sources (wildlife, vegetation, atmosphere)





Background – Pollutant Transport

San Jacinto River Subwatershed



• 1/3 Santa Ana Watershed



VOLUME: The impediment to compliance

The “BIG” Storm



January 1993 – 10"/10 days

December 2010 – 7"/ 8 days

- Peak rainfall 3"/day
- Minimum 4,000 acres set aside within urban area for treatment
- Equivalent to a “NEW” Lake Elsinore
- **Billion dollar solution + O&M**
- Needed once every 20 years

Background- Naturally Achievable?

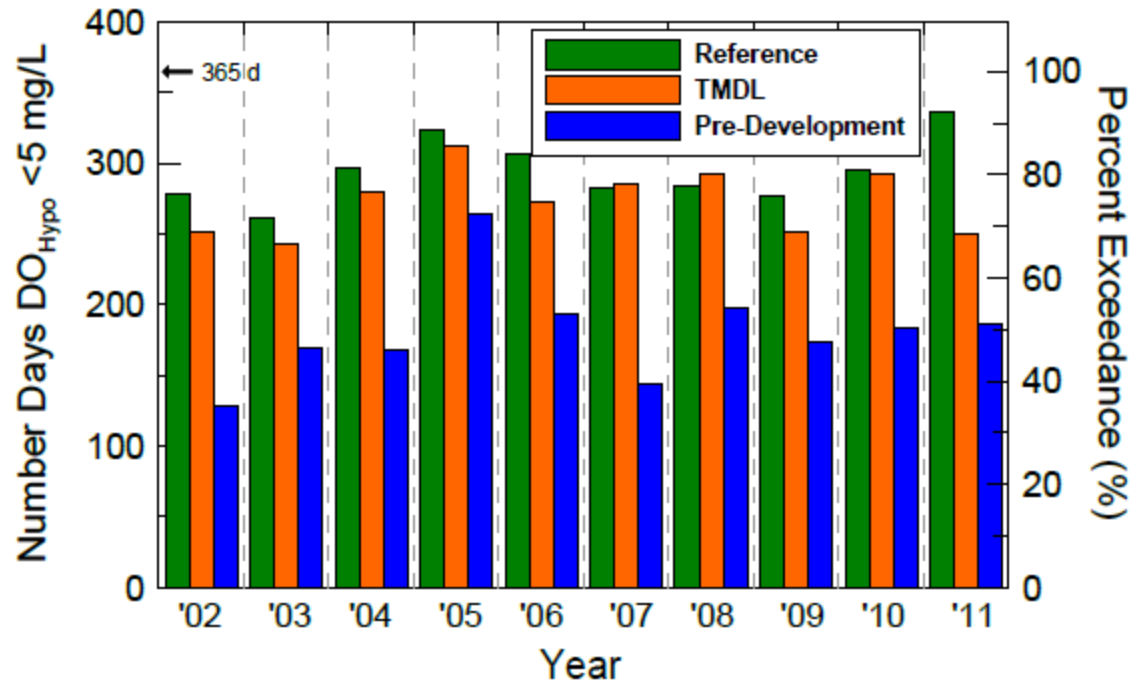


Fig. 8. Number of days each year when hypolimnetic DO concentrations were below the TMDL target of 5 mg/L under the reference (existing) condition, TMDL-prescribed reductions in external loading, and the pre-development scenario.

Canyon Lake

- Deep Main Body

- Shallow East Bay



Canyon Lake

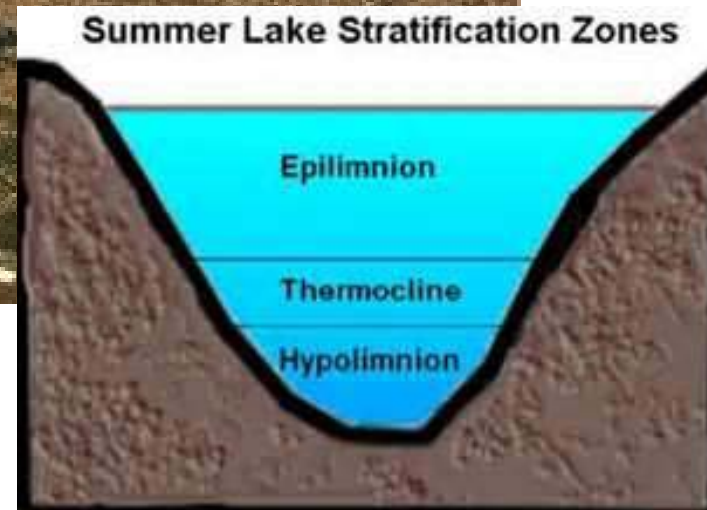
- Deep Main Body

- Shallow East Bay



Canyon Lake

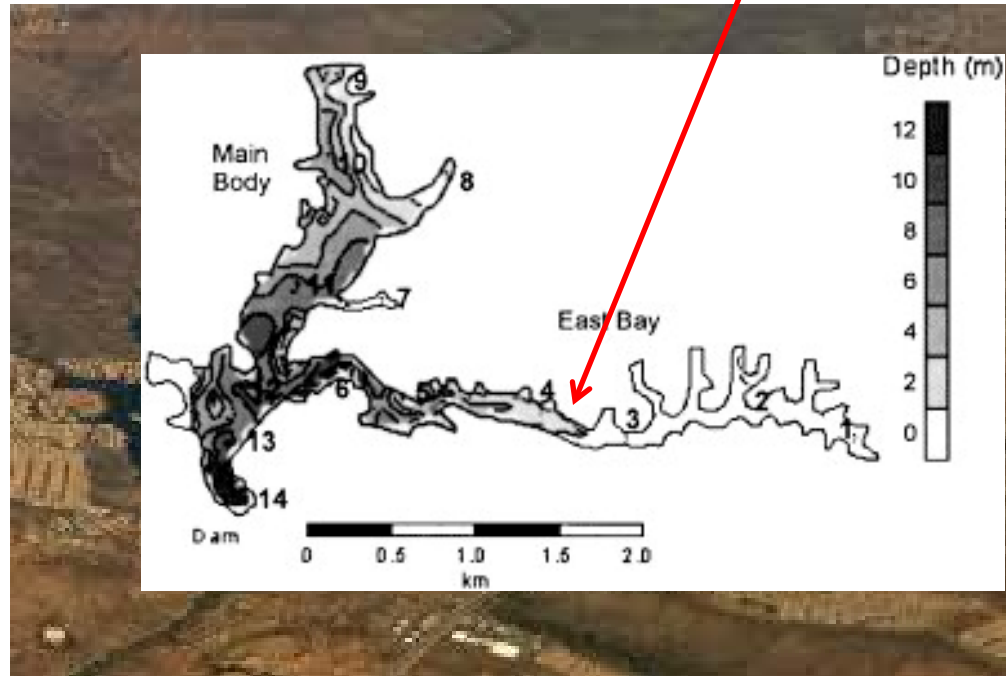
- Deep Main Body
 - Low Oxygen in deep water
 - Sediment Nutrient Cycling
 - Algal Blooms



Canyon Lake

- Deep Main Body
 - Low Oxygen in deep water
 - Sediment Nutrient Cycling
 - Algal Blooms

- Shallow East Bay
 - Good Oxygen
 - Algal Blooms



Lake Elsinore



Canyon Lake Spillway

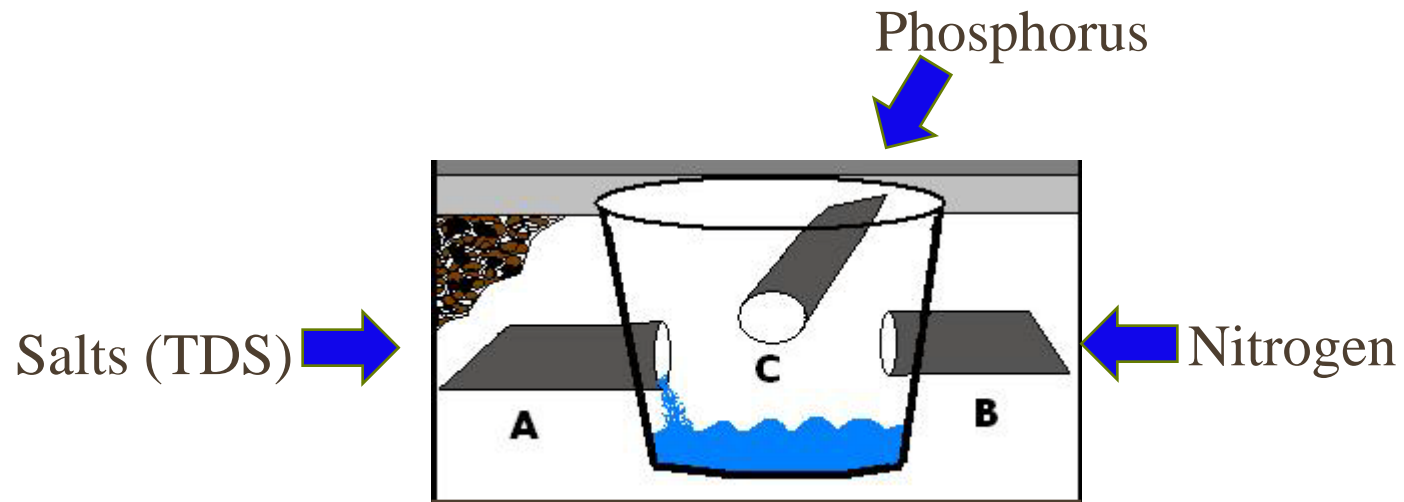
Lake Elsinore – Dry Lake Bed - 1950's, 1960's



- Evaporation Rate = 6 Feet per year



Lake Elsinore - Sump

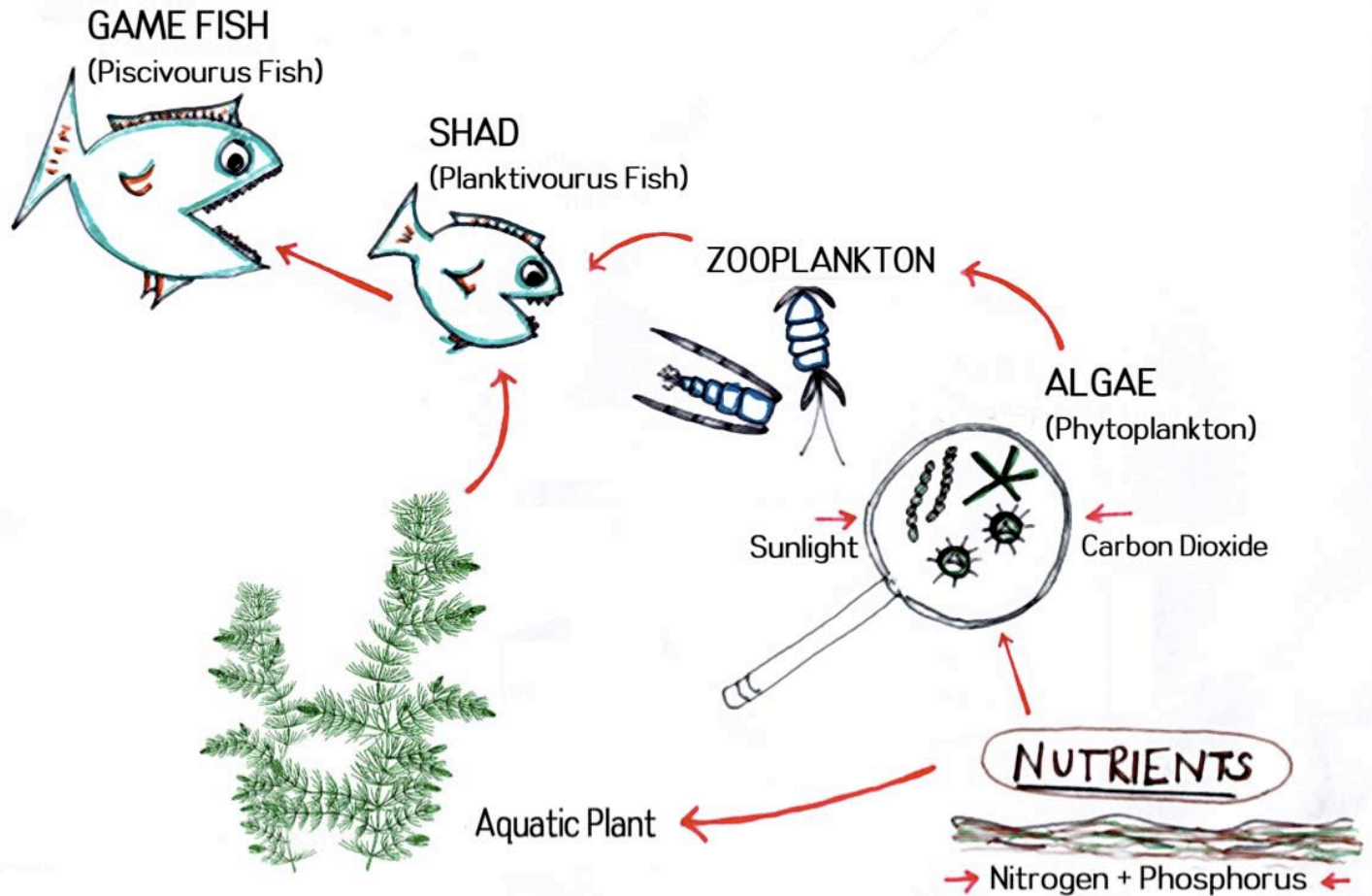


Lake Elsinore Salts (TDS) WQO = 2,000 mg/l

Canyon Lake Salts (TDS) WQO = 700 mg/l

Lake Perris (TDS) WQO = 220 mg/l

Lake Elsinore – Trophic Levels



Shad graze on
daphnia

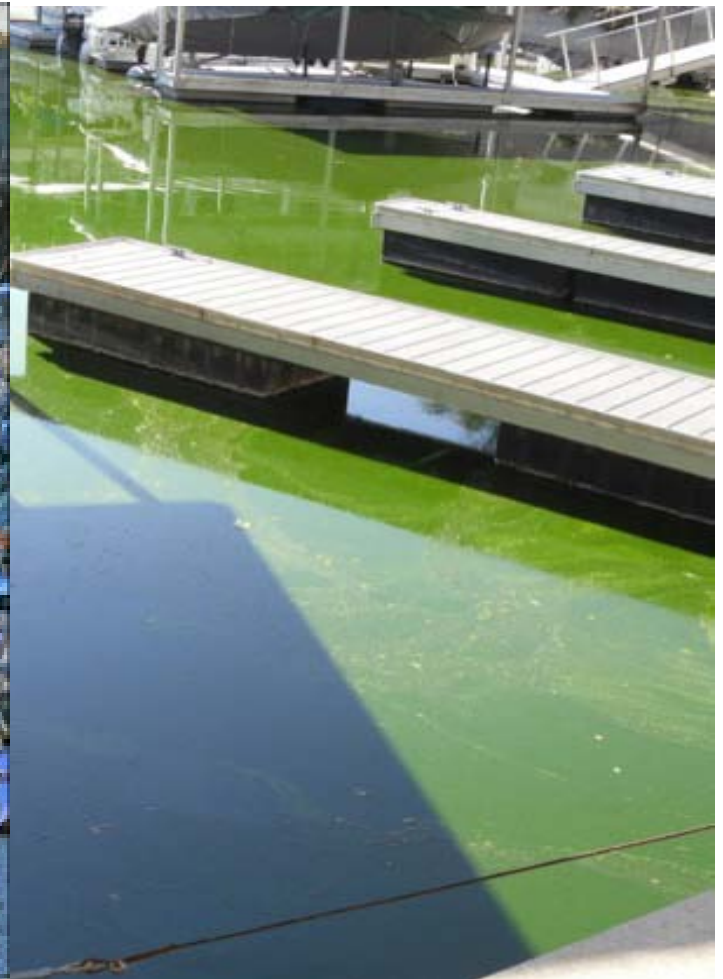


Daphnia are key to
grazing algae

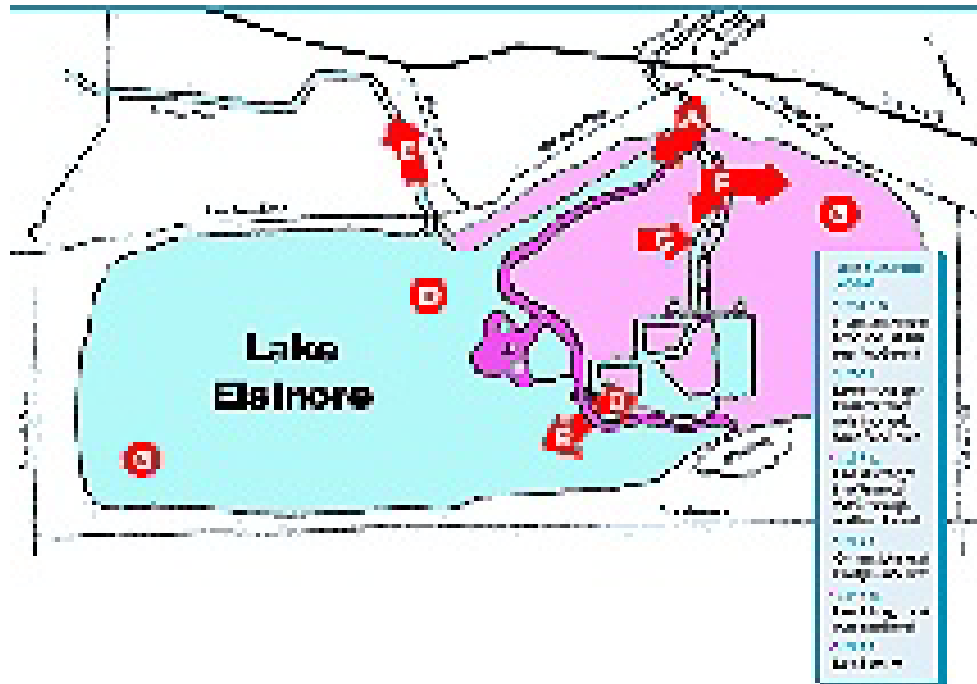


Salt Concentrations above 500
mg/l

Hence.... the problem



Lake Elsinore Management Plan Started 1988, Completed 1995



- Factoids
 - \$40 million
 - Reduced lake by 1/2 size
 - New Inlet Channel
 - New Lower Outlet Channel
- Goals
 - Reduce evaporation loss
 - Reduce flood damage
 - Improve Water Quality
 - Increase visitors
 - Increase recreation
 - Improve fishery

Fish kills continue to occur post Management Plan

Table 3-1. Fish Kill Record in Lake Elsinore

Year	Description
1933	Fish kill and algal bloom in April reported by State Bureau of Sanitary Engineering
1940	Fish kill reported by State Bureau of Fish Conservation
1941	Fish kill reported by State Department of Fish and Game
1948	300-500 tons of carp died from Aug. 31-Sept. 2? -reported by State Department of Fish and Game
1950	"There are no fish in the Lake" -reported by Riverside County Health Department
1966	"An extensive die-off of fish" -reported by State Department of Fish and Game
1972	"During the last week of August, and continuing through September, tons of fish were buried or taken to the dump, mostly thread-fin shad"-reported by State Department of Fish and Game
1991	120 thousands tons of fish killed by algae – reported by The Press Enterprise
1992	12-15 tons fish kill on August 17 – reported by The Press Enterprise
1993	More than 100,000 tons of fish died - reported by Black & Veatch (1996)
1995	10 tons of fish killed, shad and bluegill in September – reported by The Press Enterprise
1996	small fish die-off in August – reported by The Press Enterprise
1997	7 tons of shad died of oxygen depletion in April – reported by The Press Enterprise
1998	200 tons fish kill - reported by The Press Enterprise
2002	100 tons of fish kill - reported by The Press Enterprise

Sources: EDAW Inc., 1974, Press Enterprise Reports, and LEMA, 1996

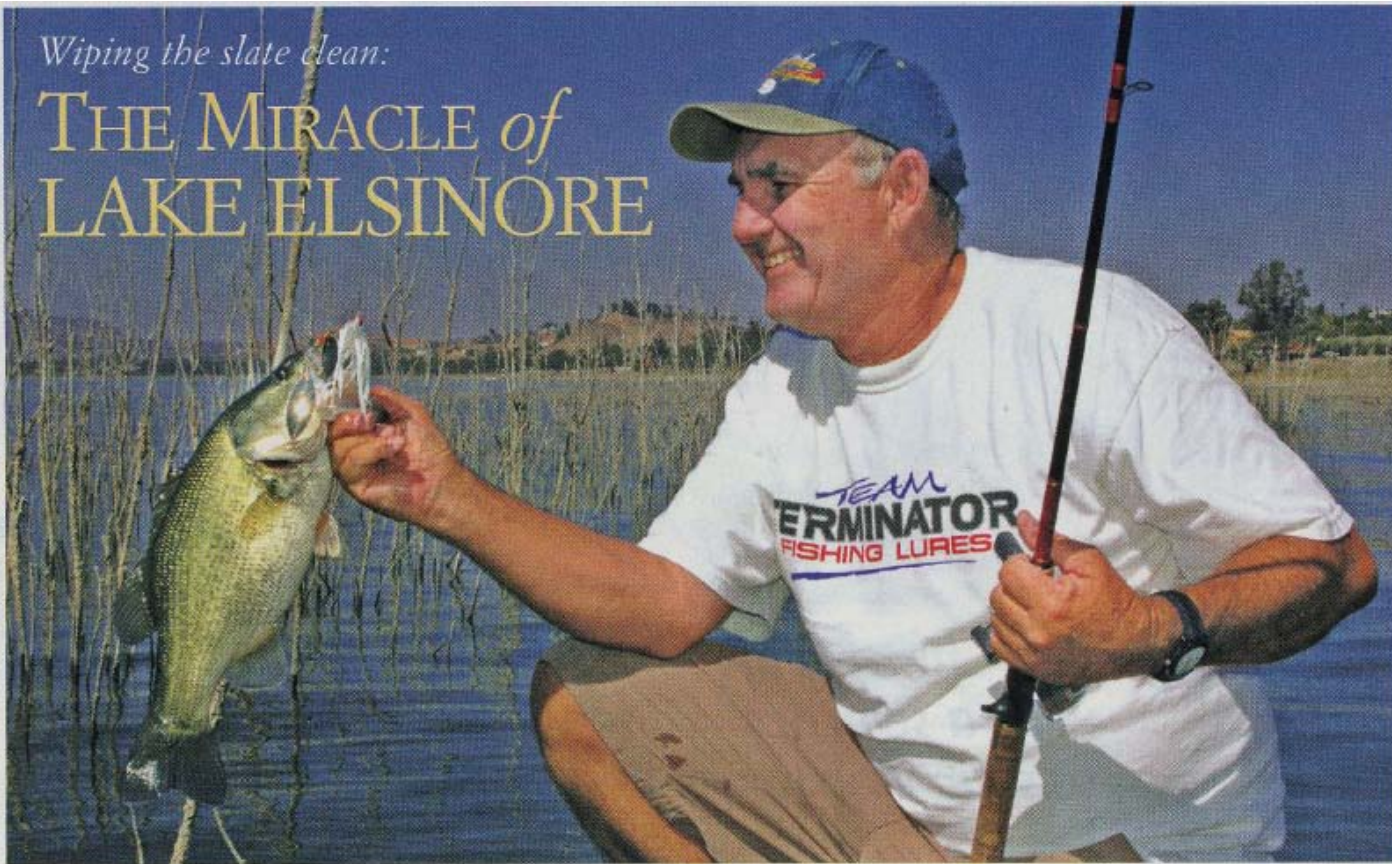
LESJWA 2000 - \$13,000,000 more



Western Outdoors Magazine (February 2009 Issue)

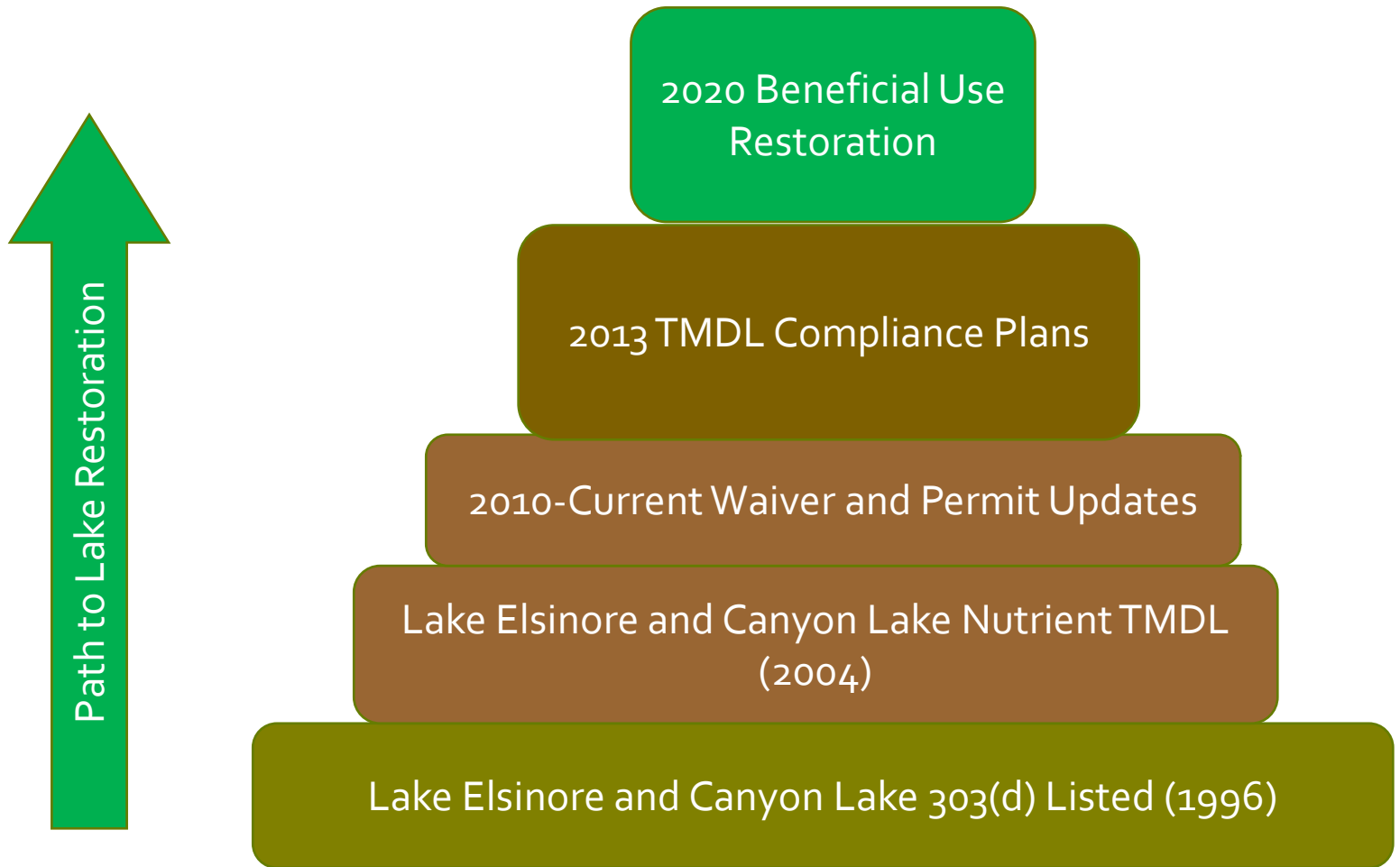
Wiping the slate clean:

THE MIRACLE of LAKE ELSINORE



TO FIND THE 3200-ACRE NATURAL LAKE ELSINORE ON THE MAP AS A VIABLE FISHING DESTINATION MIGHT NOT QUALIFY AS A MIRACLE IN SOME EYES. IT COULD BE ARGUED IT'S MUCH MORE OF A SURPRISE, PROBABLY LIKE THE ONE THAT GREETED THE SPANISH MISSIONARIES OR EXPLORERS WHEN THEY CRESTED THE COASTAL MOUNTAINS EAST OF SAN JUAN CAPISTRANO ONLY TO FIND... *WHATEVER THEY FOUND.*

Federal Clean Water Act Regulatory Path



2010 MS4 Permit Requirements

Preventative Programs

Stormwater Permits

Restorative Programs

Total Maximum Daily Load

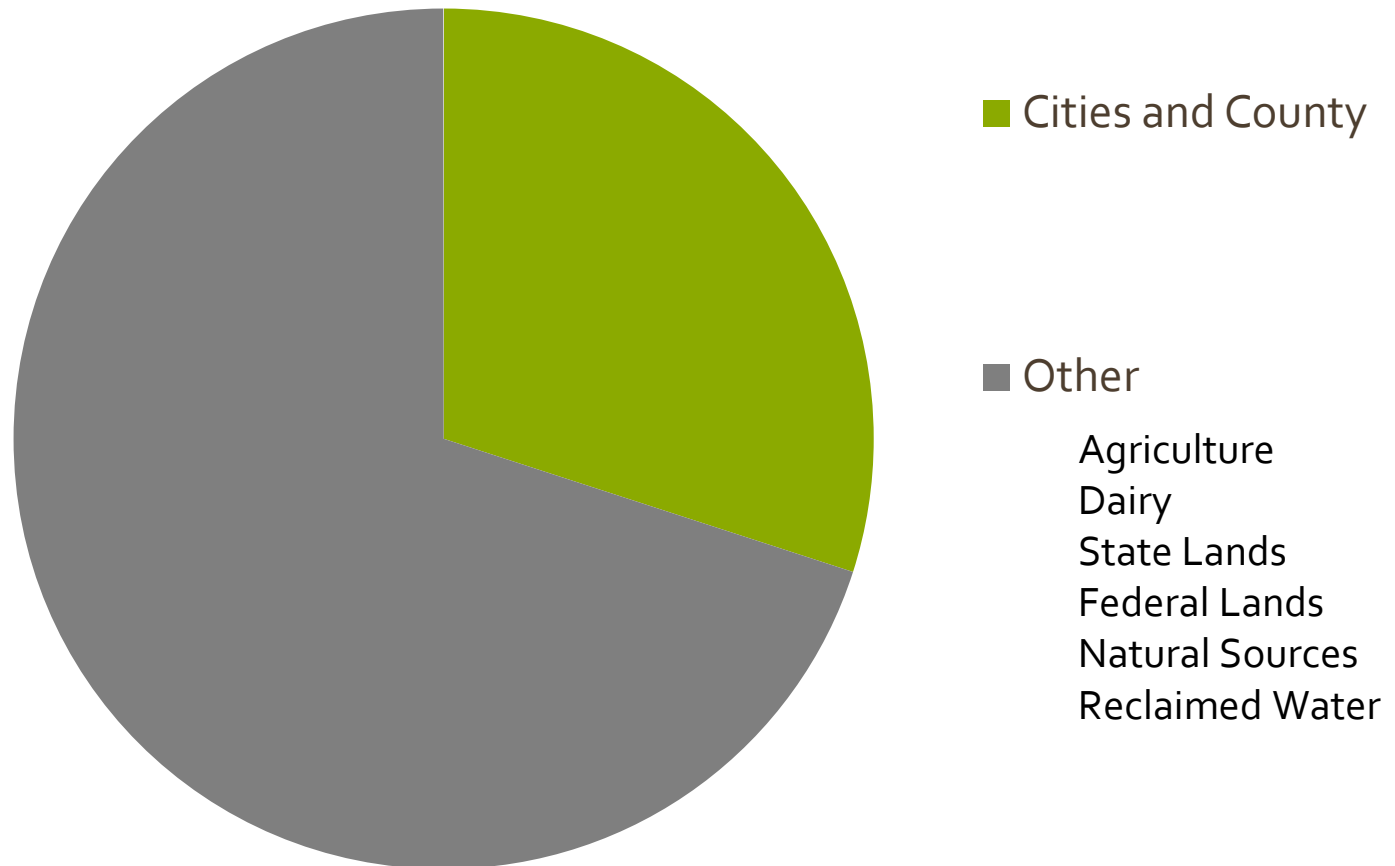
Comprehensive Nutrient
Reduction Plan for
Canyon Lake and Lake
Elsinore

CNRP Goal - 2020



Comprehensive Nutrient Reduction Plan

Addresses Cities and County Nutrient Contribution



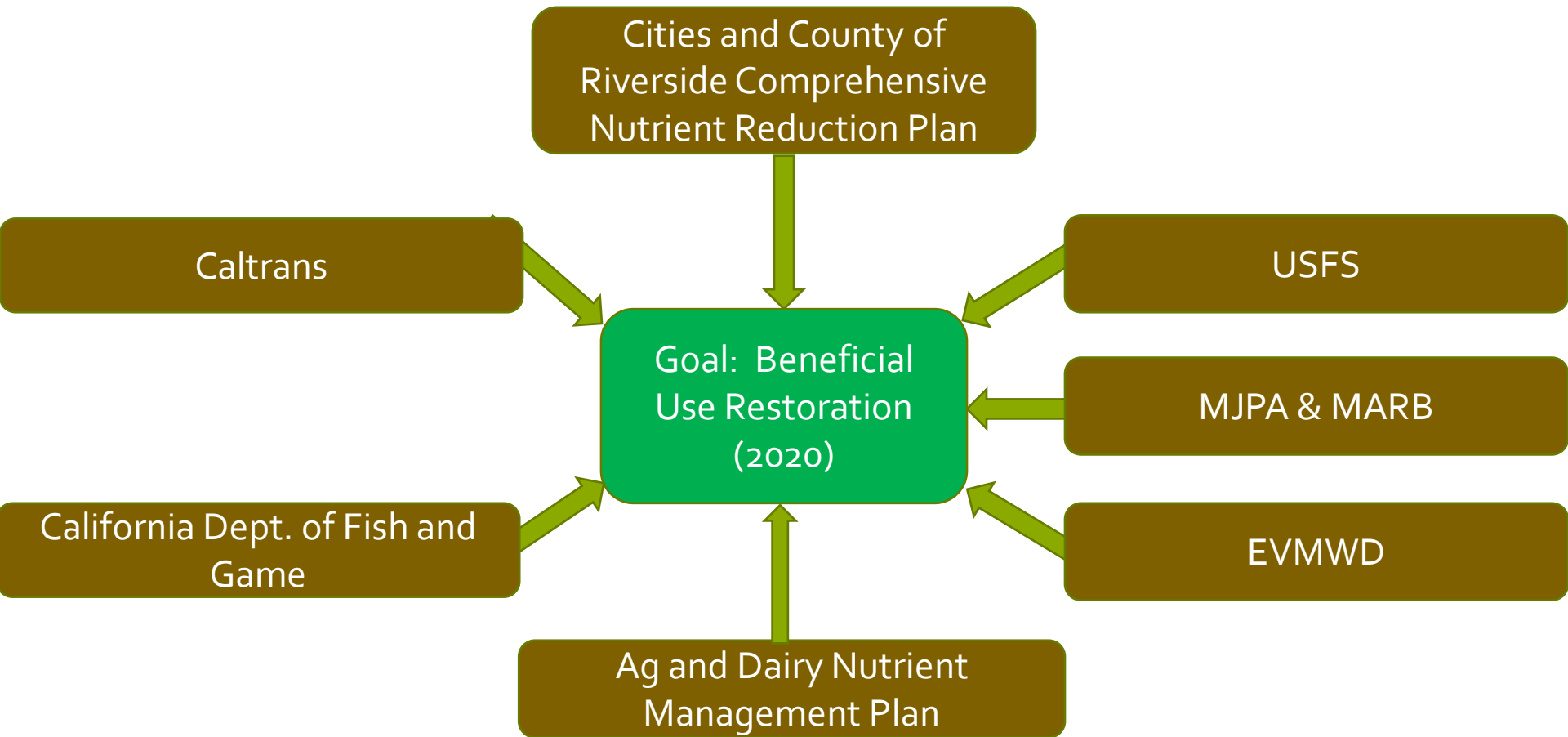
LE/CL TMDL Task Force

- **March Air Reserve Base**
- **March JPA**
- **State of California**
 - Santa Ana Regional Water Quality Control Board
 - Department of Fish and Game
 - Department of Transportation
- **County of Riverside**
- **Riverside County Flood Control District**
- **Cities**

• Beaumont	• Lake Elsinore	• Perris
• Canyon Lake	• Moreno Valley	• Riverside
• Hemet	• Murrieta	• San Jacinto
• Menifee	• Wildomar	
- **Water Agencies:**
 - Eastern Municipal Water District
 - Elsinore Valley Municipal Water District
 - Lake Elsinore and San Jacinto Watersheds Authority
- **Western Riverside County Agricultural Coalition**
 - Dairy Operators (25+)
 - Agricultural Operators (Over 475)



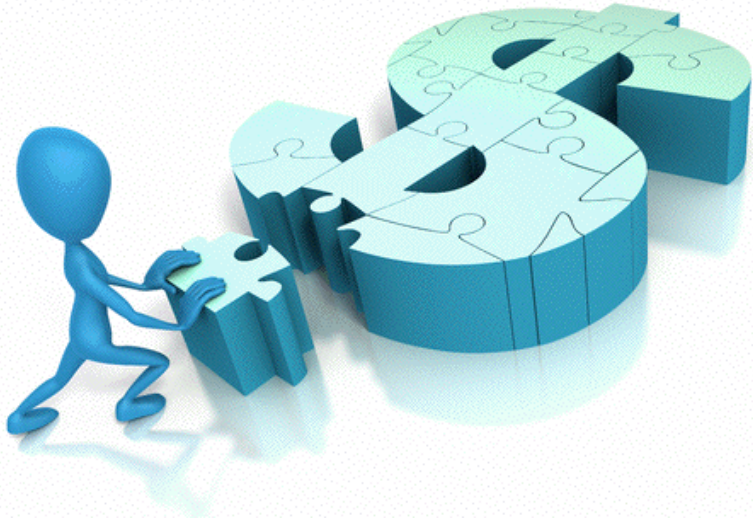
Success depends on coordinated and complimentary actions by all dischargers





Activity To Date

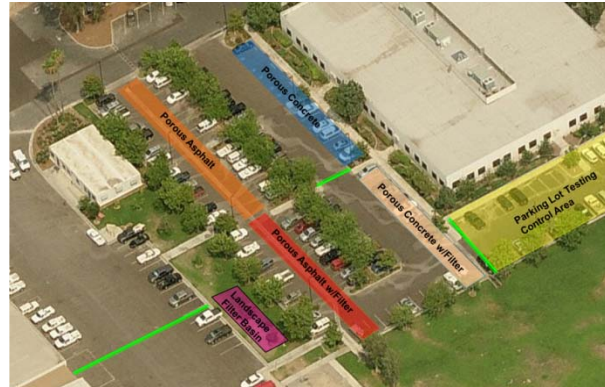
Over \$3 million invested



CNRP Proposal – Identify and Implement Feasible Watershed Based Controls



Illegal Discharge Investigations



Urban Retrofit Projects



New Development Controls



Education/Outreach

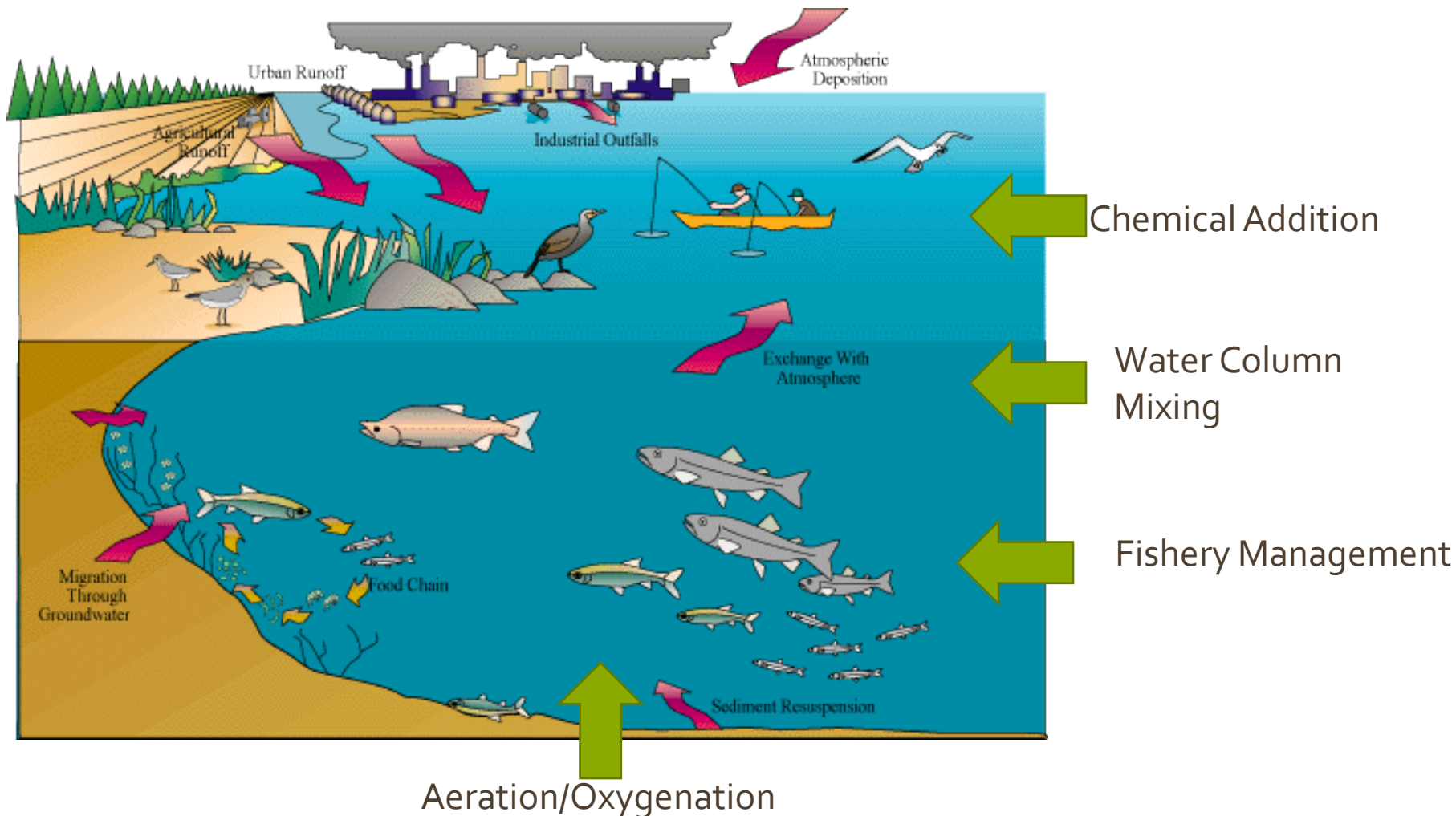


Street Sweeping



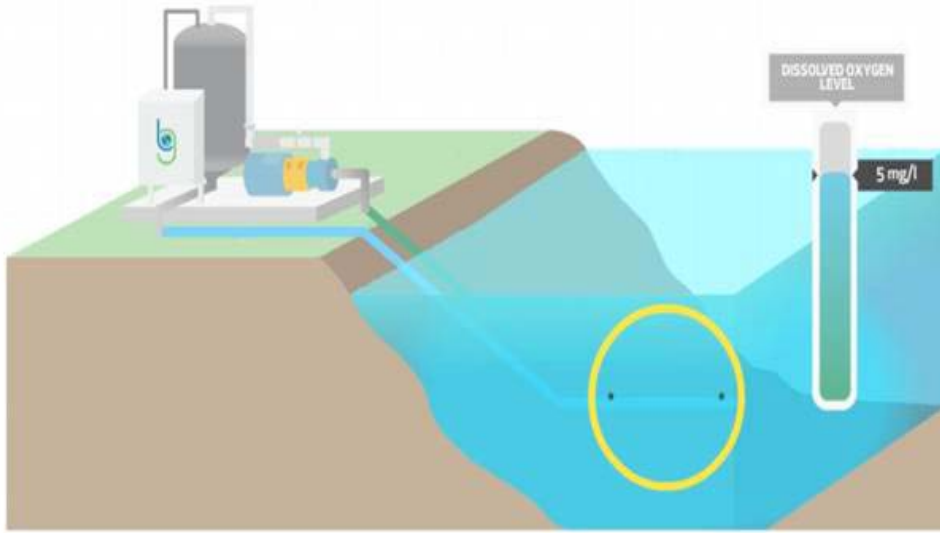
Business Inspection Programs

In-Lake Treatment: Manage effects of nutrients



Canyon Lake Option Comparison

Oxygenation vs. Alum



Alum: Natural mineral used since Roman times





Copyright © 2008 Theodore W. Gray

Alum: Natural mineral used in many lakes



Big Bear Lake –
Test Application



Westlake Village –
As needed



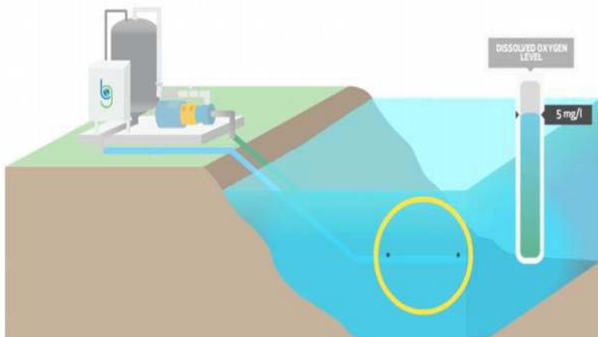
Spring Valley Ranch
- Annually

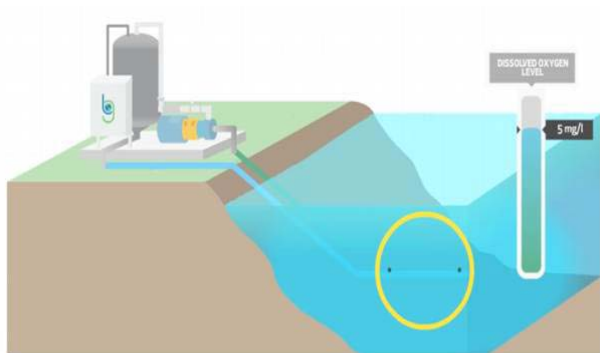
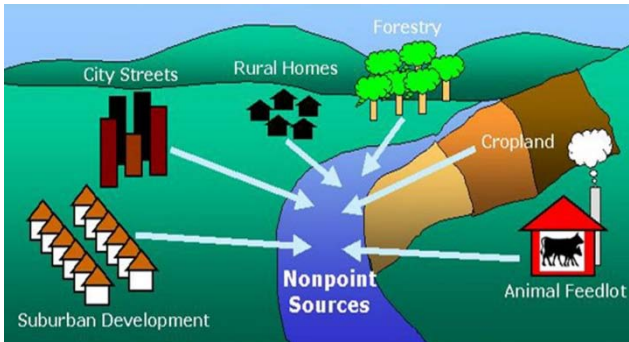


Canyon Lake Option Comparison

Oxygenation vs. Alum

Benefit	Hypolimnetic Oxygenation	Alum Treatment
Meet 2015 Interim Targets	No	Yes
Address Main Body	Yes	Yes
Address East Bay	No	Yes
Immediate Visual Response	No	Yes
Reversible	No	Yes
Meet 2020 Targets	2 of 4 (Chl A)	3 of 4 (Final DO)





Watershed Controls

- Where Feasible
- Multiple benefits

Alum Treatment

- Immediate algal reductions
- Cost effective
- May address DO

Oxygenation or Other Effective Solution

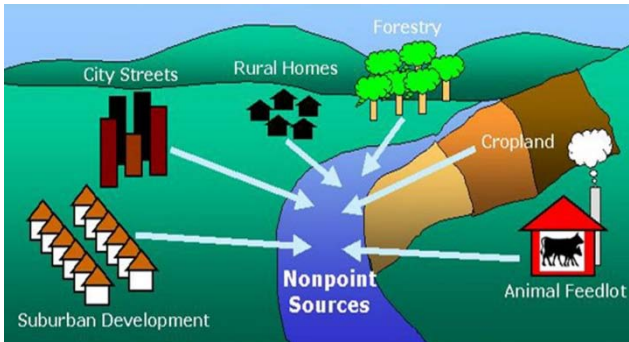
- As needed
- Optimize due to cost

Canyon Lake

Lake Elsinore



Canyon Lake Spillway



Watershed Controls

- Where Feasible
- Multiple benefit
- Canyon Lake controls



In-Lake Aeration and Mixing, Canyon Lake Controls

- Manages Nutrient Loads
- Cost effective



Other BMPs As Needed

- Additional Watershed Controls
- Other In-Lake Controls

\$500,000 Proposition 84 Grant

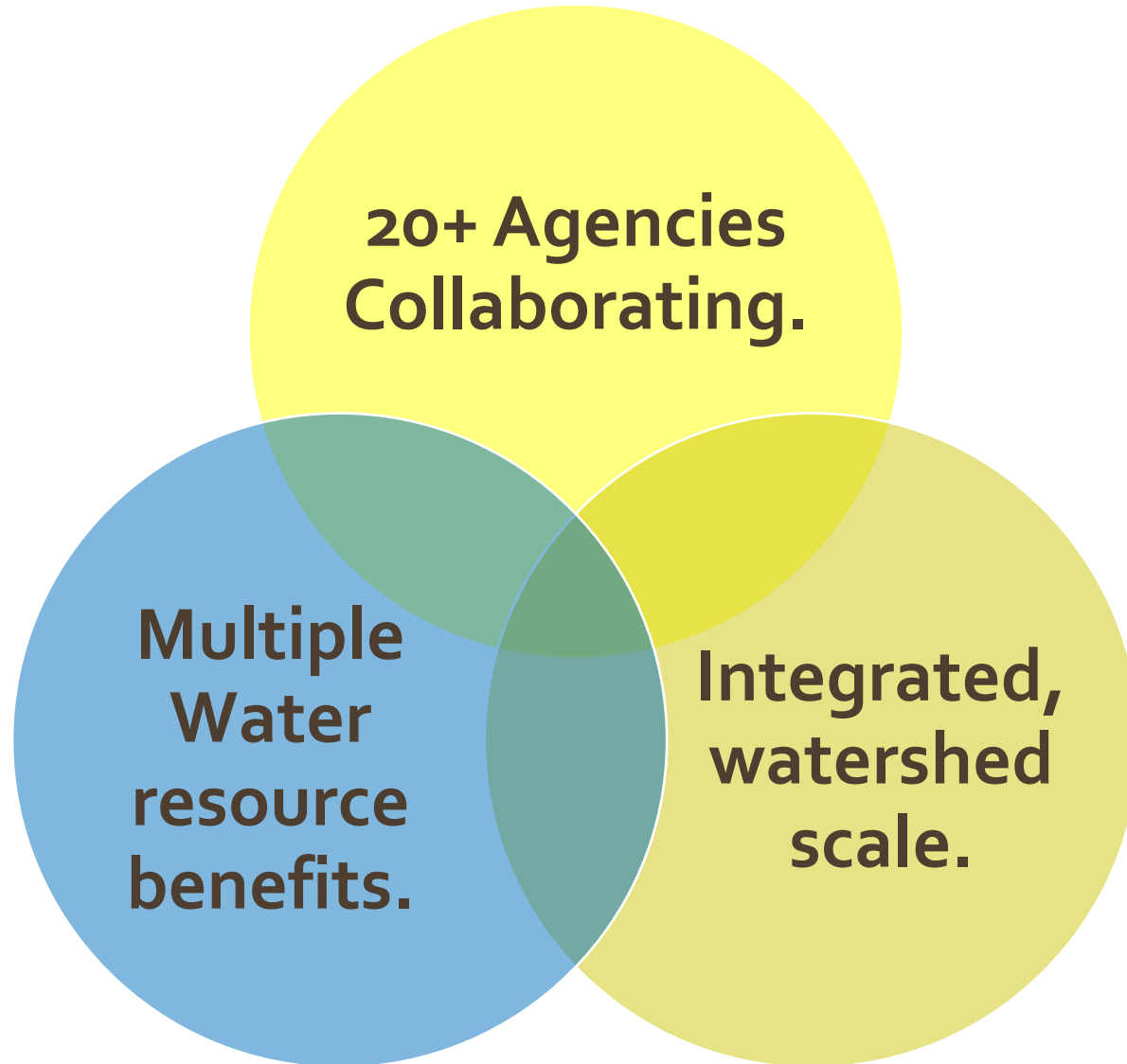


SAWPA's One Water One Watershed Program

Beneficial Use Restoration Ahead of Schedule!



Is this the right solution?





Next Steps

Implement MS₄ CNRP Programs

Coordinate with Other Source Control Programs

Assess results of synergistic programs through Task Force

- Reductions in algal growth

- Reduction in fish kills

- Improvements to fishery

Identify additional needs, if any

Request your support for adoption of the
Comprehensive Nutrient Reduction Plan for Lake
Elsinore and Canyon Lake

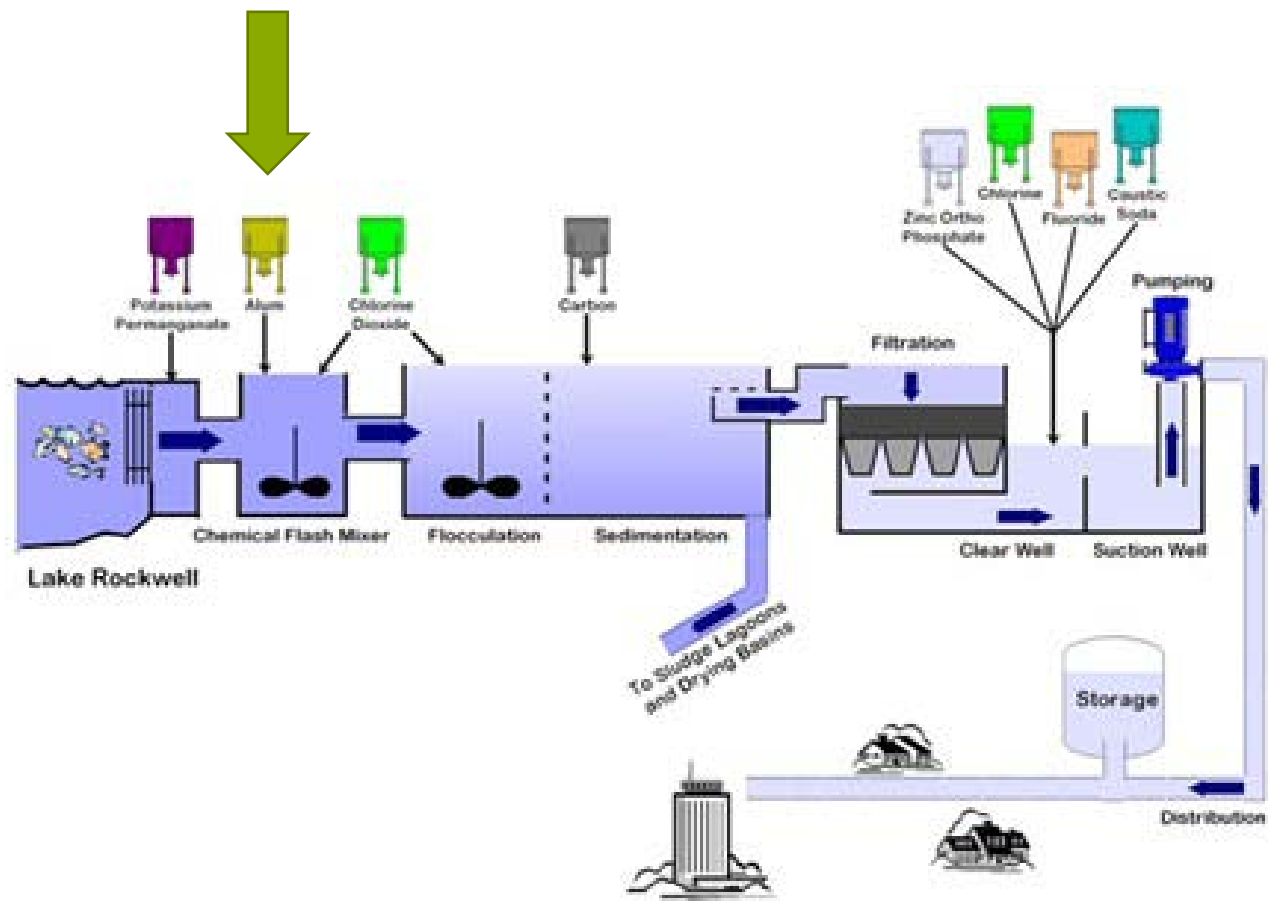
Questions?

End of Show

Alum: Natural mineral used in water purification



- Used by EVMWD Water Treatment Plant



Alum Treatment: Consider aquatic and recreation impacts

Test for potential aquatic side-effects

- Lab tests using Canyon Lake water, benthic organisms

Minimize impacts to recreational use

- Coordinate through POA, City. Tentatively
 - September 2013
 - February 2014
 - Bi-annually from there

Permitting and CEQA

- CEQA initiated, estimated completion May 2013
- Coordinating with RWQCB on Permitting issues
- Coordinating with EVMWD regarding impacts to water supply
- Coordinating with City/POA regarding recreation

Alum Treatment: Outreach to Residents

Develop Whitepaper, presentations

- What, where, how, when, why

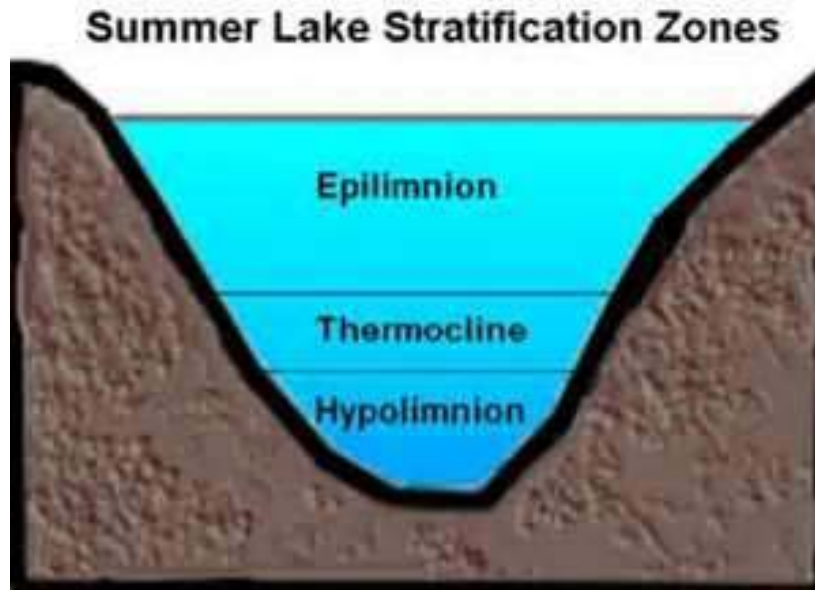
Outreach to local organizations

- Describe proposal
- Identify and understand issues and concerns

Permitting, Plans and CEQA

- Incorporate public input
- Address issues and concerns

Nutrient cycle

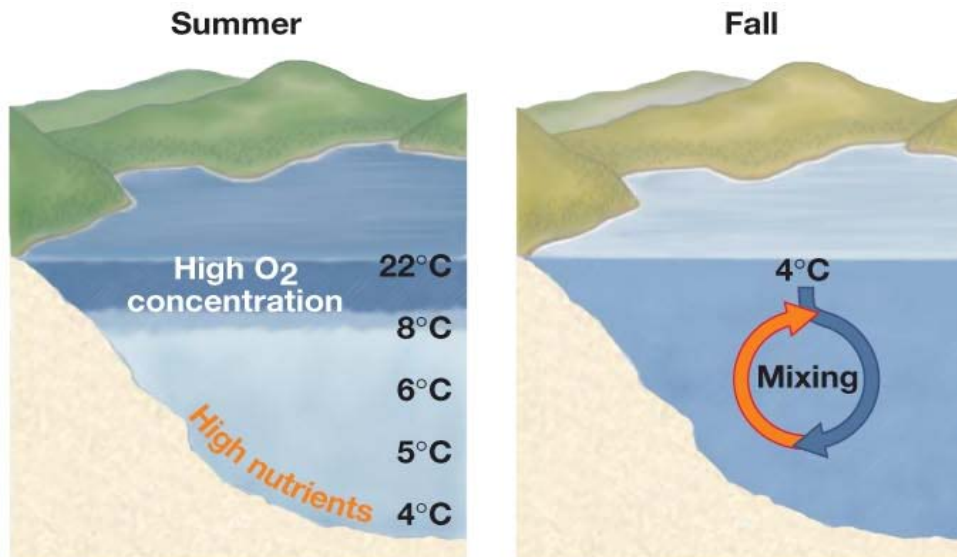


Alum applications:

Focus on managing algal concentration in lake, also address oxygen levels.

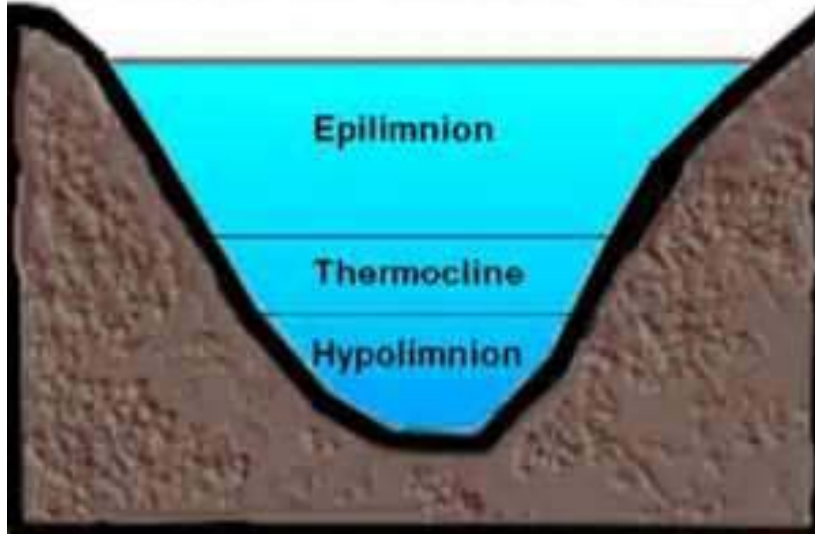
February – after wet season, before March bloom.

September: Prior to fall lake mixing.

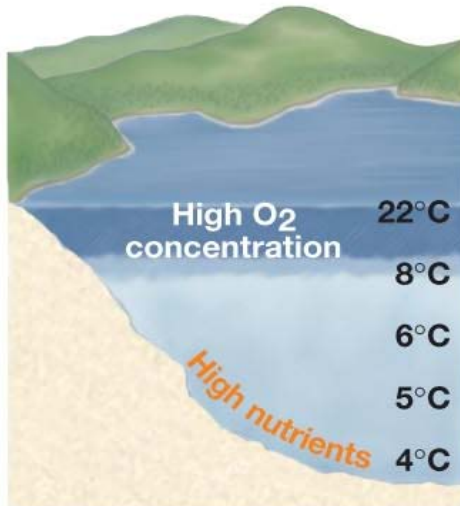


Nutrient cycle

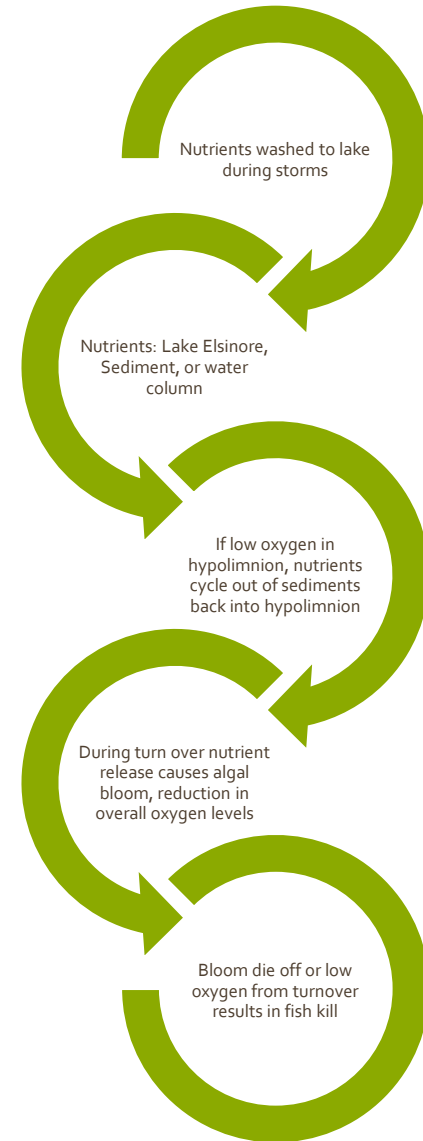
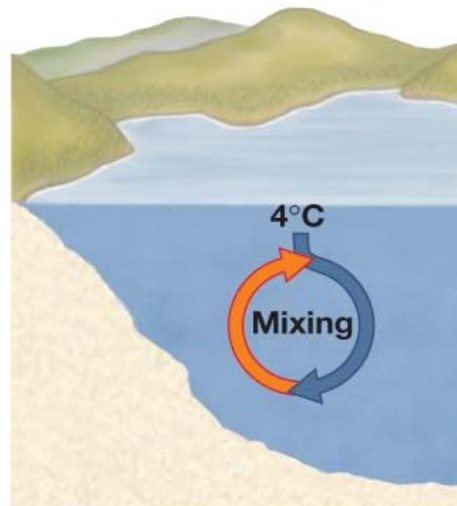
Summer Lake Stratification Zones



Summer



Fall



Disadvantaged Communities: San Jacinto River Sub-Watershed

Watershed Percentage as DAC - 41%

