

Watershed: Cosumnes River

Years Sampled: 2007-2008, 2010, 2012-2014

Study Objectives:

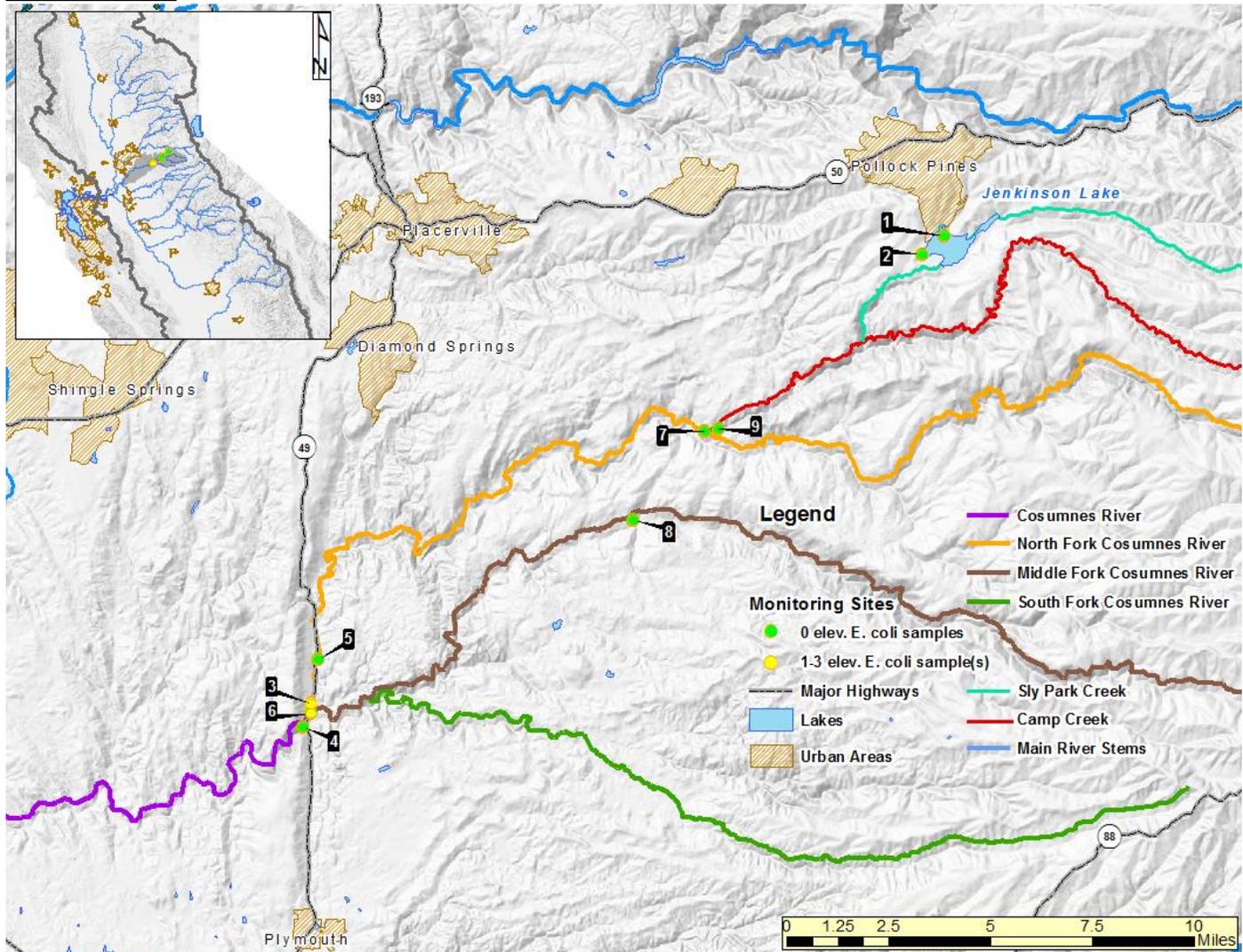
1. Is there any evidence that beneficial uses are being impacted, and if so, what are potential contributors?
2. Are there any noticeable regional, seasonal or trends observed in the water quality data?
3. What are pathogen concentrations at selected monitoring sites?

KEY STATISTICS

Number of sites sampled	9
Sampled by	Water Board Staff (Sac)
Number of sites sampled for pathogens	0
Number of total samples	105
Sampling Frequency	2x/mo. (May-Sept.)
Assessment Threshold	320 MPN/100 mL

Message Two sites have had one or more samples with elevated *E.coli*. Seven sites never exceeded the assessment threshold

Site Locations:



Summary of Results:

Table 1: Field Measurements

Station Code	Map #	Station Name	Oxygen, Dissolved (mg/L)		pH		SpConductivity (uS/cm)		Temperature (°C)		Turbidity (NTU)	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
532ELD001	1	Jenkinson Lake at Pinecone Campsites 1-30	6.49	8.49	7.32	7.80	32.0	43.0	20.38	26.20	2.25	62.20
532ELD002	2	Jenkinson Lake at Mormon Emigrant Trail	6.48	8.41	7.55	7.92	37.0	44.0	18.53	24.94	0.91	5.64
532ELD003	3	Cosumnes River at Gold Beach Park	3.49	8.81	6.66	7.77	57.0	78.6	18.20	27.33	0.54	18.00
532ELD004	4	Cosumnes River at HWY-49	7.55	9.7	6.80	8.92	62.0	159.2	19.04	29.04	0.28	1.77
532ELD005	5	Cosumnes River above Gold Beach	NR	NR	7.79	7.79	102.0	102.0	NR	NR	6.53	7.41
532ELD006	6	Cosumnes River below Gold Beach	NR	NR	7.59	7.59	101.0	101.0	NR	NR	0.70	1.01
532ELD007	7	Cosumnes River, N Fork at Happy Valley Road	7.44	10.15	7.54	7.89	44.0	85.0	13.28	21.94	0.27	3.07
532ELD008	8	Consumnes River, M Fork at Twin Bridges	7.41	9.43	7.28	8.02	42.0	79.6	15.78	24.91	0.18	6.73
532ELD010	9	Camp Creek at Happy Valley Cutoff	7.44	10.15	7.42	7.89	44.0	59.0	13.28	23.37	0.27	16.30

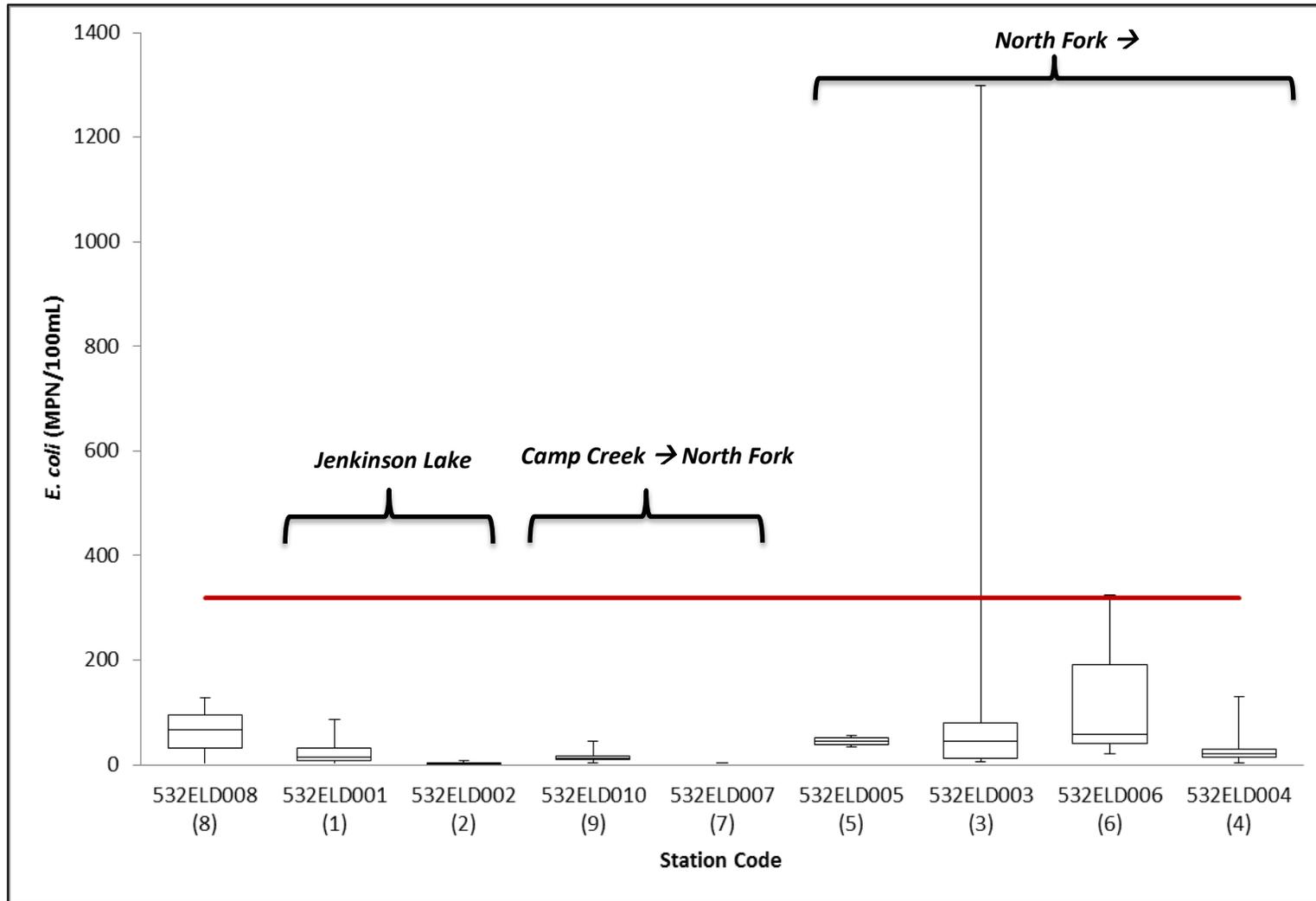
NR: Not Recorded

Table 2: E. coli and Pathogen Results

Map #	E. coli (MPN/100ml)					Cryptosporidium (cysts/L)			Giardia (oocysts/L)			Salmonella (MPN/100mL)			E.Coli O157:H7 (Presence/Absence)		
	Mean	Min	Max	Count	>320	Max Result	Count	(+)	Max Result	Count	(+)	Max Result	Count	(+)	Result	Count	(+)
1	25.2	<1.0	85.7	19	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
2	2.6	<1.0	8.5	10	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
3	144.9	6.3	1299.7	22	3	NA	0	0	NA	0	0	NA	0	0	NA	0	0
4	31.2	3.1	130.9	17	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
5	45.1	33.6	56.5	2	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
6	134.9	20.3	325.5	3	1	NA	0	0	NA	0	0	NA	0	0	NA	0	0
7	3.1	3.1	3.1	1	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
8	62.7	2.0	129.1	16	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
9	15.1	3.1	45.9	15	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0

E.coli - Highlighted Cells: Exceeds EPA Guideline of 320 MPN/100ml
 Pathogens - (+): positive result, Highlighted Cells: positive results, NA: Not Applicable

Graph 1: E Coli Results



1,2 = shorelines along Jenkinson Lake; 9,7 = progressive DS flow from Camp Creek (9) to North Fork (7);
 5,3,6,4 = progressive DS flow from North Fork (5,3,6) to Cosumnes River (4)

WHAT IS THE MEASURE SHOWING?

The Cosumnes River flows ~50 miles from the western Sierra Nevada to southern Sacramento County. It is comprised of a North, Middle, and South Fork, which converge along Highway 49 north of Plymouth and empty into the Mokelumne River. One major tributary to the North Fork is Camp Creek, which is partly fed, in turn, by Sly Park Creek further north near Pollock Pines. Although the Cosumnes River is relatively undammed, flow from Sly Park Creek is impounded at Jenkinson Lake, a popular reservoir used for recreation. Field measurements for each site are shown in Table 1.

Results show that two sites exhibited elevated levels of *E. coli* in the Cosumnes watershed on one or more occasions (shown in Table 2). There were 4 samples with elevated levels out of 105 samples, or 3.8%. The highest concentration (1299.7 MPN/100mL) occurred at Gold Beach Park (3). While there were detections along the North Fork (shown in Graph 1), their occurrences were few relative to the sample count for these sites [with the exception of Cosumnes River below Gold Beach (6), which has an unrepresentative sample size of 3]. There were no detections along Jenkinson Lake, the Middle Fork, or Camp Creek.

The watershed is primarily forest (Jin et al., 2013), yet potential non-point and urban sources are abundant. It is heavily utilized for recreational activities, and is home to numerous waterfowl throughout the year as well. In addition, the increasing drought may be a contributing factor for contamination as the waters become more concentrated. Further study is needed to identify specific sources.

No sites in the Cosumnes watershed were sampled for pathogens.

WHY THIS INFORMATION IS IMPORTANT?

In 2012, the USEPA amended recreational water quality guidelines for human health under the Clean Water Act, specifying the standard threshold value (STV) for the indicator bacteria *E. coli* as 320 colony-forming units (CFU) per 100 milliliters (mL). The STV represents the 90% percentile of the water quality distribution, beyond which the water body is not recommended for recreation (Nappier & Tracy, 2012).

E. coli is an indicator of potential fecal contamination and risk of illness for those exposed to water (e.g. when swimming). Since *E. coli* is only an indicator of potential pathogens and does not necessarily identify an immediate health concern, the data collected from this study provide more information on pathogen indicators as well as specific water-borne pathogen concentrations to better assess their impact on the beneficial use of recreation and to identify potential contributors by sub watershed.

WHAT FACTORS INFLUENCE THE MEASURE?

E. coli and specific water-borne pathogens can come from human or animal waste and may be highly mobile and variable in flowing streams. In addition to human recreational use, the presence of pathogens in water may be the result of cattle grazing, wildlife, urban and agricultural runoff, or sewage spills. The physical condition of the watershed may also influence pathogen measurements, however in this study field measurements (temperature, SC, DO, turbidity and pH) were variable between sites and it is unclear if these constituents had an effect on the *E. coli* or pathogen measurements.

TECHNICAL CONSIDERATIONS:

- Data source: Central Valley Water Board SWAMP
- *E. coli* is only an indicator of potential pathogens and does not necessarily identify an immediate health concern.
- Public reports and fact sheets are available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_studies/surface_water_a mbient_monitoring/swamp_regionwide_activities/index.shtml

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