

Watersheds: Pit River

Sampling

Period: March 2001 – October 2002

Report

- Objectives:**
1. Assess existing water quality in the Pit River and provide a basis for comparison with past and future studies;
 2. Evaluate to what extent existing water quality may be limiting aquatic resources and other beneficial water uses;
 3. Evaluate the appropriateness of the 303(d) listing;
 4. Provide input to the ongoing watershed assessment for the Pit River and protection/restoration efforts underway by the individual Resource Conservation Districts and the Pit River Alliance

KEY STATISTICS

<i>Size of Pit River Watershed</i>	<i>4,300 sq mi</i>
<i>Number of sites Sampled</i>	<i>8</i>
<i>Number of Constituents measured</i>	<i>13</i>
<i>Grab Samples Taken</i>	<i>~960</i>
<i>Continuous Monitoring</i>	<i>Flow Temperature</i>

MESSAGE: Data collected was consistent with results from previous studies and data from other Northern California streams. Based on data from this study, 303(d) listings for temperature, dissolved oxygen, and nutrients should be maintained. However, further data, collected under different flow regimes, is needed to accurately characterize potential to attain water quality objectives for these constituents and bacteria.

Site Locations:

Station Number	Site Description	Latitude	Longitude
Station 1:	North Fork Pit River Above Alturas	N 41 35' 34.5"	W120 25' 24.7"
Station 2:	South Fork Pit Near Likely (2001 South Fork Pit River at West Valley Creek Confluence) (2002 South Fork Pit River at County Road 64)	N 41 13' 48.4"	W120 25' 0.8"
Station 3:	North Fork Pit River at Alturas	N 41 28' 31.2"	W120 33' 19.1"
Station 4:	South Fork Pit River at Alturas	N 41 28' 23.8"	W120 33' 22"
Station 5:	Pit River at County Road 70	N 41 25' 47.4"	W120 44' 11"
Station 6:	Pit River at Highway 299 Canby Bridge Pit River at Lookout	N 41 24' 3.6" N 41 12' 29.2"	W120 55' 58.3" W121 8' 47"
Station 7:	(2001 Pit River at County Road 90) (2002 Pit River at County Road 91)		
Station 8:	Pit River at Pittville	N 41 2' 42.6"	W121 19' 52.7"



Table 1: Summary of Potential Beneficial Use Concerns: Pit River Watershed (March 2001 – October 2002)

Beneficial Use/Indicator	Pit River Sampling Sites							
	Pit River at Pittville (8)	Pit River at Lookout (7)	Pit River at Hwy 299 Canby Bridge (6)	Pit River at Co Rd 70 (5)	South Fork Pit River at Alturas (4)	North Fork Pit River at Alturas (3)	South Fork Pit River Near Likely (2)	North Fork Pit River above Alturas (1)
Drinking Water								
Specific Conductivity (900 umhos/cm, CA Dept of Public Health)					X	X		
Aquatic Life	303(d)	303(d)	303(d)	303(d)	303(d)	303(d)	303(d)	303(d)
pH (6.5 - 8.5, Basin Plan)	X	X	X	X	X	X	X	X
Temperature (66 – F Maximum Weekly Average Temperature, EPA)	X	X	X	X	X	X	X	X
Dissolved Oxygen (7.0 mg/l, Basin Plan)	X	X	X	X	X	X	X	X
Irrigation Water Supply								
Specific Conductivity (700 umhos/cm, Food & Ag Org. of United Nations)					X	X		
Recreation (Swimming)								
Fecal Coliform (400 MPN/100ml, Basin Plan)	X	X	X	X	X	X	X	X
<i>E. coli</i> (<235 MPN/100ml, USEPA Recreation Guideline for Designated Swimming areas)		X		X	X	X		

WHAT IS THE MEASURE SHOWING?

The data gathered over a 19 month period provides information on water quality from March 2001 – October 2002 and preliminary indications on the potential beneficial use impacts on the Pit River watershed.

River temperature patterns were relatively consistent throughout the study reach, i.e. there was no significant increase or decrease in water temperature as one goes from the upstream stations to the downstream stations. A number of dissolved oxygen readings fell below the 7.0 mg/L level and levels were generally consistent with the findings from previous Pit River monitoring. There were no obvious upstream/downstream trends in nutrient concentrations.

There were no observed seasonal trends in nutrient concentrations except that nitrate concentrations were somewhat higher in winter than in summer. Levels of fecal coliform and *E. coli* bacteria periodically exceeded the water quality objective maximum concentrations. Of a total of 96 *e-coli* bacteria samples, 8 exceeded the maximum of 235 MPN. Both turbidity and suspended sediment showed no particular upstream to downstream trend. There were occasional spikes in both turbidity and TSS which occurred at various times and stations. pH readings in the Pit River during the low flow summer season frequently exceed the Basin Plan water quality objective maximum of 8.5. Conductivity in the Pit River seems to be in a 'normal' range for eastside waters. There is no indication that standard minerals and metals were at levels that would adversely impact beneficial uses. Examination of bioassessment metrics (Taxa Richness, %EPT, Shannon Diversity, % Tolerant Taxa, and % Intolerant Taxa) showed less robust communities at North Fork Pit at Alturas, South Fork Pit at Alturas, and Pit River at Lookout, as compared to the other stations. Results of the October 2002 USF&WS survey were not available at the time of Final Report preparation.

WHY IS THIS INFORMATION IMPORTANT?



The Pit River Watershed supports multiple beneficial uses (e.g. Contact Recreation, Aquatic Life, Drinking Water, Irrigation Water Supply) and is currently 303(d) listed for several water quality constituents, i.e. temperature, dissolved oxygen, and nutrients. The current 303(d) listing should be maintained for temperature, nutrients and dissolved oxygen, but not for *E. coli*. Information collected from this study (and future studies) will be of limited value unless it is repeated in a long-term, consistent monitoring program. The Pit River Monitoring and Assessment Committee should develop a long-term, coordinated Pit River watershed monitoring program plan and seek support for a monitoring coordinator to assume overall responsibility for implementing that plan.

WHAT FACTORS INFLUENCE THE MEASURE?

Land Use: Timber, livestock grazing and agricultural production are the major land use practices.

Hydrology: The watershed boundary occurs primarily in Modoc County, with decreasing amount of acreage in Lassen, Siskiyou, and Shasta counties.

Water Year Type: Although not discussed in the report, water years 2001 and 2002 were classified as "Dry" based on the California Department of Water Resources Snow Surveys as applied to criteria in the Basin Plan. A summary of historic water year types is located at <http://cdec.water.ca.gov/cgi-progs/iodir/wsihist>.

Flow: Flows in the Pit River were substantially below the recorded historic average as measured at the Canby and Pittville Stations. Historic flow was calculated at 136 cfs (estimated flow of Big Eddy Springs) – 36 cfs (estimated flow of Sucker Springs) – 5 cfs (estimated flow from PGE Spring). During the time of the sampling, flow at the Canby station was 26% of historic and flow at the Pittville Station was 31% of historic.. Low water levels would have an impact on many of the water quality constituents measured in this monitoring program. Future water quality monitoring during higher than normal precipitation and River flow conditions would be useful in better understanding overall water quality conditions in the Pit River.

TECHNICAL CONSIDERATIONS:

- *E. coli* is only an indicator of potential pathogens and does not necessarily identify an immediate health concern.
- Sample collection and analysis:
 - Field samples were collected by Central Valley Water Board staff
 - Macroinvertebrate samples were collected by Central Modoc RCD and Pit River Alliance staff, and analyzed at the DFG Aquatic Bioassessment lab in Chico, California.
 - Fish Survey was conducted by US Fish and Wildlife
 - All other analyses were conducted by Basic Laboratory in Redding, California.
- Water quality data for all constituents except temperature logger is not included in the report. Therefore, completeness cannot be determined.
- References:
 - Public report and fact sheet are available at: http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_studies/surface_waterambient_monitoring/swamp_water_quality_reports/swamp_report_summary_sheet/index.shtml
 - Central Valley Regional Water Quality Control Board (CVRWQCB). 2007. Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins, Fourth Edition, August 2006.
 - Department of Water Resources (DWR). Water Quality Conditions. October 2005, 2006. <http://www.water.ca.gov/publications/browse.cfm?display=topic&pub=120,382>