

Stream Water Chemistry Report Summary

Stream Name: Unnamed Stream

Water Chemistry Parameters	Observed Value					Standard
	2013	2014	2015	2016	2017	
Total Suspended Solids (mg/L)	14.93 ± 8.07	18.99 ± 7.47	18.80 ± 37.79	17.00 ± 18.43	6.88 ± 7.48	< 8.9
Alkalinity (mg/L)	238.14 ± 24.34	236.86 ± 24.34	263.78 ± 28.44	206.29 ± 49.14	293.57 ± 41.78	> 130
Chloride (mg/L)	8.31 ± 1.29	10.21 ± 1.29	9.52 ± 7.57	7.87 ± 3.67	8.91 ± 4.77	
Total Phosphorus (mg/L)	0.03 ± 0.01	0.04 ± 0.06	0.03 ± 0.02	0.03 ± 0.01	0.02 ± 0.01	< 0.01 - 0.03
Chlorophyll a Content (mg/L)	1.12 ± 0.48	0.41 ± 0.48	0.98 ± 0.87	2.95 ± 1.99	1.77 ± 0.92	
Temperature (°C)	14.08 ± 2.47	11.01 ± 2.29	14.67 ± 3.96			
pH	7.80 ± 0.28	7.85 ± 0.12	7.80 ± 0.20			Between 6.5-8.5
Conductivity (spc)	0.393 ± 0.08	0.536 ± 0.07	0.570 ± 0.30			
Dissolved Oxygen (mg/L)	6.69 ± 1.31	7.38 ± 1.21	9.64 ± 2.42			> 6.0
Total Organic Nitrogen (mg/L)	0.64 ± 2.63	4.19 ± 2.63	0.51 ± 0.14	0.70 ± 0.13	0.49 ± 0.12	< 1.1
Caffeine (µg/L)			0.0286			

While there is active agricultural activity in the Unnamed Stream's watershed, cattle generally can not directly access the stream or its tributaries. Accordingly, cattle exclusion from the Unnamed Stream is largely not possible. The relatively stable water chemistry across the first four years at the Unnamed Stream reflects this, particularly when compared to other study sites where thousands of cattle have been actively excluded from the stream (i.e. Judges Creek, Stokes River). At those sites we have observed significant decreases in total suspended solids, while at the Unnamed Stream total suspended solids values have remained relatively constant across the years at approximately 17 mg/L. However, 2017 is marked with a notable, but not statically significant, decline in total suspended solids. The 60% decline in total suspended values between 2016 and 2017 brought this water quality measure down to levels within the standard guidelines (<8.9 mg/L). This decline most likely reflects recent changes in water management over a 120 ha cropping region directly upstream from the sampling point at the Unnamed Stream.

The 2017 sampling campaign also reported the lowest levels of total phosphorus and total organic nitrogen ever observed at the Unnamed Stream. In fact, the total organic nitrogen levels are lower than the reference stream, while the total phosphorus levels are the lowest of any agriculturally impacted stream monitored by the Six Streams Project. This apparent decrease in nutrients may simply reflect year-to-year variation. Alternatively, the previously mentioned change in upstream water management may have reduced the capacity for agriculturally applied nutrients to enter the Unnamed Stream.

Despite lower nutrient levels in the Unnamed Stream in 2017 we still observed elevated chlorophyll a production in the water column, with 2017 values 58% above 2013 values. That said, 2017 chlorophyll a values have decreased since 2016, when chlorophyll a values exceeded 2013 values by 163%. Still, 2017 values at the Unnamed Stream are approximately 200% above reference stream values, indicating there is still much room for improvement at this site if the goal is to reduce nuisance vegetation growth.