Stream Water Chemistry Report Summary

Stream Name: Swan Lake Drain

Water Chemistry Parameters	Observed Value			Standard
	2013	2014	2015	
Total Suspended Solids	7.33 ± 1.80 mg/L	6.17 ± 1.67 mg/L	17.22 ± 29.25 mg/L	< 11.2 mg/L
Alkalinity	252.67 ± 18.49 mg/L	224.14 ± 17.12 mg/L	263.44 ± 51.81 mg/L	< 224.83 mg/L
Chloride	7.97 ± 1.45 mg/L	10.57 ± 1.37 mg/L	186.76 ± 504.46 mg/L	
Total Phosphorus	0.028 ± 0.004 mg/L	0.021 ± 0.004 mg/L	0.118 ± 0.241 mg/L	< 0.01 - 0.03 mg/L
Chlorophyll a Content	0.535 ± 0.12 mg/L	0.366 ± 0.12 mg/L	2.185 ± 2.529 mg/L	
Temperature	16.38 ± 2.75 C	11.28 ± 2.51 C	15.55 ± 3.59 C	< 25.15 C
pH	8.23 ± 0.39	7.88 ± 0.12	7.67 ± 0.49	Between 6.5-8.5
Conductivity	0.400 ± 0.10 spc	0.491 ± 0.09 spc	1.356 ± 2.21 spc	
Dissolved Oxygen	6.90 ± 1.06 mg/L	8.81 ± 0.97 mg/L	7.79 ± 4.20 mg/L	> 6.0 mg/L
Total Organic Nitrogen	0.762 ± 0.09 mg/L	0.586 ± 0.08 mg/L	1.108 ± 1.46 mg/L	< 1.1mg/L
Caffeine			0.0158 µg/L	

Unlike all other sites being monitored the water chemistry at Swan Lake Drain appears to have decreased substantially during the summer of 2015. Of particular note is the increase in total suspended solids, total phosphorus, and total organic nitrogen levels in this stream, increasing by 379%, 461%, and 90% respectively from 2014 to 2015. These increases in sediments and nutrients renders many of this stream`s water chemistry parameters above recommended standards to limit the growth of nuisance vegetation and minimize disturbance on fish populations. That said, these high values are predominately driven by two storm events sampled in August and October 2015, where total suspended solids, total phosphorus and total organic nitrogen levels were uncharacteristically high. Water samples taken prior to July 2015 were closer in quality to values reported throughout the 2013 and 2014 seasons.

The high suspended solids, total phosphorus, and total organic nitrogen values reported in August and October 2015 also coincide with exceptionally high chloride values (89.6 mg/L and 1530 mg/L respectively). These uncommonly high chloride values suggest two possible explanations for the decreased water chemistry. Water at this site may have been highly limited, with the remaining water undergoing strong evaporation pressures. As the reported measures are concentrations a reduction in water would inherently increase the apparent amount of nitrogen, phosphorus, or sediments per litre of water. Alternatively, this increase in chloride may be evidence of an additional external human disturbance at this stream that does not involve cattle activity. The caffeine measured at this location does indicate local septic systems are impacting this stream, but septic systems are an unlikely driver of the August and October 2015 water chemistry.