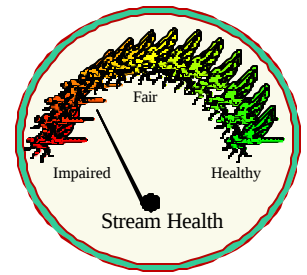




EcoSummary

Wakulla Springs

02/27/2001



Background

Florida DEP has been conducting quarterly sampling in the St. Mark's River Basin in conjunction with the Northwest Florida Water Management District. One of the sampling sites in that project is the Wakulla River within the boundaries of Wakulla Springs State Park, just below the tour boat turn-around area. Data from these efforts will be used for documenting conditions within the basin and for making resource protection decisions. Wakulla Springs State Park is located in Wakulla County, Florida; see Figure 1. The Wakulla River begins in the park, flows south, and joins the St. Mark's River before flowing into the Gulf of Mexico. Wakulla Springs is a Floridan Aquifer-dominated system and is known for its recreational and aesthetic qualities.

Wakulla Springs was sampled on February 27, 2001. Water chemistry samples were taken for ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN), ortho-phosphate, total phosphorus, *Enterococci*, *Escherichia coli*, fecal coliform, total coliform, and other analyses; see Figure 2. Due to meter and contamination problems, dissolved oxygen and nitrate-nitrite concentrations are not available from this sampling event. Habitat assessment, qualitative periphyton sampling, and benthic invertebrate stream condition index (SCI) sampling were conducted.

Results

Ammonia, TKN, ortho-phosphate, and total phosphorus concentrations were low; see Figure 2. Note that the sampling site is approximately a mile downstream from the spring boil, and nutrients there are expected to be lower than those at the boil due to uptake by the copious growth of vegetation in the river. Although the data are not available for this sampling event, nitrate-nitrite concentration is known to be very elevated in Wakulla Springs. The habitat assessment total score (114) at Wakulla Springs below the tour boat turn-around was in the sub-optimal category in February 2000. This score was largely due to the overwhelming dominance of the invasive exotic submerged plant *Hydrilla*. The explosive *Hydrilla* growth has been fueled by high nitrate concentrations. *Hydrilla* degrades the river in several ways, including physical smothering of habitat and silt build-up from its decomposition.

In February 2001, *Enterococci* concentration (<1 col/100 mL) was below the EPA single-sampling guideline value of 61 col/100 mL for designated beach areas. *Escherichia coli* concentration (8 col/100 mL) was below the EPA single-sampling designated beach guideline value of 235 col/100 mL. Fecal and total coliform levels were well below the Class III water quality standards.

The stream condition index (SCI) ranked the site "poor" in February 2001; see Figure 2. The periphyton community in Wakulla

Springs was dominated by taxa tolerant of nutrient enriched conditions. In conclusion, the poor health of the macroinvertebrate community was related to habitat and other problems caused by the *Hydrilla*, which in turn was due to high nitrate levels. The periphyton community also reflected nutrient enrichment.

Figure 1: Overview Map

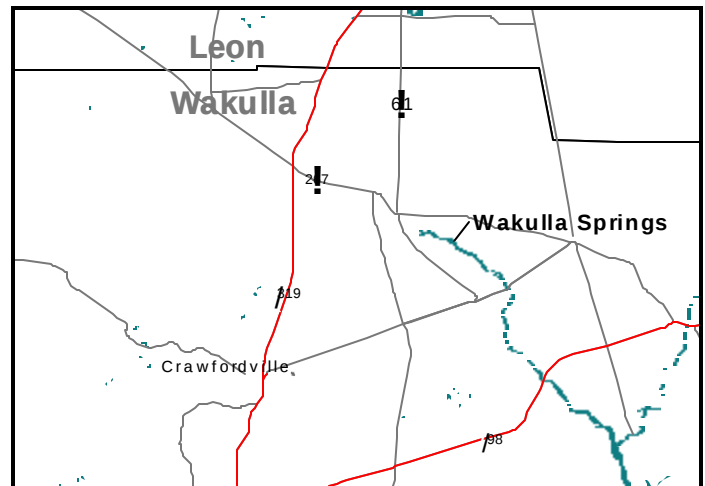


Figure 2: Data Table

Station		Wakulla at State Park	
STORET		STMARKSSTORET01	
Sampling Date		2/27/2001	
Physical-Chemical Data			
Habitat Assessment		114	
Sample Depth (m)		0.4	
Specific Conductance (umho/cm)		330	
pH (SU)		8.4	
Temperature (deg. C)		21.8	
Macroinvertebrate Data		Periphyton Data	
SCI	15	Number of Taxa	21
Panhandle East Evaluation	poor	% Bacillariophyceae	90.84
Number of Taxa	15	% Chlorophyceae	0.54
EPT Index	0	% Cyanophyceae	8.62
% Contribution Dominant Taxon	49.52	% Contribution Dominant Taxon	35.73
Florida Index	2	Nutrient Data	
% Diptera	13.33	Ammonia (mg/L)	0.01 I
Number of Chironomidae Taxa	0	TKN (mg/L)	0.091 I
Number of Orthoclaadiinae Taxa	5	Ortho-Phosphate (mg/L)	0.028
Total Number Chironomidae Taxa	5	Total Phosphorus (mg/L)	0.027 I
% Filter Feeders	2.86	Algal Growth Potential (mg Dry Wt/L)	0.1 U
Bacteria Data		Alkalinity (mg/L)	130
Enterococci (col/100 mL)	1 K	TOC (mg/L)	1 I
Escherichia coli (col/100 mL)	8	TDS (mg/L)	195
Fecal Coliforms (col/100 mL)	14	TSS (mg/L)	4 U
Total Coliforms (col/100 mL)	40	Turbidity (NTU)	0.25

"I"-Below Quantitation Limit; "K"- Actual Value is Less Than Value Given;

"U"- Below Detection Limit



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