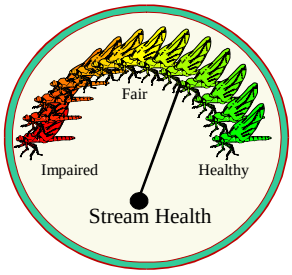


EcoSummary

Wakulla Springs

2/3/2004



Background

The Florida DEP Bureau of Laboratories conducts quarterly sampling of the Wakulla River within the boundaries of Wakulla Springs State Park, at a site located just below the tour boat turn-around area. Data from these efforts is used for documenting conditions within the river 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 Floridian Aquifer-dominated system and is known for its recreational and aesthetic qualities.

Wakulla Springs was sampled on February 3, 2004 as part of the quarterly monitoring program and to determine the long-term results of Aquathol® herbicide treatments. Water chemistry samples were collected for ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN), total phosphorus, Enterococci, Escherichia coli, fecal coliform, total coliform, and other analyses; see Figure 2. Habitat assessment, qualitative periphyton sampling, and benthic invertebrate stream condition index (SCI) sampling were also conducted.

Figure 1: Overview Map of the Wakulla Springs Area



Results

Ammonia, TKN, and total phosphorus concentrations continue to remain near minimum detection limits; see Figure 2. The nitrate-nitrite concentration (0.52 mg/L) remains higher than the values found in approximately 85% of Florida streams. Since the sampling site is about a mile downstream from the spring boil, nutrients are expected to be lower than those at the boil due to uptake by the heavy growth of vegetation in the river.

In February 2004, Enterococci (4 CFU/100 mL) and Escherichia coli (2 CFU/100mL) densities were below the EPA single sampling guideline for designated beach areas. Fecal and total coliform levels complied with Class III water quality standards.

The overall habitat assessment score (135) was in the "optimum" range. Substrate diversity and habitat smothering continued to be the habitat-oriented parameters of concern at Wakulla Springs.

The SCI score (25) for Wakulla Springs was in the "good" range. It's possible that the SCI score at Wakulla Springs may be related to *Hydrilla* density; see Figure 3. Elevated coverage of *Hydrilla* tends to smother invertebrate habitats, while the respiration and decomposition of the plant biomass reduces diel dissolved oxygen. Aquathol® herbicide, applied to control the growth of *Hydrilla,* appears to temporarily improve habitat, allowing a healthier invertebrate community to develop.

Diatoms dominated the periphyton community. Pollution tolerant blue green algal taxa were very rare.

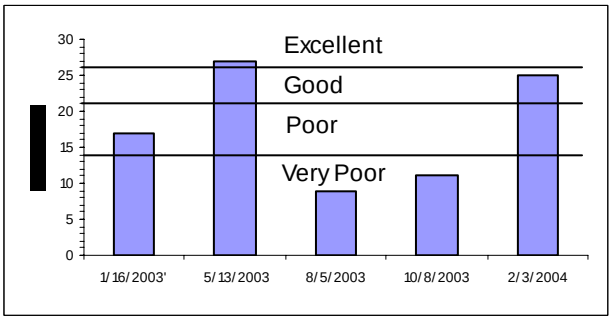
In conclusion, macroinvertebrate community health was improved when compared to the past two samplings, potentially related to habitat and dissolved oxygen improvements associated with *Hydrilla* control.

Figure 2: Sample Data Table

Wakulla Springs			
Sampling Date		February 3, 2004	
Macroinvertebrate Parameters		Periphyton Parameters	
SCI Score	25	% Bacillariophyceae	88.85
SCI Evaluation	Good	% Chlorophyceae	0
Number of Taxa	28	% Cyanophyceae	10.49
EPT Index	4	Dominant Taxa	None
Florida Index	8	% Contribution Dominant Taxon	12.79
% Contribution Dominant Taxon	30	Physical-Chemistry Parameters	
% Diptera	44	Habitat Assessment Score	135
Total Number Chironomidae Taxa	13	Specific Conductance (umhos/cm)	292
%Filter-Feeders	12	Dissolved Oxygen (mg/L)	4.1
Chemistry Data		pH (SU)	7.36
Ammonia (mg N/L)	0.01 U	Temperature (deg C)	20.78
Nitrate-Nitrite (mg N/L)	0.52	Bacteria Parameters	
TKN (mg/L)	0.065 I	Enterococci (colonies/100ml)	4
Total Phosphorus (mg P/L)	0.028 I	Eschericia coli (colonies/100ml)	2
Color (PCU)	5 U	Fecal Coliforms (colonies/100ml)	4
Turbidity (NTU)	0.25	Total Coliforms (colonies/100ml)	10

"U"=Below detection limit; "I"=Below practical quantitation limit

Figure 3: Stream Condition Index Scores Over Time



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