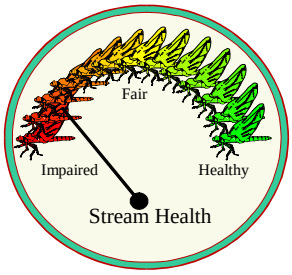


EcoSummary

Wakulla Springs
7/26/2004



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 July 26, 2004. Water chemistry samples were collected for ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN), total phosphorus, *Escherichia coli*, *Enterococci*, fecal coliform, total coliform, and other analyses; see Figure 2. Habitat assessment and benthic macroinvertebrate stream condition index (SCI) sampling were also conducted.

Figure 1: Overview Map of the Wakulla Springs Area



Results

The nitrate-nitrite concentration in Wakulla Springs (0.58-0.60 mg/L) was higher than values found in 80% of Florida streams (0.35 mg/L); see Figure 2. Ammonia and TKN levels were below detection limits. The total phosphorus concentration was below practical quantitation limits. 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 abundant growth of vegetation in the river.

The overall habitat assessment score (139) was in the "optimal" range. *Enterococci* and *Escherichia coli* concentrations were below the EPA single-sample guideline values of 61 CFU/100 mL and 235 CFU/100 mL, respectively, for "designated beach areas." Fecal and total coliform levels complied with Class III water quality standards.

The SCI was recently recalibrated in order to make it a more effective tool for evaluating ecological health of streams. The sampling method remained the same; only the index calculation was changed. The recalibrated SCI tends to produce a more stringent evaluation, since two poorly performing metrics from the old SCI were discarded (% Diptera and number of Chironomid taxa). Five additional metrics correlated with human disturbance were added, for a new total of ten metrics. The ten metrics are: total taxa, Ephemeroptera taxa, Trichoptera taxa, percent filterers, long-lived taxa, clinger taxa, percent dominance, percent Tanytarsini, sensitive taxa, and percent very tolerant taxa. More details can be found in the FDEP Standard Operating Procedures, LT 7200. The recalibrated SCI went into effect June 8, 2004. SCI samples collected after that time may yield different results from prior evaluations.

The SCI score (25) for Wakulla Springs was in the "poor" range. The SCI scores at Wakulla Springs are potentially related to *Hydrilla* density, with better SCI scores associated with times when the *Hydrilla* density is reduced. Invertebrate species richness tends to fluctuate between 10 and 30 taxa; see Figure 3. In conclusion, elevated nitrate-nitrite concentration, poor macroinvertebrate community health, and *Hydrilla* control were the issues of concern in Wakulla Springs.

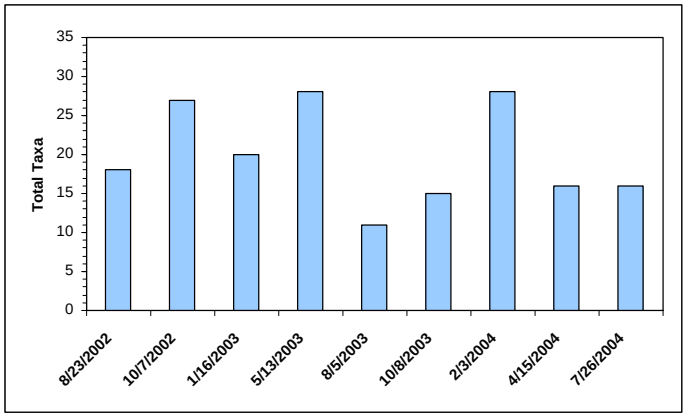
Figure 2: Data Table

WAKULLA SPRINGS		
Sampling Date	7/26/2004	
Macroinvertebrate Data		
SCI Score	25	
SCI Evaluation	Poor	
Chemistry Data		
	replicate 1	replicate 2
Turbidity (NTU)	0.4	0.2
Color (PCU)	10	10
Ammonia (mg/L)	0.01 U	0.01 U
Nitrate-Nitrite (mg/L)	0.60	0.58
TKN (mg/L)	0.12 U	0.12 U
Total Phosphorus (mg/L)	0.025 I	0.034 I
Physical-Chemical Data		
Habitat Assessment Score	139	
Temperature (deg. C)	21.5	
pH	7.7	
Dissolved Oxygen (mg/L)	4.4	
Specific Conductance (umhos/cm)	300	
Bacteria Data		
	replicate 1	replicate 2
Escherichia coli (col/100 mL)	15 B	10 B
Enterococci (col/100 mL)	17 B	8 B
Fecal Coliforms (col/100 mL)	18 B	30 B
Total Coliforms (col/100 mL)	250	200

"U"=Below detection limit; "I"=Below practical quantitation limit; "B"=Results based on colony counts outside the acceptable range

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Figure 3: Total Number of Macroinvertebrate Taxa Over Time



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