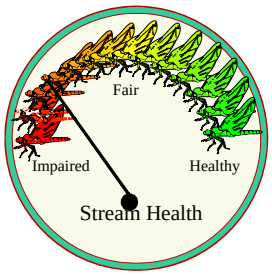


EcoSummary



Volusia Blue Springs

11/1/2006

Background

Florida DEP's Division of Recreation and Parks selected Blue Springs for biological and water quality monitoring. Data from these efforts will be used for documenting conditions within the park and for making resource protection decisions. Blue Springs State Park is located in Volusia County, Florida; see Figure 1. Blue Springs Run flows south for approximately 1000 m into the St. Johns River. Blue Springs is a Floridan Aquifer-dominated system and is known for its recreational and aesthetic qualities.

Blue Springs was sampled on November 1, 2006. Water chemistry samples were taken for ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN), total phosphorus, color, turbidity, *Enterococci*, *Escherichia coli*, fecal coliform, and total coliform analysis; see Figure 2. Habitat assessment and benthic macroinvertebrate Stream Condition Index (SCI) sampling were also conducted.

Figure 1: Map of the Blue Springs Area



Results

The nitrate-nitrite concentration (0.42 mg/L) at the sampling site was higher than the values found in 80% of typical Florida streams (0.32 mg/L or less). Elevated nitrate-nitrite levels at Blue Springs are related to nitrogen loading in the recharge basin. The total phosphorus and ammonia concentrations were both slightly lower than average compared to typical Florida streams. The TKN concentration was very low compared to Florida streams.

The *Enterococci* and *Escherichia coli* concentrations complied with the EPA single-sampling 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 thresholds for interpreting the Stream Condition Index values have recently been revised according to the EPA Biological Condition Gradient (BCG) conceptual model. In addition, the laboratory methodology used to evaluate the macroinvertebrate samples taken for the SCI was also revised to reduce uncertainty associated with SCI results. In the SCI 2004 method, a single group of 100 individuals was sub-sampled, identified, and scored, while in the new SCI 2007 method, two separate groups of 150 individuals are analyzed, and the two resulting SCI scores are averaged. The SCI 2007 produces a more robust evaluation since the decision thresholds are based on the BCG, and the examination of two separate aliquots reduces error. Note that the sampling method and the ten metrics used for calculating the score remain exactly the same. The SCI 2007 went into effect August 1, 2006.

The SCI score for Blue Springs (10) was in the "impaired" range, probably due to the naturally high conductivity and periodic low dissolved oxygen conditions characteristic of the spring run. The overall habitat assessment score (126) was in the "optimal" range, although algal smothering was an issue.

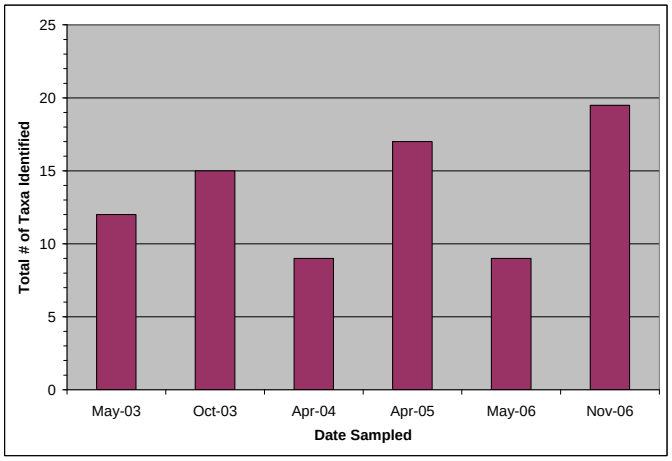
In conclusion, high nitrate-nitrite levels, lack of habitat availability for macroinvertebrates, and macroinvertebrate community health were the parameters of concern at Volusia Blue Springs.

Figure 2: Data Table

Volusia Blue Springs			
Sampling Date	11/1/2006	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	126
SCI Score	10	Temperature (deg. C)	23.0
SCI Evaluation	Impaired	pH	7.6
Chemistry Data		Dissolved Oxygen (mg/L)	4.6
Turbidity (NTU)	0.2	Specific Conductance (umhos/cm)	1597
Color (PCU)	5	**Bacteria Data**	
Ammonia (mg/L)	0.058	*Escherichia coli* (col/100 mL)	18 BQ
Nitrate-Nitrite (mg/L)	0.42	*Enterococci* (col/100 mL)	30 BQ
TKN (mg/L)	0.32	Fecal Coliforms (col/100 mL)	2 KQ
Total Phosphorus (mg/L)	0.078	Total Coliforms (col/100 mL)	50 Q

"B"= Based on colony counts outside the acceptable range; "K"= Actual value is known to be less than value given; "Q"= Outside of holding time

Figure 3: Total Macroinvertebrate Taxa Over Time



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