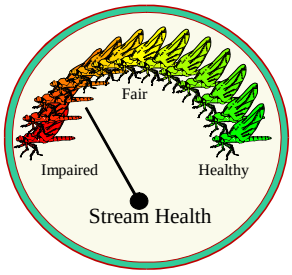


EcoSummary

Blue Hole Springs

5/10/2007

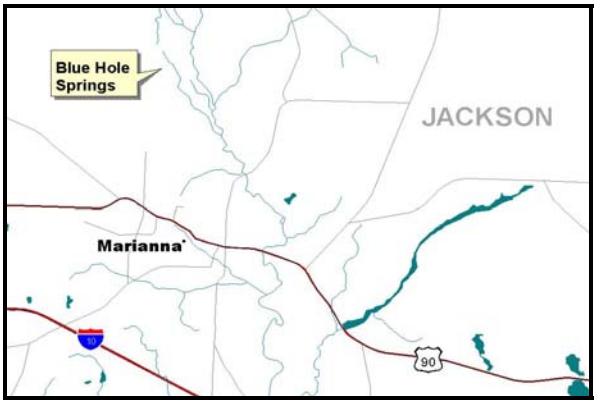


Background

The Florida Department of Environmental Protection's Division of Recreation and Parks selected Blue Hole Springs, along with many other springs from state parks, for biological and water quality monitoring. Data from these efforts will be used for documenting conditions within each park and for making resource protection decisions. Blue Hole Springs is located in Florida Caverns State Park in Jackson County; see Figure 1. Blue Hole Springs Run flows into the Chipola River.

Samples were collected from Blue Hole Springs on May 10, 2007. Water chemistry samples were taken for ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN), total phosphorus, Escherichia coli, Enterococci, fecal coliform, and total coliform analyses; see Figure 2. Habitat assessment, qualitative periphyton sampling, and benthic macroinvertebrate Stream Condition Index (SCI) sampling were conducted.

Figure 1: Map of the Blue Hole Springs Area



Results

The nitrate-nitrite concentration (0.32 mg/L) in Blue Hole Springs was equal to the value found in 80 % of Florida streams, but was lower than that found in most Florida springs. Total phosphorus and TKN concentrations were below their respective Practical Quantitation Limit. The ammonia concentration was below the Method Detection Limit.

Enterococci and *Escherichia coli* concentrations complied with 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 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 of 26 for Blue Hole Springs was in the "Impaired" range, partially due to the Habitat Assessment score (112), which was in the "suboptimal" range. Low velocity and habitat smothering were issues of concern. Macroinvertebrate taxa richness has not changed significantly over time (see Figure 3). The periphyton community was dominated by diatoms, with some blue-green and green algal taxa.

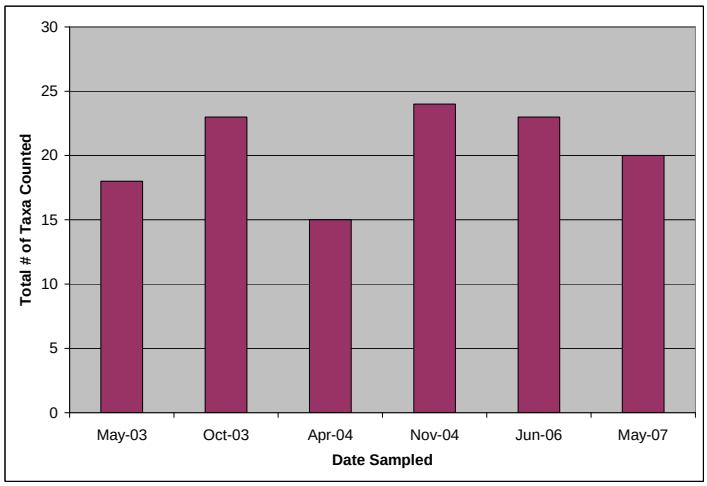
In conclusion, the low Habitat Assessment and SCI scores were the main parameters of concern in Blue Hole Springs.

Figure 2: Data Table

Blue Hole Springs			
Sampling Date	5/10/2007	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	112
SCI Score	26 A	Temperature (deg. C)	21.7
SCI Evaluation	Impaired	pH	6.98
Chemistry Data		Dissolved Oxygen (mg/L)	9.0
Turbidity (NTU)	3.6	Specific Conductance (umhos/cm)	308
Color (PCU)	20	**Bacteria Data**	
Ammonia (mg/L)	0.05 U	*Escherichia coli* (col/100 mL)	76
Nitrate-Nitrite (mg/L)	0.32	*Enterococci* (col/100 mL)	42
TKN (mg/L)	0.12 I	Fecal Coliforms (col/100 mL)	92
Total Phosphorus (mg/L)	0.032 I	Total Coliforms (col/100 mL)	198 B

"U"=Below Method Detection Limit; "I"=Below Practical Quantitation Limit; "B"=Results based on colony counts outside the acceptable range; "A"= Value reported is the average of two or more determinations

Figure 3: Total Macroinvertebrate Taxa Over Time



FOR MORE INFORMATION, CONTACT:
Emily Peffer, FDEP Environmental Assessment Section
2600 Blair Stone Road MS#6511 Tallahassee, FL 32399-2400
(850) 245-8071 Emily.Peffer@dep.state.fl.us