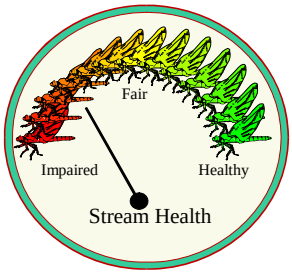


EcoSummary

Blue Hole Springs

10/26/2007

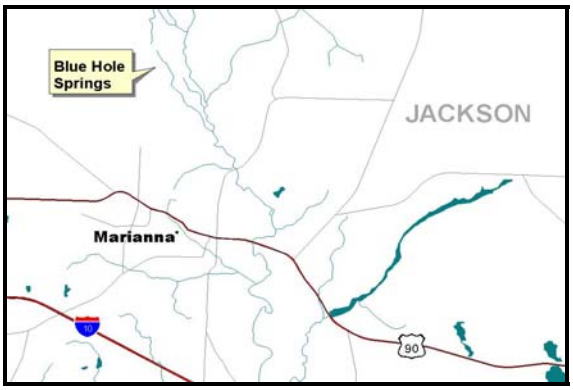


Background

The Florida Department of Environmental Protection's Division of Recreation and Parks selected Blue Hole Springs for biological and water quality monitoring. Data from these efforts will be used 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 October 26, 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 (0.33 mg/L) in Blue Hole Springs was higher than typical values found in 80% of Florida streams, but lower than most springs. Total phosphorus and TKN concentrations were below the Practical Quantitation Limits. The ammonia concentration (0.05 mg/L) was less than average values for typical Florida streams.

Enterococci and *Escherichia coli* concentrations complied with the EPA single-sample guideline values 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 33 for Blue Hole Springs was in the "Impaired" range (1 point below the threshold). The Habitat Assessment score (107) was in the "Suboptimal" range, with low velocity and habitat smothering contributing to the lowered score. Macroinvertebrate taxa richness was higher than for previous sampling events (see Figure 3). The periphyton community was dominated by diatoms, with some blue-green and green algal taxa.

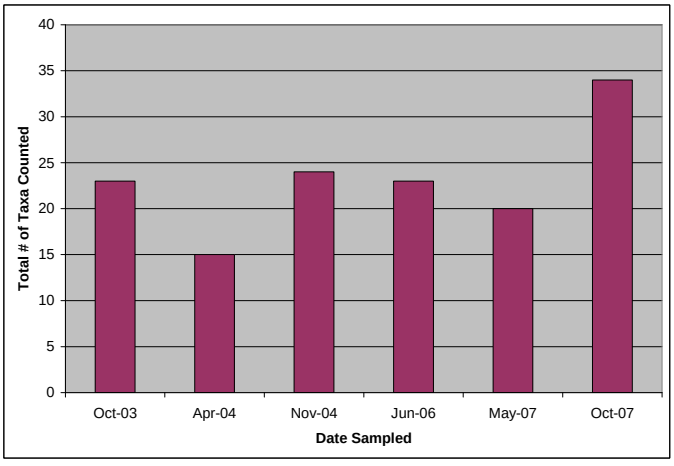
In conclusion, the low Habitat Assessment and SCI scores were the main parameters of concern in Blue Hole Springs.

Figure 2: Data Table

Blue Hole Springs			
Sampling Date	10/26/2007	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	107
SCI Score	33 A	Temperature (deg. C)	18.83
SCI Evaluation	Impaired	pH	7.3
Chemistry Data		Dissolved Oxygen (mg/L)	4.7
Turbidity (NTU)	4.4	Specific Conductance (umhos/cm)	288
Color (PCU)	10	**Bacteria Data**	
Ammonia (mg/L)	0.05	*Escherichia coli* (col/100 mL)	42
Nitrate-Nitrite (mg/L)	0.33	*Enterococci* (col/100 mL)	36 B
TKN (mg/L)	0.14 I	Fecal Coliforms (col/100 mL)	28 B
Total Phosphorus (mg/L)	0.027 I	Total Coliforms (col/100 mL)	120

"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



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