EcoSummary

Alexander Springs

5/16/2007

Background

Florida DEP's Division of Water Resource Management selected Alexander Springs for biological and water quality monitoring as part of the Springs Initiative. Data from these efforts will be used for documenting conditions within springs throughout Florida and for making resource protection decisions. Alexander Springs Recreation Area is located in Lake County, Florida, in the Ocala National Forest; see Figure 1. Alexander Springs flows into the St. John's River and is a popular recreation area.

Samples were collected from Alexander Springs on May 16, 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 and benthic macroinvertebrate Stream Condition Index (SCI) sampling were also conducted.

Figure 1: Map of the Alexander Springs Area



Results

The nitrate-nitrite concentration for Alexander Springs (0.017 mg/L) was lower than average for typical Florida streams and much lower than most Florida springs. TKN was very low compared to typical Florida streams. The total phosphorus concentration was below the Practical Quantitation Limit., and ammonia was undetected.

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. In Figure 3, the new thresholds have been retroactively applied to the scores acquired before this date.

The SCI score of 14 for Alexander Springs was in the "Impaired" range; this was probably due to the high conductivity at the site (1087 umhos/cm). The high conductivity (somewhat "salty" water) in Alexander Springs is a natural condition. However, this high conductivity will limit the diversity of freshwater organisms that can inhabit the site. The overall Habitat Assessment score (110) was in the "Sub- optimal" range, partially due to algal smothering (despite the very low nutrients).

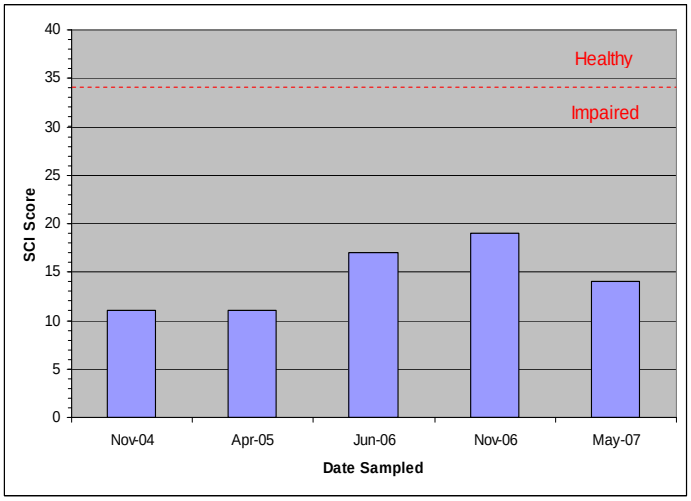
In conclusion, a limited macroinvertebrate community, probably related to high conductivity and habitat smothering, continued to be observed in Alexander Springs.

Figure 2: Data Table

ALEXANDER SPRINGS			
Sampling Date	5/16/2007	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	110
SCI Score	14 A	Temperature (deg. C)	23.5
SCI Evaluation	Impaired	pH	7.99
Chemistry Data		Dissolved Oxygen (mg/L)	0.39
Turbidity (NTU)	0.20	Specific Conductance (umhos/cm)	1087
Color (PCU)	5	**Bacteria Data**	
Ammonia (mg/L)	0.01 U	*Escherichia coli* (col/100 mL)	2 UQ
Nitrate-Nitrite (mg/L)	0.017	*Enterococci* (col/100 mL)	2 BQ
TKN (mg/L)	0.23	Fecal Coliforms (col/100 mL)	4 BQ
Total Phosphorus (mg/L)	0.038 I	Total Coliforms (col/100 mL)	14 BQ

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

Figure 3: SCI Scores Over Time



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