EcoSummary

Silver River Springs

10/31/2007

Background

Florida DEP's Division of Water Resource Management selected Silver River Spring for biological and water quality monitoring. Data from these efforts will be used for documenting conditions within the spring run and for making resource protection decisions. Silver River Springs is located northeast of Ocala in Marion County, Florida (Figure 1). The Silver River, which flows into the Ocklawaha River, is a Floridan Aquifer-dominated system known for its recreational and aesthetic qualities.

Samples were collected from Silver River Springs on October 31, 2007. Water chemistry samples were taken for ammonia, nitrate-nitrite, total Kjeldahl nitrogen, total phosphorus, color, turbidity, *Enterococci*, *Escherichia coli*, fecal coliform, and total coliform analysis (Figure 2). Habitat Assessment and benthic invertebrate Stream Condition Index (SCI) sampling were also conducted.

Figure 1: Map of the Silver Springs Area



Results

The nitrate-nitrite concentration (1.3 mg/L) at the sampling site was higher than the values found in 95% of Florida streams (1.05 mg/L or less). Elevated nitrate-nitrite levels in Silver River Springs are related to nitrogen loading in the recharge basin. Ammonia and TKN concentrations were below method detection limits. Total phosphorus was below the practical quantitation limit. There were no results for bacterial analysis for this sampling event.

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.

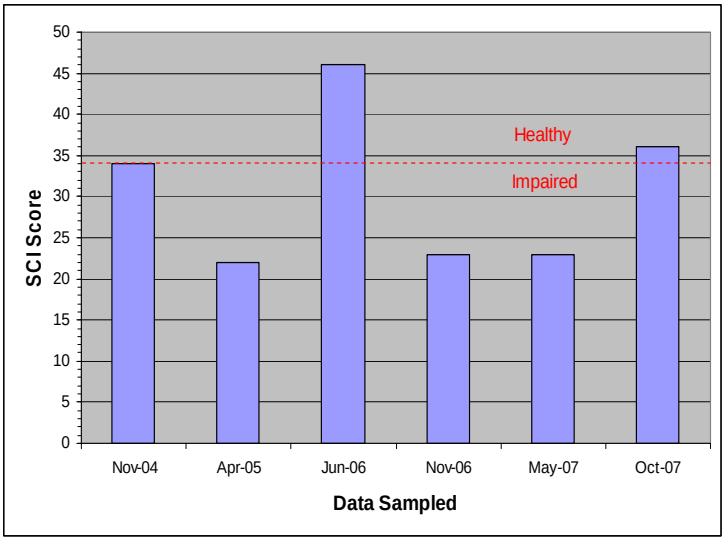
The SCI score of 36 was in the "healthy" range. The Habitat Assessment score (138) was in the "optimal" range. There is currently no explanation for the fluctuating SCI scores (above and below the impairment threshold) at this site. In conclusion, elevated nitrate-nitrite was the main issue of concern in Silver River Springs.

Figure 2: Data Table

SILVER RIVER SPRINGS			
Sampling Date	10/31/2007	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	138
SCI Score	36 A	Temperature (deg. C)	23.32
SCI Evaluation	Healthy	pH	7.17
Chemistry Data		Dissolved Oxygen (mg/L)	4.82
Turbidity (NTU)	0.10 Q	Specific Conductance (umhos/cm)	481
Color (PCU)	5 UQ	**Bacteria Data**	
Ammonia (mg/L)	0.010 U	*Escherichia coli* (col/100 mL)	No result, Q
Nitrate-Nitrite (mg/L)	1.3	*Enterococci* (col/100 mL)	No result, Q
TKN (mg/L)	0.080 U	Fecal Coliforms (col/100 mL)	No result, Q
Total Phosphorus (mg/L)	0.048 I	Total Coliforms (col/100 mL)	No result, Q

"I"= Below practical quantitation limit; "Q"=Outside of holding time; "U"=Below method detection limit; "A"= Value reported is the mean of two or more determinations

Figure 3: SCI Scores Over Time



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