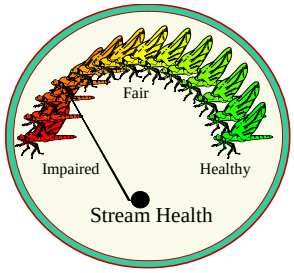
EcoSummary

Rock Springs

11/2/2006



Background

Florida DEP's Division of Water Resource Management selected Rock Springs 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. Rock Spring is located inside Kelly Park in Orange County, Florida (Figure 1). Rock Spring, which flows into the Wekiva River, is a Floridan Aquifer-dominated system known for its recreational and aesthetic qualities.

Rock Springs was sampled November 2, 2006, at a location downstream of the swimming area and springhead. Sampling at the upper portion of the spring was discontinued because this location was physically disturbed from recreational activities.

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 (Figure 2). Habitat assessment and benthic invertebrate Stream Condition Index (SCI) sampling were also conducted.

Figure 1: Overview Map of the Rock Springs Area



Results

The nitrate-nitrite concentration at the sampling site (1.3 mg/L) was higher than typical values found in 95% of Florida streams (1.05 mg/L or less). Elevated nitrate-nitrite levels in Rock Springs are related to nitrogen loading in the recharge basin. The TKN and ammonia concentrations were below method detection limits. The total phosphorus concentration was slightly less than average compared to typical FL streams.

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 17 for Rock Springs was in the "impaired" category. This is unexplained, since the Habitat Assessment score of 125 was in the "optimal" category, and water quality was not dissimilar from the sampling events when the SCI was in the "healthy" category.

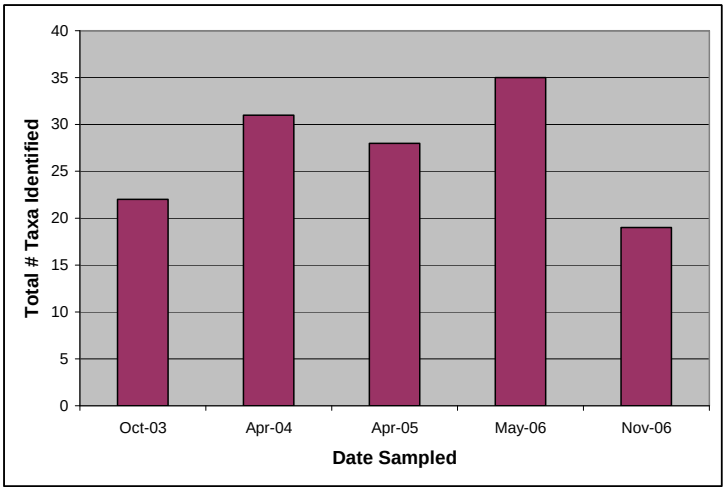
In conclusion, the elevated nitrate-nitrite concentration and poor macroinvertebrate community health were parameters of concern in Rock Springs.

Figure 2: Data Table

Rock Springs			
Sampling Date	11/2/2006	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	125
SCI Score	17 A	Temperature (deg. C)	23.9
SCI Evaluation	Impaired	pH	7.8
Chemistry Data		Dissolved Oxygen (mg/L)	7.2
Turbidity (NTU)	0.20	Specific Conductance (umhos/cm)	258
Color (PCU)	5	**Bacteria Data**	
Ammonia (mg/L)	0.010 U	*Escherichia coli* (col/100 mL)	82 Q
Nitrate-Nitrite (mg/L)	1.3	*Enterococci* (col/100 mL)	56 Q
TKN (mg/L)	0.080 U	Fecal Coliforms (col/100 mL)	42 Q
Total Phosphorus (mg/L)	0.094 A	Total Coliforms (col/100 mL)	208 BQ

"U"=Below detection limit; "B"=Based on colony counts outside the acceptable range; "Q"=Outside of holding time; "A"=Average value

Figure 3: Total Macroinvertebrate Taxa Over Time



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