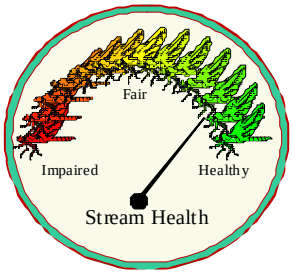


EcoSummary

Rainbow Springs

11/1/2007



Background

Florida DEP's Division of Recreation and Parks selected Rainbow Springs for biological and water quality monitoring. Data from these efforts will be used for documenting conditions within the park and for making resource protection decisions. Rainbow Springs State Park is located in Marion County, Florida; see Figure 1. The Rainbow River begins in the park from numerous spring vents and then flows south into the Withlacoochee River. Rainbow Springs is a Floridan Aquifer-dominated system and is known for its recreational and aesthetic qualities. Water quality characteristics vary from spring vent to spring vent, so a sampling location in the spring run was selected to document overall conditions.

Samples were collected at Rainbow Springs on November 1, 2007. 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; see Figure 2. Habitat assessment and benthic invertebrate Stream Condition Index (SCI) sampling were also conducted.

Figure 1: Map of the Rainbow Springs Area



Results

The nitrate-nitrite concentration (1.8 mg/L) in Rainbow Springs was higher than the values found in 95% of Florida streams (1.05 mg/L or less). Elevated nitrate-nitrite levels in Rainbow Springs are related to nitrogen loading in the recharge basin. Ammonia and TKN were below Method Detection Limits. The total phosphorus concentration was below the Practical Quantitation Limit.

Enterococci and *Escherichia coli* concentrations were below 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.

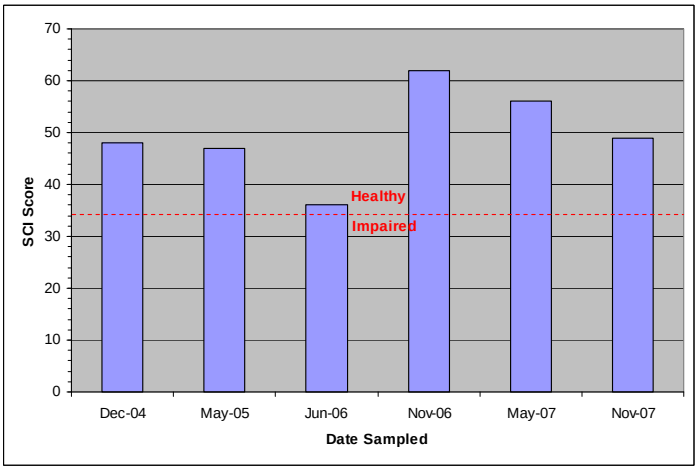
The SCI score (49) for this sampling event was in the "healthy" range, as the previous 5 samplings have been. The Habitat Assessment score (144) continued to be in the "optimal" range. In conclusion, while the elevated nitrate-nitrite concentration continues to be the main issue of concern in Rainbow Springs, biological health remains good.

Figure 2: Data Table

Rainbow Springs			
Sampling Date	11/1/2007	**Physical-Chemical Data**	
Macroinvertebrate Data		Habitat Assessment Score	144
SCI Score	49 A	Temperature (deg. C)	22.97
SCI Evaluation	Healthy	pH	7.52
Chemistry Data		Dissolved Oxygen (mg/L)	6.51
Turbidity (NTU)	0.1	Specific Conductance (umhos/cm)	235
Color (PCU)	5 U	**Bacteria Data**	
Ammonia (mg/L)	0.01 U	*Escherichia coli* (col/100 mL)	6 BQ
Nitrate-Nitrite (mg/L)	1.8	*Enterococci* (col/100 mL)	16 BQ
TKN (mg/L)	0.08 U	Fecal Coliforms (col/100 mL)	6 BQ
Total Phosphorus (mg/L)	0.022 I	Total Coliforms (col/100 mL)	78 Q

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

Figure 3: Stream Condition Index Scores 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