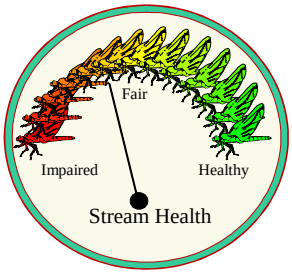


EcoSummary

Rainbow Springs
12/7/2004



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 Springs 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 December 7, 2004. 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: Overview Map of the Rainbow Springs Area



Results

The nitrate-nitrite concentration (1.4 mg/L) in Rainbow Springs continued to be higher than the values found in 95% of Florida streams (0.9685 mg/L). Both the TKN concentration (0.06 mg/L) and the ammonia concentration (0.01 mg/L) were below detection limits. The total phosphorus concentration (0.061 mg/L) was higher than values found in 40% of Florida streams.

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 SCI was recently recalibrated in order to make it a more effective tool for evaluating ecological health of streams. The sampling method remained the same; only the index calculation was changed. The recalibrated SCI tends to produce a more stringent evaluation, since two poorly performing metrics from the old SCI were discarded (% Diptera and number of chironomid taxa). Five additional metrics correlated with human disturbance were added, for a new total of ten metrics. The ten metrics are: total taxa, Ephemeroptera taxa, Trichoptera taxa, percent filterers, long-lived taxa, clinger taxa, percent dominance, percent Tanytarsini, sensitive taxa, and percent very tolerant taxa. More details can be found in the FDEP Standard Operating Procedures, LT 7200. The recalibrated SCI went into effect June 8, 2004, when the FDEP Quality Assurance Rule was finalized. SCI samples collected after that time may yield different results from prior evaluations.

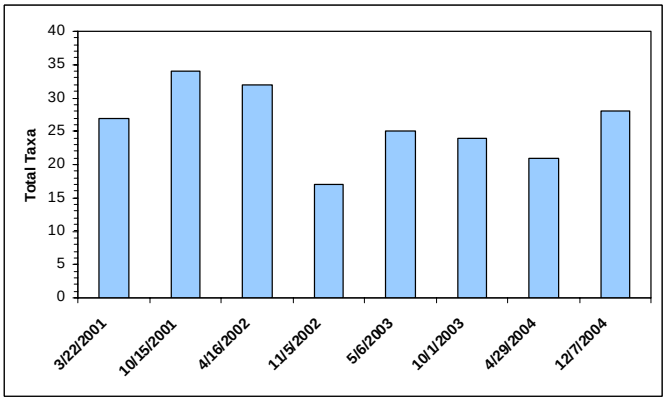
The overall habitat assessment score (131) was in the "optimal" range. Using the new 2004 SCI Index, the SCI score of 48 at Rainbow Springs was in the "fair" range. Although the SCI evaluation was recalibrated, the macroinvertebrate assemblage, as measured by overall taxa richness, has not significantly changed over the past two years; see Figure 3. In conclusion, an elevated nitrate-nitrite concentration continued to be an issue of concern in Rainbow Springs.

Figure 2: Data Table

RAINBOW SPRINGS			
Sampling Date	12/7/2004	**Physical-Chemical Data**	
Macroinvertebrate Data		Habitat Assessment Score	131
SCI Score	48	Dissolved Oxygen (mg/L)	6.9
SCI Evaluation	Fair	Temperature (deg. C)	22.8
Chemistry Data		pH	6.67
Turbidity (NTU)	0.1	Specific Conductance (umhos/cm)	212
Color (PCU)	5 U	**Bacteria Data**	
Ammonia (mg/L)	0.01 U	*Escherichia coli* (col/100 mL)	2 AKQ
Nitrate-Nitrite (mg/L)	1.4 A	*Enterococci* (col/100 mL)	5 ABQ
TKN (mg/L)	0.06 U	Fecal Coliforms (col/100 mL)	4 ABQ
Total Phosphorus (mg/L)	0.061	Total Coliforms (col/100 mL)	11 ABQ

"A"=Average value of more than one determination; "Q"=Outside of holding time;
"I"=Below practical quantitation limit; "U"=Below detection limit;
"B"=Results based on colony counts outside the acceptable range;
"K"=Actual value known to be less than this result

Figure 3: Total Number of Macroinvertebrate Taxa



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