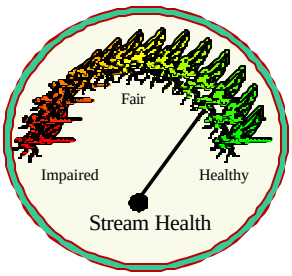


EcoSummary

Rainbow Springs
10/15/01 and 11/02/01



Background

Florida DEP's Division of Recreation and Parks selected Rainbow Springs, as well as several other springs from state parks, for biological and water quality monitoring. Data from these efforts will be used for documenting conditions within each park and for making resource protection decisions. Rainbow Springs State Park is located in Marion County, Florida (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 effects.

Samples were taken at Rainbow Springs in October and November 2001. 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, qualitative periphyton sampling, and benthic invertebrate stream condition index (SCI) sampling was also conducted.

Results

Nitrate-nitrite concentrations (1.1 mg/L) at the sampling site were higher than the values found in 95% of Florida streams (1.05 mg/L) (Figure 2). Elevated nitrite-nitrate levels in Rainbow Springs River are related to nitrogen loading in the recharge basin (mostly inorganic fertilizers applied to pasture). Ammonia, total Kjeldahl nitrogen, and total phosphorus concentration were below quantitation limits (Figure 2). The overall habitat assessment score (139) was in the optimal range (>120), with only water velocity receiving a marginal score. *Enterococci* and *E. coli* concentrations complied with the EPA designed beach area single sample guidelines of 61 CFU/100mL and 235 CFU/100mL, respectively. Fecal and total coliform levels complied with Class III water quality standards (800 CFU/100mL and 2400 CFU/100mL, respectively). The stream condition index (SCI) score of 27 for Rainbow Springs was in the "excellent" range. The periphyton community in Rainbow Springs was dominated by diatoms with some blue-green taxa. The particular taxa found were indicative of eutrophic conditions, which was not surprising given the nutrient enrichment in Rainbow Springs. In conclusion, although elevated nitrate-nitrite levels in Rainbow Springs may be associated with a relatively low-quality algal community, the overall health of the spring, as indicated by invertebrate communities, has remained in excellent condition.

Figure 1: Overview Map of the Rainbow Springs Area

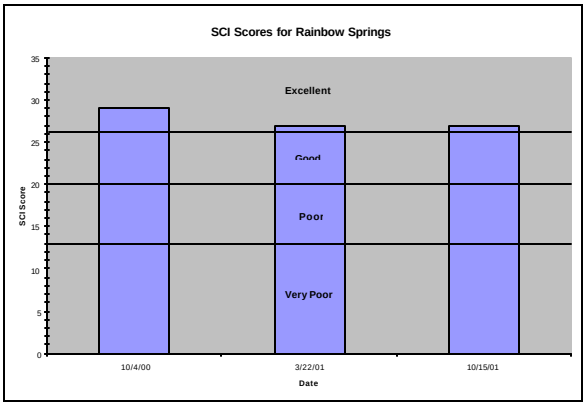


Figure 2: Data Table

Rainbow Springs			
Station		Rainbow Springs	
Sampling Date		10/15/01 and 11/02/01	
Macroinvertibrate Parameters		**Periphyton Parameters**	
SCI	27	% Bacillariophyceae	84.16
SCI Evaluation	Excellent	% Cyanophyceae	14.85
Number of Taxa	34	% Chlorophyceae	0.99
EPT Index	6	Dominant taxon	*Nitzschia amphibia*
FL Index	15	Percent Dominant taxon	35.97
% Dominant Taxon	39.34	**Physical-Chemical Data**	
% Diptera	64.34	Habitat Assessment	139
Total number of Chironomidae	12	Specific Conductivity (umhos/cm)	267
% Filter-Feeders	45.08	Dissolved Oxygen (mg/L)	7
Chemistry Data		pH (SU)	7.19
Ammonia (mg/L)	0.01 U	Temperature (deg C)	23.2
Nitrate-Nitrite (mg/L)	1.1	**Bacteria Parameters**	
TKN (mg/L)	0.06 U	*Enterococci* (col/100mL)	6 AQ
Total Phosphorus (mg/L)	0.025 I	*Escherichia coli* (col/100mL)	67 AQ
Color (PCU)	5 UQ	Fecal Coliforms (col/100 mL)	117 AQ
Turbidity	0.05 UQ	Total Coliforms (col/100mL)	210 AQ

"U"- Value Reported is the Minimum Detection Limit; "I"-Value Reported is Less Than the Minimum Detection Limit, and Greater Than or Equal to the Minimum; "Q"- Sample Held Beyond Normal Holding Time; "A"- Value Reported is the Mean of Two or More Determinations

Figure 3: SCI Scores Graph



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