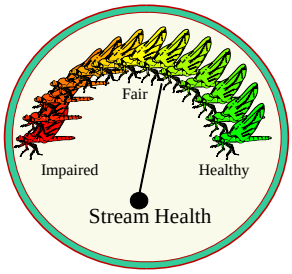


EcoSummary

Rainbow Springs
5/25/2005



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 in May 2005. 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 (1.6 mg/L) in Rainbow Springs was much higher than the values found in 95% of Florida streams (0.97 mg/L or lower). Elevated nitrate-nitrite levels in Rainbow Springs are related to nitrogen loading in the recharge basin. Ammonia and TKN were below 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 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.

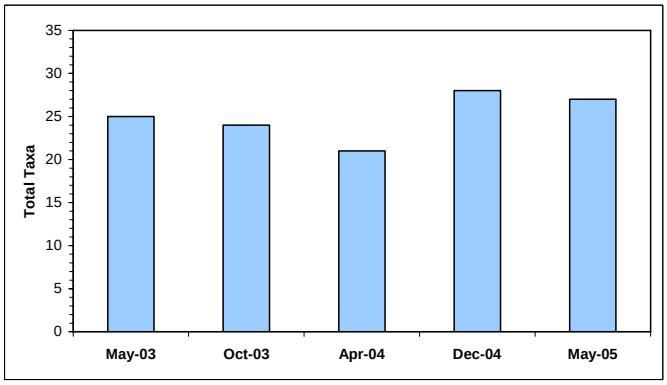
The overall habitat assessment score (140) was in the "optimal" range. The SCI score (47) was in the "fair" range. In conclusion, an elevated nitrate-nitrite concentration continued to be the issue of concern in Rainbow Springs.

Figure 2: Data Table

RAINBOW SPRINGS			
Sampling Date		5/25/2005	
Macroinvertebrate Data		**Physical-Chemical Data**	
SCI Score	47	Habitat Assessment Score	140
SCI Evaluation	Fair	Temperature (deg. C)	23.2
Chemistry Data		pH	7.6
Turbidity (NTU)	0.20	Specific Conductance (umhos/cm)	221
Color (PCU)	5 U	**Bacteria Data**	
Ammonia (mg/L)	0.01 U	*Escherichia coli* (col/100 mL)	2 K,Q
Nitrate-Nitrite (mg/L)	1.6	*Enterococci* (col/100 mL)	4 B,Q
TKN (mg/L)	0.06 U	Fecal Coliforms (col/100 mL)	2 B,Q
Total Phosphorus (mg/L)	0.028 I	Total Coliforms (col/100 mL)	28 B,Q

"U"=Below detection limit; "I"=Below practical quantitation limit; "B"=Based on colony counts outside the acceptable range; "K"=Actual value is known to be less than value given; "Q"=Outside of holding time

Figure 3: Total Number of Macroinvertebrate Taxa Over Time



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