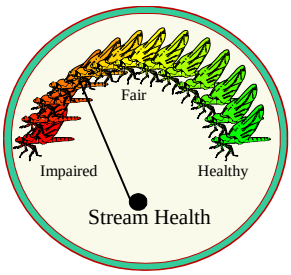


EcoSummary

Manatee Springs

11/1/2007



Background

Florida DEP's Division of Recreation and Parks selected Manatee 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. Manatee Springs, a Floridan Aquifer-dominated system, known for its recreational and aesthetic qualities, is located in Levy County, Florida; see Figure 1.

Samples were collected from Manatee Springs on November 1, 2007, approximately 100 m below the headwaters. Water chemistry samples were collected for ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN), total phosphorus, *Escherichia coli*, *Enterococci*, fecal coliform, and total coliform analyses; see Figure 2. Habitat assessment and benthic macroinvertebrate Stream Condition Index (SCI) sampling were also conducted.

Figure 1: Map of the Manatee Springs Area



Results

The nitrate-nitrite concentration (1.8 mg/L) remained extremely elevated, measuring higher than values found in 95% of typical Florida streams (1.05 mg/L or less). Elevated nitrate-nitrite levels in Manatee Springs Run are related to nitrogen loading in the recharge basin. The ammonia concentration was low, and TKN and total phosphorus concentrations were below method detection limits.

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. In Figure 3, the new thresholds have been retroactively applied to the scores acquired before this date.

The SCI score of 12 for Manatee Springs was in the "impaired" category. The Habitat Assessment score (122) was in the "optimal" range (≥120). Low dissolved oxygen, lack of habitat availability, algal smothering, and elevated conductivity are the likely causes for the low SCI score.

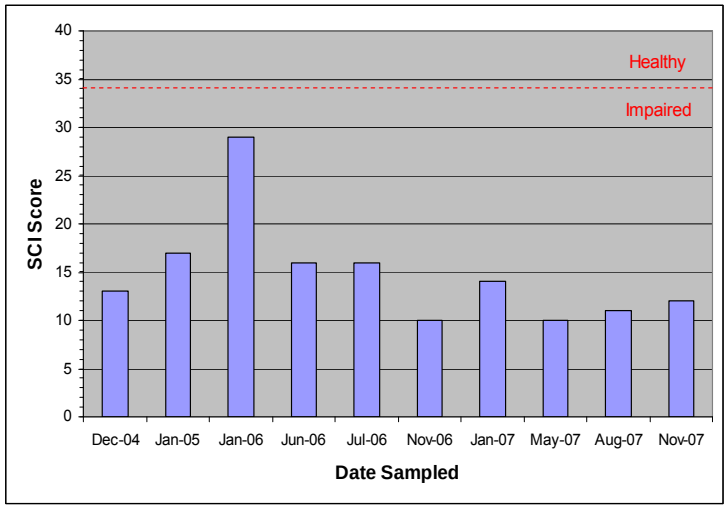
In conclusion, elevated nitrate-nitrite levels and poor macroinvertebrate community health continue to be parameters of concern in Manatee Springs.

Figure 2: Data Table

MANATEE SPRINGS			
Sampling Date	11/1/2007	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	122
SCI Score	12, A	Temperature (deg. C)	22.43
SCI Evaluation	Impaired	pH	6.97
Chemistry Data		Dissolved Oxygen (mg/L)	3.72
Turbidity (NTU)	0.35	Specific Conductance (umhos/cm)	482
Color (PCU)	5 U	**Bacteria Data**	
Ammonia (mg/L)	0.01	*Escherichia coli* (col/100 mL)	2 UQ
Nitrate-Nitrite (mg/L)	1.8	*Enterococci* (col/100 mL)	2 UQ
TKN (mg/L)	0.080 U	Fecal Coliforms (col/100 mL)	2 UQ
Total Phosphorus (mg/L)	0.020 U	Total Coliforms (col/100 mL)	18 BQ

"U"=Below method detection limit; "B"=Results based on colony counts outside the acceptable range; "Q"= Outside of holding time; "A"= Value reported is the mean of two or more determinations

Figure 3: SCI Scores Over Time



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