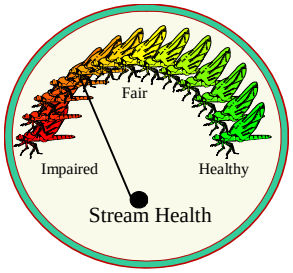
# EcoSummary

Manatee Springs

1/31/2007




## 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 January 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 below the method detection limit, and the total phosphorus and TKN concentrations were below the practical quantitation 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 14 for Manatee Springs was in the "Impaired" category. The Habitat Assessment score of 121 was in the "optimal" range (≥120). The low SCI score may have been due to the lack of habitat availability caused by algal smothering, as well as the low dissolved oxygen concentration and elevated conductivity.

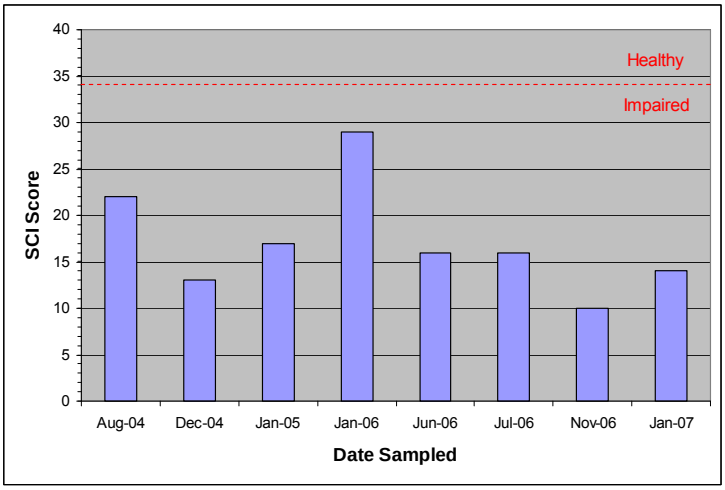
In conclusion, elevated nitrate-nitrite levels and poor macroinvertebrate community health continue to be parameters of concern in Manatee Springs.

**Figure 2: Data Table**

| MANATEE SPRINGS | | | |
|---|---|---|---|
| Sampling Date | 1/31/2007 | **Field Data** | |
| **Macroinvertebrate Data** | | Habitat Assessment Score | 121 |
| SCI Score | 14 A | Temperature (deg. C) | 22.28 |
| SCI Evaluation | Impaired | pH | 6.63 |
| **Chemistry Data** | | Dissolved Oxygen (mg/L) | 0.68 |
| Turbidity (NTU) | 1.3 | Specific Conductance (umhos/cm) | 497 |
| Color (PCU) | 5 | **Bacteria Data** | |
| Ammonia (mg/L) | 0.010 U | *Escherichia coli* (col/100 mL) | 12 BQ |
| Nitrate-Nitrite (mg/L) | 1.8 | *Enterococci* (col/100 mL) | 2 BQ |
| TKN (mg/L) | 0.081 I | Fecal Coliforms (col/100 mL) | 8 BQ |
| Total Phosphorus (mg/L) | 0.024 I | Total Coliforms (col/100 mL) | 10 BQ |

"U"=Below method detection limit; "I"=Below practical quantitation 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**




**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