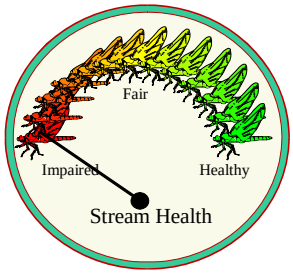
EcoSummary

Fanning Springs

10/23/2007

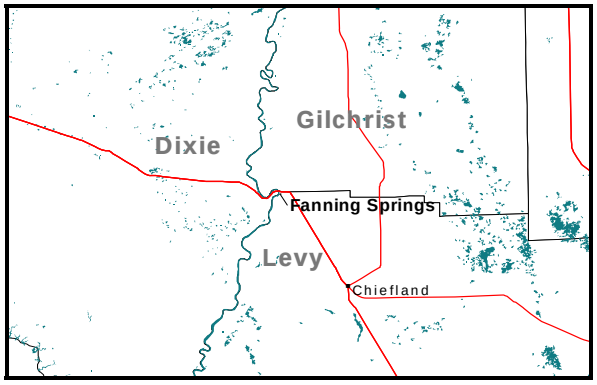


Background

Florida DEP's Division of Recreation and Parks selected Fanning Springs for biological and water quality monitoring. Data from these efforts will be used for making resource protection decisions. Fanning Springs State Park is located in Levy County, Florida; see Figure 1. Fanning Springs, which flows into the Suwannee River, is a Floridan Aquifer-dominated system known for its recreational and aesthetic qualities.

Samples were collected from Fanning Springs on October 23, 2007. Water chemistry samples were taken 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 invertebrate Stream Condition Index (SCI) sampling were also conducted.

Figure 1: Map of the Fanning Springs Area



Results

The nitrate-nitrite concentration at Fanning Spring (5.0 mg/L) continued to be much higher than typical values found in 95% of Florida streams (1.05 mg/L or less). This extremely high concentration of nitrate-nitrite is problematic because it can promote excessive plant growth and stimulate nuisance algal blooms. Elevated nitrate-nitrite levels in Fanning Springs are related to anthropogenic nitrogen loading in the recharge basin.

The TKN and ammonia concentrations were below method detection limits. The total phosphorus concentration was below average compared to typical values found in FL streams. *Enterococci* and *Escherichia coli* concentrations complied with the EPA single-sample guideline values of 61 CFUl/100 mL and 235 CFUl/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.

The SCI score of 14 for Fanning Springs was in the "Impaired" category. The Habitat Assessment score of 116 was in the "suboptimal" range. Habitat smothering and lack of substrate diversity and availability were concerns. The low dissolved oxygen level (2.4 mg/L) was also a cause of stress to the invertebrate community.

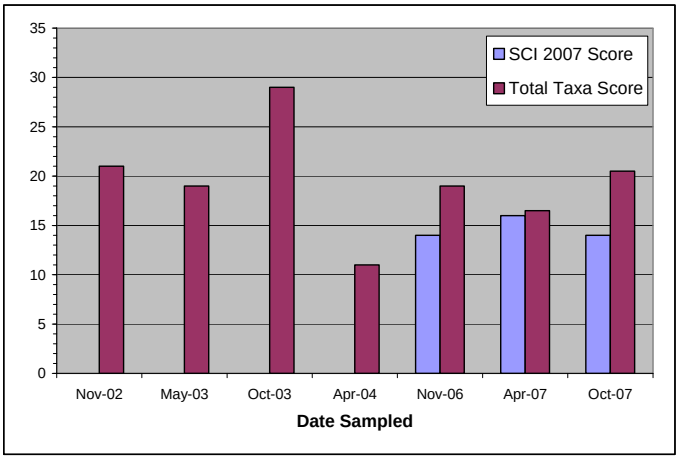
In conclusion, very elevated nitrate-nitrite levels and poor macroinvertebrate community health continue to be issues of concern in Fanning Springs.

Figure 2: Data Table

Fanning Springs			
Sampling Date	10/23/2007	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	106
SCI Score	14 A	Temperature (deg. C)	22.47
SCI Evaluation	Impaired	pH	6.76
Chemistry Data		Dissolved Oxygen (mg/L)	2.4
Turbidity (NTU)	0.20	Specific Conductance (umhos/cm)	496
Color (PCU)	5 U	**Bacteria Data**	
Ammonia (mg/L)	0.010 U	*Escherichia coli* (col/100 mL)	4 BQ
Nitrate-Nitrite (mg/L)	5.0	*Enterococci* (col/100 mL)	22 BQ
TKN (mg/L)	0.080 U	Fecal Coliforms (col/100 mL)	2 BQ
Total Phosphorus (mg/L)	0.067	Total Coliforms (col/100 mL)	28 BQ

"U"= Below Method Detection Limit; "B"= 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: Total Macroinvertebrate Taxa and SCI Scores Over Time



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