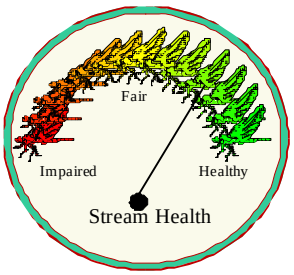


EcoSummary

Ichetucknee Springs

10/16/2007



Background

Florida DEP's Division of Recreation and Parks selected Ichetucknee 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. Ichetucknee Springs State Park is located in Suwannee and Columbia Counties; see Figure 1. Ichetucknee Springs is a Floridan Aquifer-dominated system known for its recreational and aesthetic qualities.

Samples were collected from Ichetucknee Springs on October 16, 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 macroinvertebrate Stream Condition Index (SCI) sampling were conducted. Samples were collected approximately two miles south of the head spring, within the park limits.

Figure 1: Map of the Ichetucknee Springs Area



Results

The nitrate-nitrite concentration in Ichetucknee Springs (0.57 mg/L) was higher than the values found in 80% of Florida streams (0.32 mg/L or less). The total phosphorus concentration was moderately low compared to typical Florida streams. The ammonia concentration was below the Method Detection Limit, and the TKN concentration was below the Practical Quantitation Limit, indicating no potential problems associated with these parameters.

Escherichia coli concentrations complied with the EPA single-sample guideline value of 235 CFU/100mL for "designated beach areas," but *Enterococci* concentrations exceeded the guideline of 61 CFU/ 100mL. The use of *Enterococci* as a human waste indicator may not be appropriate in relatively warm-water systems, such as springs. Other studies, including one by the Bureau of Laboratories, have found that *Enterococci* sources include plant material and soil, and therefore, the *Enterococci* densities in the Ichetucknee may be a natural phenomenon. 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.

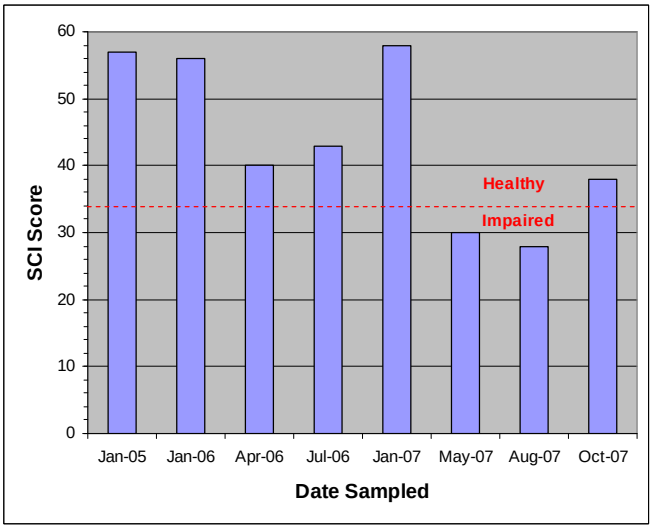
The SCI score of 38 for Ichetucknee Springs was in the "healthy" range, and the Habitat Assessment score (147) was in the "optimal" category. The previous two SCI failures remain unexplained, although physical disruption by recreational tubers is one possibility. In conclusion, the elevated nitrate-nitrite concentration is the main parameter of concern in Ichetucknee Springs.

Figure 2: Data Table

ICHETUCKNEE SPRINGS			
Sampling Date	10/16/2007	**Field Data**	
Macroinvertebrate Data		Habitat Assessment Score	147
SCI Score	38 A	Temperature (deg. C)	21.5
SCI Evaluation	Healthy	pH	7.61
Chemistry Data		Dissolved Oxygen (mg/L)	6.37
Turbidity (NTU)	0.7	Specific Conductance (umhos/cm)	325
Color (PCU)	5	**Bacteria Data**	
Ammonia (mg/L)	0.01 U	*Escherichia coli* (col/100 mL)	56 Q
Nitrate-Nitrite (mg/L)	0.57	*Enterococci* (col/100 mL)	86 Q
TKN (mg/L)	0.095 I	Fecal Coliforms (col/100 mL)	68 Q
Total Phosphorus (mg/L)	0.075	Total Coliforms (col/100 mL)	130 Q

"I"=Below Practical Quantitation Limit; "U"=Below Method Detection Limit; "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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