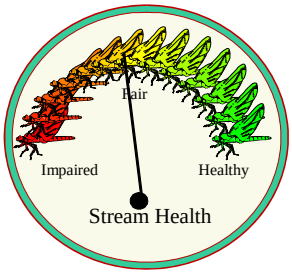


EcoSummary

Juniper Springs

6/8/2006

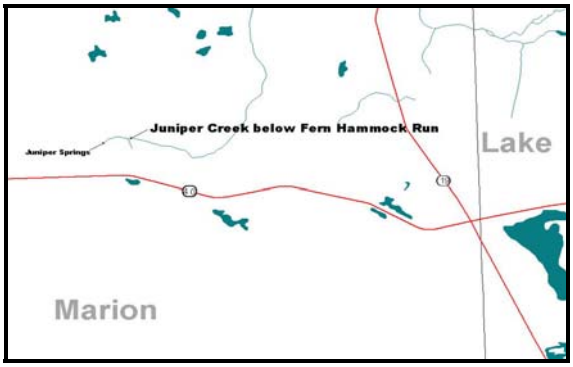


Background

Florida DEP's Division of Water Resource Management selected Juniper Springs for biological and water quality monitoring as part of the Springs Initiative. Data from these efforts will be used for documenting conditions within springs throughout Florida and for making resource protection decisions. Juniper Springs Recreation Area is located in Marion County, Florida, in the Ocala National Forest; see Figure 1. Juniper Creek, which flows from Juniper Springs to Lake George, is a popular canoeing creek known for its aesthetic qualities.

Samples were collected from Juniper Springs in Juniper Creek downstream from the confluence with Fern Hammock Creek in June, 2006. 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 conducted.

Figure 1: Overview Map of the Juniper Springs Area



Results

The nitrate-nitrite concentration (0.062 mg/L) in Juniper Springs was lower than average for Florida streams, and much lower than most Florida springs; see Figure 2. The total phosphorus concentration was below the practical quantitation limit. Ammonia and TKN concentrations were below detection limits. Turbidity and bacteria data were tested outside of holding times.

The overall habitat score (129) was in the "optimal" range. *Enterococci* and *Escherichia coli* concentrations exceeded the EPA single-sample guideline values of 61 CFU/100 mL and 235 CFU/100 mL, respectively, for "designated beach areas." Some species of *Enterococci* are known to be free-living in warm waters; the applicability of the above guideline in Florida waters is currently under investigation. Since the holding times for bacterial analyses were exceeded, and the *E. coli* results were higher than the fecal coliform results (theoretically impossible), this suggests these bacteria results may be unreliable.

The SCI was recalibrated in 2004 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.

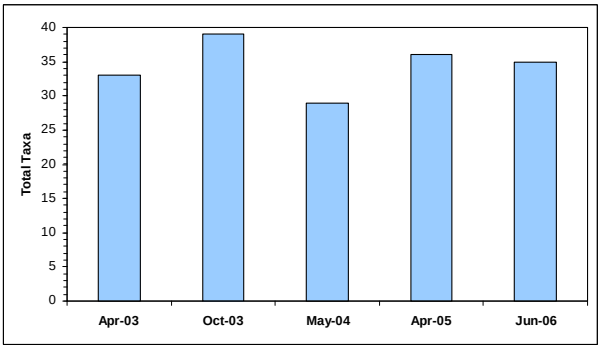
The SCI score of 51 for Juniper Springs was in the "fair" range. In conclusion, biological and water quality parameters indicate that Juniper Springs is ecologically healthy. This system can continue to be used to help define biological and water quality expectations from least disturbed springs in Florida.

Figure 2: Data Table

JUNIPER SPRINGS			
Sampling Date	6/8/2006	**Physical-Chemical Data**	
Macroinvertebrate Data		Habitat Assessment Score	129
SCI Score	51	Temperature (deg. C)	22.6
SCI Evaluation	Fair	pH	7.9
Chemistry Data		Dissolved Oxygen (mg/L)	8.7
Turbidity (NTU)	0.25 A,Q	Specific Conductance (umhos/cm)	124
Color (PCU)	5	**Bacteria Data**	
Ammonia (mg/L)	0.01 U	*Escherichia coli* (col/100 mL)	380 Q
Nitrate-Nitrite (mg/L)	0.062	*Enterococci* (col/100 mL)	300 Q
TKN (mg/L)	0.08 U	Fecal Coliforms (col/100 mL)	188 Q
Total Phosphorus (mg/L)	0.021 I	Total Coliforms (col/100 mL)	660 Q

"U"=Below detection limit; "I"=Below practical quantitation limit; "Q"=Outside of holding time, "A" - Mean of Two or More Determinations.

Figure 3: Total Number of Macroinvertebrate Taxa Over Time



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