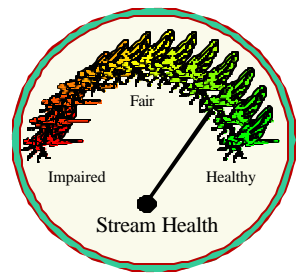




EcoSummary

Swift Creek at Methodist Church Road

03/14/00



Background

Florida DEP's Division of Resource Assessment and Management sampled Swift Creek for biological and water quality monitoring as part of a Fifth Year Inspection of the PCS Phosphate Chemical Complex and Mines. Swift Creek is located in Hamilton County in the Northeastern part of Florida; see Figure 1. Swift Creek is in the Southern Coastal Plains Ecoregion, in the Okefenokee Swamps and Plains Subregion, and the Southeastern Plains Ecoregion, in the Tifton Uplands/Tallahassee Hills Subregion. Sampling was done in order to determine any effects of wastewater discharge on the receiving water body, Swift Creek.

Water chemistry samples were taken for metals, ammonia, nitrate-nitrite, organic nitrogen, total Kjeldahl nitrogen (TKN), total nitrogen, ortho-phosphates, total phosphorus, fecal coliform, and total coliform analysis; see Figure 2. Habitat assessment, qualitative periphyton, phytoplankton, and benthic invertebrate stream condition index (SCI) sampling were conducted as well.

Results

The nitrate-nitrite (NO_x) (0.54 mg/L) and total Kjeldahl nitrogen (TKN) (1.70 mg/L) concentrations were higher than values found in 80% of Florida streams (0.32 mg/L and 1.49 mg/L, respectively); see Figure 2. The ammonia concentration (0.55 mg/L) was quite elevated, measured to be higher than the values found in 90% of Florida streams. Furthermore, the ortho-phosphate (1.8 mg/L) and total phosphorus (2.0 mg/L) concentrations were higher than that found in 95% of Florida streams (1.37 and 1.51 mg/L, respectively). The overall habitat assessment score of 133 was in the optimal range. However, substrate availability, water velocity, habitat smothering, artificial channelization, and bank stability all scored in the suboptimal category. Fecal coliform (87 CFU/100mL) and total coliform (1800 CFU/100mL) levels complied with the Class III water quality standards of 800 and 2400 CFU/100mL, respectively. The stream condition index (SCI) score of 25 for Swift Creek was in the good range. The Algal Growth Potential (AGP) (45.5 mg dry wt/L) greatly exceeded the 5 mg dry wt/L "problem threshold" for fresh water systems and implies nutrient enrichment.

In conclusion, the water in Swift Creek (sampled at Methodist Church Road) had elevated levels of nitrite-nitrate (0.54 mg/L), ammonia (0.55 mg/L), TKN (1.70mg/L), ortho-phosphate (1.8 mg/L), and total phosphorus (2.0 mg/L). Potentially due to other mitigating factors (light penetration,

water retention time), the invertebrate community was not affected by the nutrient enrichment, as the site scored a "good" on the SCI. The periphyton population was indicative of eutrophic conditions, with four of the five dominant taxa known to thrive in nutrient enriched waters.

Figure 1: Overview Map of the Swift Creek Area

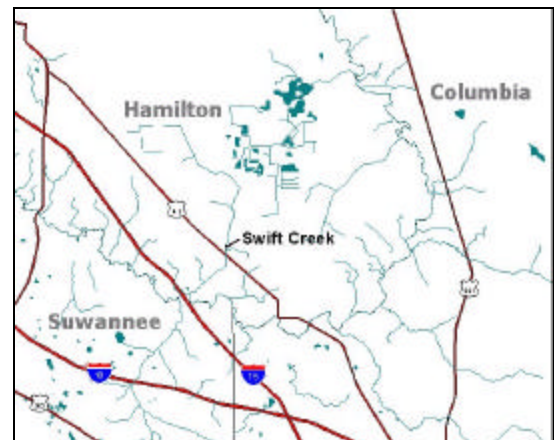


Figure 2: Data Table

Swift Creek at Methodist Church Road			
Station		Swift Creek	
Station Nick Name		SWIFT@MCRD	
STORET		21010055	
Sampling Date		3/14/00	
Macroinvertebrate Parameters		Chemistry Data	
SCI	25	Ortho-phosphates (mg P/L)	1.8
SCI Evaluation	Good	Total Phosphorus (mg/L)	2.0
SCI Region	Northeast	Ammonia (mg/L)	0.55
Number of Taxa	26	Nitrate-Nitrite (mg/L)	0.54
Number of Ephemeroptera	0	TKN (mg/L)	1.7
Number of Plecoptera	0	Organic Nitrogen (mg/L)	1.15
Number of Trichoptera	1	Total Nitrogen (mg/L)	2.24
EPT Index	1	Fluoride (mg/L)	2.6
% Dominant Taxon	13.3	Physical Chemical	
Florida Index	10	Habitat Assessment	133
% Diptera	58.9	Sample Depth (ft)	1.0
Number of Chironomidae	2	Specific Conductivity (umhos/cm)	530
Number of Orthocladinae	7	Dissolved Oxygen (mg/L)	4.2
Total Number Chironomidae	10	pH (SU)	7.09
% Filter-Feeders	9.2	TSS (mg/L)	2.0
Phytoplankton Parameters		Temperature (deg C)	18.1
Number of Taxa	20	Gross Alpha (pCi/l)	2.0
Algal Density (#/mL)	76,001	Hardness (mg CaCO ₃)	200.73
% Bacillariophyceae	9.1	AGP (mg dry wt/L)	45.5
% Chlorophyceae	41.8	Metals (ug/L)	
% Cyanophyceae	48.5	Aluminum	130 I
Periphyton Parameters		Arsenic	4.0 U
Number of Taxa	24	Cadmium	0.04 U
Chlorophyll a (mg/m ²)	3.4	Chromium	0.79 I
Algal Density (#/cm ²)	206,140	Copper	1.21
% Bacillariophyceae	46.97	Iron	63 A
% Chlorophyceae	9.09	Lead	0.25 U
% Cyanophyceae	43.9	Nickel	2.81
Bacteria Parameters		Selenium	1.2 U
Fecal Coliforms (col/100mL)	87	Silver	0.03 U
Total Coliforms (col/100mL)	1800 J	Zinc	10.0 U

"J"- Estimated Value; "I"- Below Quantitation Limit; "A"- Average; "K"- Actual value known to be less than value given; "U"-Not Detected; value is MDL



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