



EcoSummary

Little Creek
January 19, 2000



BioRecon: A rapid, cost-effective screening mechanism for identification of biological impairment.

Purpose

BioRecon utilizes macroinvertebrate community structure as a screening tool to determine water quality in small freshwater streams. Thresholds are assigned to three measurements; total taxa, Florida Index (pollution sensitive organisms) and EPT which is the number of ephemeroptera, trichoptera and plecoptera (pollution sensitive organisms) present in a sample. If the site passes all three parameters, it is considered "healthy". If two measurements pass, it is considered "suspect". If zero to one measurement pass, it is considered "impaired".

Background

A BioRecon was performed at Little Creek at US 441 in Columbia Co., to provide data for the calibration of the BioRecon with the more intensive Stream Condition Index (SCI). Little Creek is one of Northeast District's reference streams. It is a first order tributary to the Suwannee River. The last assessment performed (SCI) at this site in 1996 rated 'excellent' with a score of 29 out of 31. The predominant land use in this area is silviculture. The moderate sand deposition observed in half of the 100 meter stretch was most likely due to local upstream bridge construction on US 441. Recent drought conditions caused the water level to be low and velocity to be slower than normal. The riparian vegetation was a good mixture of palmetto, grasses, oak and pine trees creating about 45% canopy cover. This assessment looked at three major stream characteristics: macroinvertebrate community structure, habitat quality, and physiochemical field measurements. Macroinvertebrates were collected using a D-frame dipnet to sweep through common substrate types. The sample was stored on ice and returned to the lab for sorting. Habitat characteristics such as riparian zone vegetation quality, bank stability, substrate availability and water velocity were assessed visually. A Hydrolab multiprobe data logger was used to determine physiochemical parameters in situ, according to DEP SOP.

Results

Little Creek passed all three biological measurements indicating a healthy aquatic ecosystem: thresholds in parentheses 18(>17) in Taxa Richness, 10(>6) in the Florida Index, and 6(>3) on the EPT. Chironomids dominated the sample and damselflies, mayflies and caddisflies were also common.

This community diversity reflects the presence of healthy and stable habitats within the creek. The habitat assessment ranked 134 out of 160, in the 'optimal' range. Leaf packs and mats represented the greatest percentage of habitat types. Low water level and velocity contributed to the presence of some anaerobic leaves. Sand smothering was evident, up to 0.6 meters deep in some places. Riparian vegetation was consistent with expected communities. No bank erosion was observed. Total and fecal coliform counts were 3830 cfu/100ml and 2700 cfu/100ml, respectively, violating Class III Surface Water Quality Standard for freshwater (62-302 F.A.C.). A rain event on the day prior to sampling may have caused the high coliform levels. Dissolved oxygen (6.6 mg/L) and pH (6.8 SU) were both consistent with past readings.

Significance

In general, Little Creek is showing similar characteristics as in past assessments and remains a reference site for the Northeast District. Past surveys have shown higher water levels and lower coliform counts. However, the macroinvertebrate community structure appears unchanged. The recent bridge construction near the sample site is an obvious source of sand smothering but not for an extensive distance. I expect that the creek will recover from both the drought effects and bridge construction, and that coliform counts will decrease with time.

Suggestions

Little Creek continues to serve as a reference site for the Northeast district. Coliform levels should be monitored in order to identify possible long term problems. Best management practices should continue to be used in surrounding lands. Measures should be taken to prevent further sand smothering caused by local bridge construction.

For more information, please contact:
Bonnie Niedbalski
DEP Northeast District 7825 Baymeadows Way, Suite B200
Jacksonville, FL 32256
(904) 807-3300
email: niedbalski_b@dep.state.fl.us

Published by the Florida Department of Environmental Protection,
Tallahassee, FL.
For more information on the DEP Bioassessments program, please
visit our website at <http://www2.dep.state.fl.us/water/Slerp/bio/>