



EcoSummary

Rattlesnake Slough, Hillsborough County.
Manatee River Watershed
August 19, 1998



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

Purpose

Macroinvertebrate samples were collected for a biorecon, short for bioreconnaissance, of Rattlesnake Slough in order to gain further information on the biological health of the watershed for use in the administration of Florida's Ecosystem Management Water Quality Assessment (EMWQAS) and Total Maximum Daily Loads programs. A field biorecon, a rapid screening method for identification of biological impairment, was also performed. Surface water samples were collected for analysis of parameters of concern. All work conducted by EMWQAS was conducted according to established DEP standard operating procedures and quality assurance plans. Biorecons are based on three measurements of the aquatic invertebrates present in the stream: the total number of different species (Total Taxa), the number of "good water quality" indicator species (Florida Index) and the total number of Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) species present. A stream scoring above the threshold value for all three of these measurements is considered healthy. If two of the threshold values are reached, the stream's health is considered ecologically suspect. If only one or none of the thresholds are reached, an impaired condition is concluded.

Background

Rattlesnake Slough is located in southwestern Manatee County, southeast of Bradenton. It is a first order stream that flows into the Braden River upstream of Evers Reservoir (Ward Lake). Evers Reservoir serves as a potable water supply for the City of Bradenton. Landuse in the basin is a mixture of residential development and agriculture. Water quality samples collect by the Manatee Environmental Action Commission (EAC) between 1989 and 1992 indicated moderately high levels of total phosphorus (TP) and natural levels of total nitrogen (TN). Annual averages of coliform bacteria ranged from 800 to 1350 colonies/100 m, exceeding the monthly average State standard in 50% of the samples. Annual averages for fecal coliforms ranged from 92 to 402 colonies/100 ml, exceeding the monthly average State standard in 40% of the samples. The Manatee County EAC attributed the high levels to cattle ranges, which was the predominant land use in the watershed at that time. They also suggested that naturally occurring plant and soil bacteria, such as Klebsiella, are common interferers in coliform methodology, and may result in excessive levels of coliforms that are not attributable to fecal matter.

Results

The sampling site was located at the second crossing of Lindon Road. There has been much recent development in the watershed, and Rattlesnake Slough now appears to be serving as a drainage ditch. Water velocity was negligible. Riparian zone was virtually nonexistent, and the banks were very unstable. Land clearing adjacent to the stream had no sediment or erosion control devices in place. There were deep areas of anaerobic organic sediment. Further downstream it was observed that newly installed residential stormwater ponds discharge into Rattlesnake Slough. The habitat score was 71 out of 160, in the marginal category. In-stream substrates were neither plentiful or diverse. More than 80% of the available habitat was smothered by silt. Dissolved oxygen was below the State standard of 5.0 mg/l (Rule 62 - 302 FAC), at 3.36 mg/100 ml. The TN concentration was 0.81 mg/l, which is relatively low as compared to typical values for Florida streams, but ammonia was slightly elevated (0.071 mg/l). The TP measurement was moderately high at 0.5 mg/l, but TP values tend to be higher in south-central Florida than in streams from other areas of the state, because of the naturally occurring phosphatic deposits here. Fecal coliforms were 1360 colonies/100 ml, exceeding the single sample standard (Rule 62 - 302 FAC), while total coliforms were at moderate levels (800 colonies/100 ml). Rattlesnake Slough did not meet the biorecon thresholds for EPT and Florida Index, indicating impairment of Class III designated use. This is likely due to a combination of habitat degradation and water quality.

Significance

The excessive levels of total and fecal coliforms suggest the contamination found in the 1980s is still a problem today. Cattle ranging is still a predominant industry in the watershed. These levels present a potential health hazard. The results of the macroinvertebrate assessments indicate ecological degradation and failure to meet designated use for Class III surface water bodies. Impairment to the aquatic macroinvertebrate community can result in reductions of fish and bird populations in the Braden and Manatee River watersheds.

Suggestions

An investigation in the watershed of Rattlesnake Slough should be conducted in order to determine the pathogenic content of the coliforms, after which the appropriate steps can be taken to end the contamination and restore the creek to ambient coliform levels. Physical restoration will be necessary in order to reestablish aquatic habitat, stabilize banks and provide a buffer against runoff.

For more information, please contact:

Peggy Morgan

DEP Southwest District 3804 Coconut Palm Drive Tampa, Florida
33619

(813) 744-6100

email: morgan_p@tpa1.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/>