



EcoSummary

Muddy Branch at County Road 167, Jackson County

May 19, 1999 - August 3, 1999



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

Introduction

Muddy Branch at SR167, a tributary of the Chipola River, is located in Jackson County. This area is located in subregion 65g (Dougherty/Marianna Plains) with land use mostly agriculture and pasture lands, with some residential use. Sedimentation is a major concern in this area. Sewage discharged by the Northwest Florida State Hospital and the Marianna Municipal Airport may impact Muddy Branch. This site is one of 18 locations in Northwest Florida selected for the establishment of an USGS gaging station. Stage flow and discharge flow data will be analyzed by USGS in conjunction with the collection of water quality samples by FDEP, as part of the Surface Water Temporal Variability (SWTV)/TMDL project. The Water Quality Assessment Section (WQAS) of FDEP-Tallahassee assists in these efforts. All data will be used by FDEP and EPA to develop Total Maximum Daily Loads (TMDLs) for these waterbodies. The purpose of a TMDL is to determine the amount of pollution reduction needed to restore the system to a condition suitable for its designated use. In this case, the designated use is for recreation and maintenance of a healthy, well-balanced aquatic community. DEP's Water Quality Assessment Section is charged with assessing the status of selected waterbodies on the 1998 303(d) TMDL list that were placed on the list with limited data. The data available for these selected waterbodies consisted of less than 10 observations in the STORET database, historical STORET data, or qualitative non-point source survey data only. Muddy Branch was originally put on the list because of concerns about dissolved oxygen, coliform bacteria, and excessive nutrients. Recent water quality data suggests that the Muddy Branch watershed is not meeting standards for Class III waterbodies, including criteria for dissolved oxygen, coliform bacteria, and excessive nutrients. According to the 1998 305(b) report, it is poorly meeting its designated use.

Results and Discussion

Physical/chemical parameters and nutrients were sampled in August of 1999. Surface water samples were collected and analyzed for total ammonia, nitrite-nitrate, total Kjeldahl nitrogen (TKN), and total phosphorus. Samples were also analyzed for total suspended solids (TSS), turbidity, fecal and total coliform bacteria levels plus other chemical parameters. Aquatic macroinvertebrate communities were not sampled at this time. However, a FDEP macroinvertebrate BioRecon survey conducted in September 1998 revealed very poor water quality. Dissolved oxygen levels were depressed. Bacteria coliform, total phosphorus, and ammonia levels were extremely high. Severe impairment was suspected since Muddy Branch failed all three BioRecon metrics. Most measured physical/chemical parameters and water quality variables did not meet acceptable criteria for Class III waterbodies. Dissolved oxygen was 2.1 mg/l, well below the 5.0 mg/l Class III waterbody criterion. Fecal coliform (6600 colonies/ml) and total coliform (14,000 colonies/ml) were extremely elevated beyond the Class III standards of 800 colonies/ml and 2400 colonies/ml, respectively. Nitrite-nitrate (0.47 mg/l) and total phosphorus (0.23 mg/l) levels were elevated, exceeding the levels found in 85% and 65% of other Florida

streams, respectively. Concurrent hydrolab and chemistry samplings revealed similar data results in Muddy Branch downstream within the Florida Caverns State Park. The dissolved oxygen concentration reading was 3.72 mg/l, below the State criterion of 5.0 mg/l. Adequate dissolved oxygen is necessary to maintain a healthy, well-balanced aquatic system.

Conclusions

Muddy Branch at SR167 did not meet acceptable levels for most of the measured physical/chemical and water quality parameters, including dissolved oxygen, coliform bacteria, and excessive nutrients. According to the September 1998 Muddy Branch Ecosummary, it failed all three BioRecon metrics and severe ecological impairment was suspected. It is recommended that Muddy Branch remain on the 303(d) list and monitored periodically for water quality.

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Published by the Florida Department of Environmental Protection,
Tallahassee, FL.
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