

Moore Creek CR 197 in Santa Rosa County July 16, 1998

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

Introduction

Moore Creek is located in Santa Rosa County and drains the agricultural lands southwest of Jay. This tributary to the Escambia River flows to Pensacola Bay via Escambia Bay. Its subcoregion 65F watershed drains predominantly agriculture and pasture in the upper reaches. Dirt roads, road/highways, low density residential, and crop spraying airports were other land use within the drainage.

Coliform bacteria, nutrients, and turbidity were nonpoint pollution concerns, which placed Moore Creek on the 303(d) list for TMDL study. The purpose of the TMDL is to determine the amount of pollution reduction needed to restore the system to a condition suitable for its designated use. Moore Creek is designated Class III waters for recreation and maintenance of a healthy, well-balanced aquatic community



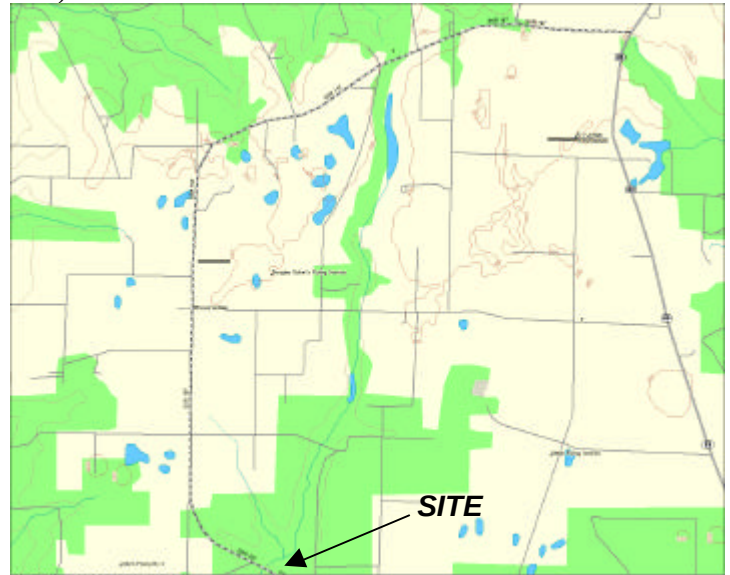
Moore Creek CR 197 – note sediment filled stream channel and resultant lack of capacity to accommodate floodwaters

Results and Discussion

Macroinvertebrate communities were sampled on 07/16/98 from in-stream habitats by the FDEP BioRecon method above State Road 197(STORET 33020100). Three metrics, consisting of total taxa richness, the Florida Index, and total EPT taxa were calculated and compared to existing thresholds to determine the community's health. Moore Creek failed to meet one of 3 biometric thresholds indicating a suspect condition at the site. A recent (02/01/99) BioRecon about 2 miles upstream at C-164 indicated impairment after failing all 3 biometric thresholds. Total and fecal coliform bacteria counts (480 and 70 colonies/100ml) were within the water quality standard (2,400 colonies & 800 /100ml) during this non-runoff period. Turbidity was low due to lack of rain however, the water turned muddy after disturbing substrates. Observations of Moore Creek after thundershowers found it turned to an opaque brown color from agriculture row crop runoff. Nitrite-nitrate concentrations were substantially elevated (2 mg/l) exceeding nitrate levels found in 90% of other Florida streams. The water had a musty blue green algae odor

with some of growth of periphyton and iron/sulfur bacteria. The sediments had a musty odor with much iron/sulfur bacteria growth. This area experienced a record drought during the May/June period with hot temperatures and scattered showers for July.

The habitat assessment of the site was 50% of the % similarity to the reference score. A score of 65% is an interim biometric threshold. Substrate availability was marginal low and habitat smothering rated poor from 92% coverage of habitats with 90% sand 2% mud/muck/silt. The available substrates were covered with a layer of silt. The stream banks were moderately unstable with areas of erosion. The stream was channelized from sedimentation filling its bed. Some bridges over Moore Creek had very little freeboard over (~ 1 foot) the stream surface because the channel was fill with sediment. These bridges are typically flooded or destroyed by significant rain events. The riparian zone was young and dominated by pioneer species of plants (i.e. hazel alder).



Conclusions

Moore Creek failed one of three BioRecon metrics, indicating suspect condition at this site. Physical/chemical parameters such as habitat smothering and nutrient enrichment are from anthropogenic disturbances. Sources of these problems are mainly agriculture but include silviculture and dirt roads. Coliform bacteria sources include agriculture with livestock a major source of coliform bacteria. The presence of coliform bacteria and turbidity were rainfall dependent. Since a site ~ 2 miles upstream of this sample location indicated impairment, it is recommended that Moore Creek remain on the 303(d) list.

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