

## Bruce Creek CR81 in Walton July 28, 1998

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

### Introduction

Bruce Creek is located in eastern Walton County with its headwaters in the southern areas of DeFuniak Springs. This subcoregion 65F stream flows to Choctawhatchee Bay via the Choctawhatchee River. The watershed land use includes agriculture, silviculture, range, mining, commercial, residential, industrial, impoundment, utility transmission line, dirt road, and highway areas.

Coliform bacteria and turbidity were nonpoint pollution concerns, which placed Bruce 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. Bruce Creek is designated Class III waters for recreation and maintenance of a healthy, well-balanced aquatic community.



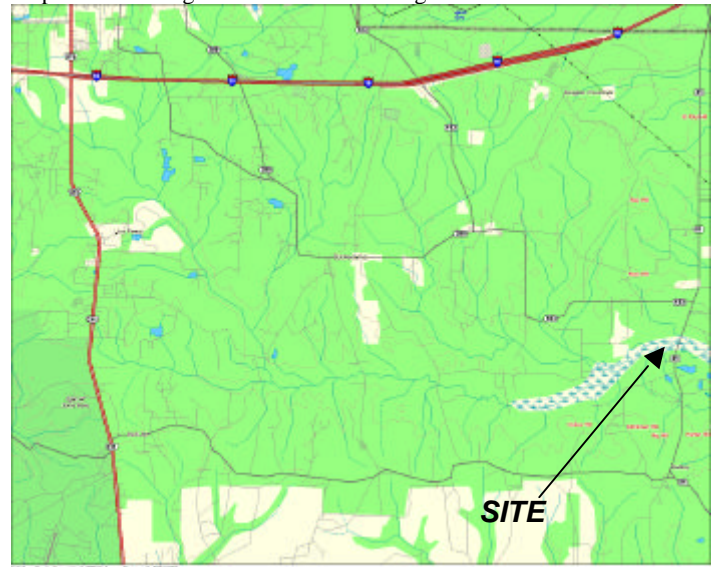
### Results and Discussion

Macroinvertebrate communities were sampled on 07/28/98 from in-stream habitats by the FDEP BioRecon method above SR 81. 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. Bruce Creek passed 2 of 3 biometric thresholds indicating a suspect condition at the site. Stoneflies, a clean water indicator and major component of 65f subcoregion stream communities were conspicuously absent.

The biochemical oxygen demand was 1.4 mg/l was elevated for a 65f-subcoregion stream (normally less than 0.36 mg/l). Total and fecal coliform bacteria counts (560 and 100 colonies/100ml) were within the water quality standard (2,400 colonies & 800 /100ml) during this non-runoff period. The turbidity (7 NTU) exceeded the values of 50-60% of other Florida streams and the water turned very muddy after disturbing substrates. The suspended solids (8 mg/l) exceeded the levels of 50-60% of other Florida streams. The water had a musty blue-green algae odor. The sediments had an anaerobic and ammonia odor (water ammonia (0.029 mg/l). 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 67% of the % similarity to the reference score. A score of 65% is an interim biometric threshold. Habitat smothering rated marginal from 75% coverage of habitats with 20% sand, 1% and 55% mud/muck/silt. The substrate diversity rated marginal with only 2 productive habitats available. The substrates were covered with a thick layer of mud. The stream banks were moderately unstable with areas of erosion and high erosion potential during floods.

Wastewater and sludge from a poultry-processing plant is land applied in the watershed. Two tributaries had bioassessments performed during 1996. Panther Creek SR 280 (STORET # 32020098 had a healthy macro-invertebrate condition with a borderline habitat conditions attributed to erosion and siltation from agricultural lands. Bay Branch US 331(STORET # 32020097) had an impaired health with a borderline habitat attributed a severely depressed dissolved oxygen (0.1 mg/l) from urban and agricultural runoff settling in the deep channel dredged for a culvert crossing at US 331.



### Conclusions

Bruce Creek passed 2 of 3 BioRecon metrics, indicating a suspect condition at this site. Habitat smothering was observed an anthropogenic disturbance. Turbidity sources include agriculture, silviculture, urban construction and dirt road runoff. Coliform bacteria sources include runoff from chicken growers, wastewater sludge land application, and other livestock. The presence of coliform bacteria and turbidity were rainfall dependent. This sample was collected after a record drought so turbidity and bacterial concerns were not adequately monitored for this watershed. It is recommended that Bruce Creek be monitored during and after significant rainfall events. This would determine turbidity and bacterial effects on recreational activities and shellfish harvesting in Choctawhatchee Bay's Class II waters. **For more information, contact Donald Ray, FDEP Northwest District, 160 Governmental Center, Pensacola, FL 32501 (850) 595-8300 x1126 or SC 695-8300**