

## Lafayette Creek Hwy 20 in Walton County

August 17, 1998

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

### Introduction

Lafayette Creek is located near Freeport in south Walton County with its headwaters draining a large commercial farm. This subcoregion 75A stream flows into the Choctawhatchee Bay via LaGrange Bayou. Watershed land use includes agriculture, silviculture, residential, commercial, dirt roads, and highways.

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



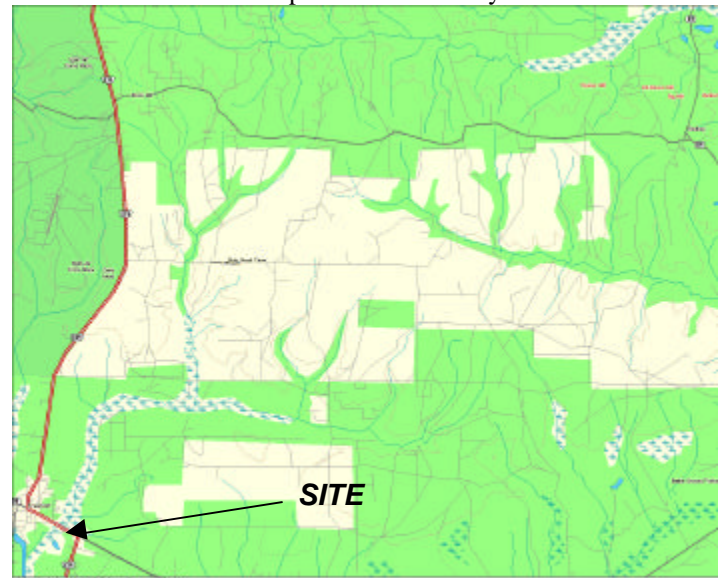
Lafayette Creek below Hwy 20 was formerly a narrow, clear, fast flowing stream when last monitored in the early 1980's.

### Results and Discussion

Macroinvertebrate communities were sampled on 08/17/98 from in-stream habitats by the FDEP BioRecon method below Highway 20 (32010002) in Freeport. This site was a secondary monitoring in the Federal Water Quality program from the 1970's to the 1980's. The reach below the road had been channelized and dredged since that time. 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. Lafayette Creek failed to meet all 3 biometric thresholds, which indicated impairment at the site. Historical biological monitoring found the following:

Date	Total Taxa	Florida Index	EPT
02/22/78	53	42	27
10/11/78	41	34	22
03/11/81	31	32	21
08/17/98	20	7	7
<b>Thresholds</b>	24	22	17

Total coliform bacteria counts of 4900 colonies/100 ml failed the water quality standard (2,400-colonies/100 ml). Fecal coliform bacteria counts were elevated (600 colonies/100 ml), but within the water quality standard (800 colonies /100 ml). The biochemical oxygen demand of 1.4 mg/l was elevated for this type of stream (normally less than 0.36 mg/l). Historically, high nitrate concentrations were found in Lafayette Creek from a corporate fertilizer application/injection. The US Geological Survey water monitoring in 1995 found nitrate concentrations of 4.2 mg/l in a tributary (Magnolia Creek), which drained First American Farms. FDER water monitoring at Lafayette Creek at Highway 20 during the 1970-80's found elevated nitrate concentrations (1.8 - 2.23). A surface sheen was present from the iron/sulfur bacteria. The sediments had a hydrogen sulfide odor. The habitat assessment of the site was 63% of the % similarity to the reference score. A score of 65% is an interim biometric threshold. Habitat smothering rated poor from 82% coverage of habitats with mud/muck/silt. Artificial channelization with >80% of the area affected rated marginal. The channel width was much wider now compared with the early 1980's.



### Conclusions

Lafayette Creek failed all three BioRecon metrics, indicating impairment at this site. Physical/chemical parameters, biological and water quality variables such as biochemical oxygen demand, habitat smothering, artificial channelization, and nutrient enrichment, indicated anthropogenic sources. Sources of these problems include agriculture, silviculture, and dirt roads. It is recommended that Lafayette Creek remain on the 303(d) list. For more information, contact Donald Ray, FDEP Northwest District, 160 Governmental Center, Pensacola, FL 32501 (850) 595-8300 x1126 or SC 695-8300