

Mare Branch below Pineview Church Road Santa Rosa County

February 17, 1999

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

Purpose

A BioRecon was performed at this site to monitor potential nonpoint source impacts in the Pensacola Bay system for a 319 Agriculture Outreach Program grant. This bioassessment was used to determine the health of Mare Branch's biota and habitats. The site was chosen by the use of geographic information systems to identify areas of agricultural land use.

Background

Mare Branch at the bioassessment site (Lat. 30° 49' 01.4" Long 87° 06' 56") is a second order stream draining agricultural lands southeast of the town of Jay. It is a tributary to West Fork Big Coldwater Creek and the Blackwater River, which is classified as Outstanding Waters under the Florida Water Quality Standards. The Blackwater River flows into Pensacola Bay via Blackwater and East Bays. The Yellow River Marsh along Blackwater Bay is a State Aquatic Preserve. Mare Branch drains the southern pine plains and hills of subecoregion 65F.



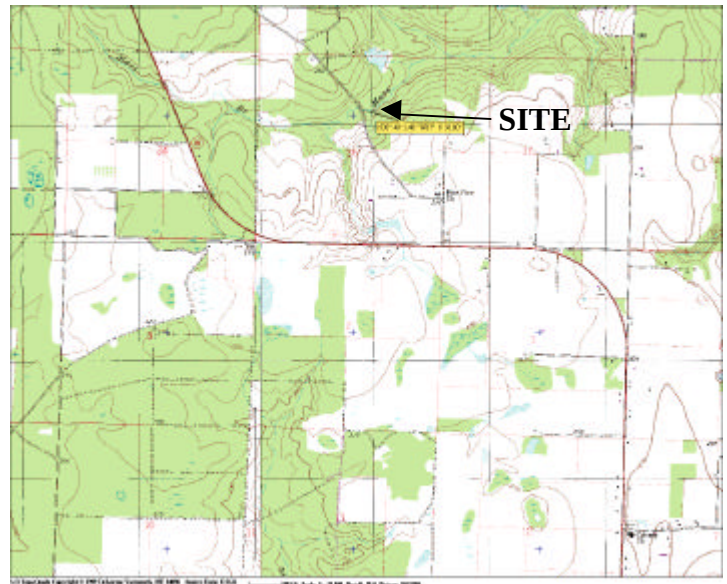
Results

The BioRecon indicated impairment of Mare Branch's biological community. All 3 biological indicators failed to meet thresholds established for a healthy aquatic ecosystem:

Biometrics	Value	Threshold
Taxa Richness	13	≥ 24
Florida Index	10	≥ 22
EPT	1	≥ 17

This severely imbalanced aquatic community was dominated by a bacteria-feeding blackfly and sediment tolerant midge (*Rheotanytarsus*). Midges (chironomidae) and planarians were abundant in the nutrient enriched stream. The site's habitat assessment score of 56% (89 out of 160 points) rated in the suboptimal range. Mare Branch's headwater's drained cotton row crop and pasture. Much of its former riparian areas and wetlands had been developed into agricultural use. The stream channel was heavily braided by historical watershed erosion from agricultural practices. The stream substrates were 90% smothered with silt. An abundant concentration of iron/sulfur bacteria colored the bottom orange and left a surface sheen. The nitrate-nitrite concentration was elevated (0.98 mg/l) above background concentrations (0.03 mg/l) at Manning Creek below Whittfield Road). An imbalanced aquatic floral community of thick algal mats resulted from the nutrient enrichment. Household garbage, tires, and numerous animal

carcasses in fertilizer bags were dumped at the bridge. The exotic invasive shrub, Chinese privet (*Ligustrum*) was abundant in the disturbed riparian zone.



Significance

The results confirm this stream is degraded by human activities. This Mare Branch site does not meet Class III State Water Quality Standards 62-302 for recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The bacteria bloom that fed blackfly pests had created nuisance conditions along Mare Branch in violation of Florida Surface Water Quality Standard 62-302.530(47) (Nuisance Species). Blackfly adults have been implicated in transmission of diseases to livestock including bovine onchocerciasis, *Leucoytozon smithi*, a disease in domestic turkeys, and a transmitter of a disease that kills poultry. The elevated concentrations of nitrate-nitrate are a concern for Surface Water Quality Standard 62-302.530(48a) and (48b). Rule (48a) states "Man-induced nutrient enrichment (total nitrogen or total phosphorus) shall be considered degradation in relation to the provisions of Sections 62-302.300, 62-302.700, and 62-4.242, F.A.C." Rule (48b) "states, "In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna". Headwater streams like Mare Branch are a major food and habitat source for the downstream river and estuarine fish and wildlife. Impairment to these headwater tributaries limits downstream productivity of fish and wildlife. Sediment runoff from the agricultural lands had filled Mare Branch wetland and stream habitats. This runoff contributes to downstream turbidity and the filling of river and bay habitats.

Suggestions

Implementation of best management practices for agriculture is needed. Agricultural management practices that restore native riparian and transitional zone forests are required to protect water quality and enhance fish and wildlife diversity and productivity. **For more information, contact Donald Ray, FDEP Northwest District, 160 Governmental Center, Pensacola, FL 32501 (850) 595-8300 x1126 or SC 695-8300**