A site map can be viewed by clicking on the report site name.

EcoSummary

East Fork Magnolia Creek above culvert on Owls Head Farm

February 20, 2003

IMPAIRED

FLORIDA AMBIENT

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

For samples collected before June 8, 2004
All field and laboratory methods followed FDEP Standard Operating Procedures and met FDEP quality assurance/quality control standards.
For samples collected on or after June 8, 2004
All field and laboratory methods followed FDEP Standard Operating Procedures (SOPs) and met DEP quality assurance/quality control standards.

Introduction

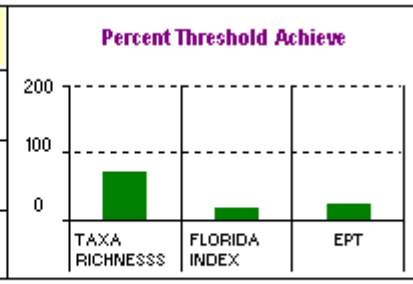


This biological assessment was conducted in support of a request by the United States Fish and Wildlife Service (USFWS) for their Ecosystem Restoration Project in East Fork Magnolia Branch. Road fill and an improperly placed culvert impounded this stream reach of East Fork Magnolia Creek. Sediment runoff from dirt roads and bare soils along the slope above the stream, as well as hydrological modification from the dam, affected the watershed's health. The USFWS has initiated a restoration project in East Fork Magnolia Creek that will include restoring the sinuous stream channel and re-planting denuded slopes. This BioRecon documents the pre-restoration benthic invertebrate community's condition in this anthropogenically-impounded reach of East Fork Magnolia Creek. The sample reach (Latitude 30 degrees 34 minutes 5 seconds North, Longitude 86 degrees 4 minutes 47.6 seconds West) is located about 2.5 miles northeast of Freeport. This East Fork Magnolia Creek site (STORET # 32010032) is at least a second order stream draining the Gulf Coast Flatwoods of subecoregion 75A near the border with Southern Pine Plains and Hills subecoregion 65F. East Fork Magnolia Creek is a tributary to Lafayette Creek and flows into Choctawhatchee Bay via LaGrange Bayou.

Results and Discussion

This East Fork Magnolia Creek site failed all the three biometrics to indicate an impaired condition.

Biometrics	Value	Threshold
TAXA RICHNESS	17	>= 24
FLORIDA INDEX	4	>= 22
EPT	4	>= 17



Values and Percent Threshold Attained for Panhandle West BioRecon Metrics

The stream's benthic community structure was severely altered by the dam. Stoneflies, the best measures of stream health, were absent. Pollution tolerant midges and damselflies dominated the sample in place of the sensitive stonefly, mayfly, and caddisfly community found naturally in panhandle streams. Normally, leaf shredders like *Leuctra* stonefly and the *Anisocentropus* caddisfly are most common in the low order panhandle streams. These shedders feed on the hardwood leaf fall from the stream's riparian forest, which was eliminated by the impoundment (note picture). Impoundments become sumps for the fine particulate organic matter (FPOM) from the decay of plants killed by flooding caused by the dam. This FPOM that manifests as organic ooze, replaces fallen leaves as the main energy source for the aquatic community resulting in a dominance of midges. The habitat assessment rated a poor score of 23% due to an absence of available substrate (0%), lack of substrate diversity, low water velocity, and limited riparian buffer zone width. The total lack of available substrate was caused by a 100% smothering of stream habitat by mud/muck/silt (FPOM). The stream has a history of high nitrates (5.2 mgl/l 1972). The United States Geological Survey documented the nitrate concentrations during water quality monitoring of large-scale spray irrigation/fertilization activities on the lands that border East Fork Magnolia Creek. These activities used the watershed's high nitrate concentration groundwater to water crops on lands adjacent to the creek. Magnolia Creek is a tributary to Lafayette Creek, which is listed for biological impairment and pathogens (coliform bacteria) on the Florida's 1998-303(d) list for impaired waters for Total Maximum Daily Load Development.

Conclusions

The East Fork Magnolia Creek site above the road/dam did 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. Fine organic sediments smothering aquatic wildlife habitats and the hydraulic modification caused by the dam are the major source impacting stream health. The USFWS stream restoration project should restore the riparian forest buffer zone (eliminate sediment sources) and reestablish the natural hydrological conditions (including stream velocity) to improve Magnolia Creek's health. A post-restoration bioassessment will be made to confirm the expected return of a healthy population of stream wildlife. Historically, this sand hill watershed was intensely cultivated and needed large amounts of farm chemicals and water to compensate for the sandy soil. Because sandy soils allow chemicals to rapidly pass through them to the groundwater, there might be a potential source of fertilizer and pesticide/herbicide impact if intensive agriculture is again practiced

with chemical addition and large-scale irrigation. However, South Walton Utilities has a well field for the area's potable water supply within the watershed and pesticide and other chemical application would not be the appropriate best management practice to protect the drinking water supply.

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