EcoSummary

NPS BIOASSESSMENTS

PASS

East Fork Magnolia Creek below culvert on Owls Head Farm

January 18, 2006

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 second post-restoration biological assessment continued monitoring an Ecosystem Restoration Project in East Fork Magnolia Branch conducted jointly by South Walton Utilities Inc., Nokuse Plantation, and the United States Fish and Wildlife.



An earthen dam that impounded this stream reach was removed during 2003 and replaced with a large culvert to match bankfull stream channel. Floodplain drain culverts were placed at elevations to allow more natural stream flows. Additionally, sediment runoff from dirt roads was directed away from the stream and bare soils along the stream were vegetated. The pre-existing culvert had impounded the creek above the dirt road, which altered the stream's natural hydrology, impairing the downstream biological community. In addition, dirt road sediment, organic deposits created by the dam, and soil from dam failures smothered 95% of stream habitat in this reach below the road. This BioRecon documented the condition of the biological community as a measure of stream health approximately two years after the completion of the restoration.

Watershed Characteristics

The BioRecon sample reach (Latitude 30 degrees 34 minutes 7.1 seconds North, Longitude 86 degrees 4 minutes 49 seconds West) is located about 2.5 miles northeast of Freeport in Walton County. This East Fork Magnolia Creek site (STORET # 32010033) 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

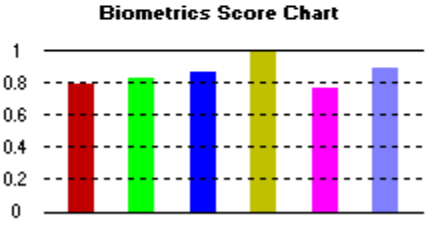
This East Fork Magnolia Creek site below the road culverts continued to improve by passing with a 9 of 10 BioRecon score indicating a healthy condition.

Biometrics	Metric Score
# TOTAL TAXA	0.79
# EPHEMEROPTERA TAXA	0.83
# TRICHOPTERA TAXA	0.86
# LONG-LIVED TAXA	1
# CLINGER TAXA	0.77
# SENSITIVE TAXA	0.89
TOTAL METRIC SCORE :	5.14
/ Correction Factor :	0.6
= BIORECON SCORE :	9

Pass 6 - 10
Fail 0 - 5

EAST FORK MAGNOLIA CREEK BLW CULVERT ON 1ST AMRE FRM AKA OWLS HEAD FARM REST PR

BioRegion : Panhandle West
Sample Date : Jan 18, 2006



During the 2003 pre-restoration biomonitoring this site failed to meet two of three biometrics in use before June 2004 to indicate an impaired condition. This pre-restoration background had a Taxa Richness of 27, Florida Index 20, and EPT 12. The habitat was scored a low suboptimal (54%).

The first post-restoration biomonitoring found significant improvement for the stream community (Taxa Richness 42, Florida Index 32, and, EPT 19); this included 3 stonefly taxa, the best indicator of water quality for panhandle streams. The habitat score improved marginally from 54% to 58%.

For the January 2006 bioassessment the Taxa Richness (42), FI (36), and EPT (21) continued to show some improvement and stoneflies increased to 5 taxa. Darter, shiners and salamanders were common. The habitat score improved to an optimal 72% from a suboptimal 58%. The following individual habitat parameters improved there scores: Substrate Diversity from suboptimal (12) to optimal (16), Substrate

Availability marginal (7) to suboptimal (14), Water Velocity suboptimal (15) to optimal (18), Habitat Smothering poor (3) to marginal (7), and Bank Stability from marginal (4) to suboptimal (6). Some sediments were flushed from this stream reach assisted by above normal annual rainfall for 2005 (89.62 inches of rain recorded at Eglin Air Force Base). This was second to the all time record of 104.36 inches in 1975 influenced by Hurricane Eloise and a nearly stationary tropical depression that produced over forty inches of rainfall. The sediments flushed by the increased rainfall improved Substrate Diversity/Availability and Habitat Smothering.

Conclusions

This second year after restoration bioassessment found East Fork Magnolia Creek continued to improve and 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. Removal of the dam upstream at the road has continued to benefit the stream's biological community at this site below the road. One more post-restoration bioassessment for January 2007 has been requested by the USFWS. Continued improvement of the stream health is expected. A near-complete recovery to the natural aquatic community is not expected until a mature riparian forest grows to shade the former impoundment reach. Native riparian and transitional streamside forest provide food and habitat (woody debris, leaves, root wads, terrestrial wildlife) for the stream's fish and wildlife. In addition to the canopy cover's shade cooling the water, which increases the dissolved oxygen concentration, the streamside forest anchors the stream banks, and contributes large snags that create riffles/pools vital to a healthy stream community.

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For more information on the DEP Bioassessment programs, please visit our web site at http://www.dep.state.fl.us/water/bioassess

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