FLORIDA AMBIENT

EcoSummary

Mare Creek below Mattie Kennedy Road

June 7, 2005

PASS

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 Blackwater River State Forest (BRSF) to monitor their proposed stream restoration project to reduce sediment runoff from Mattie Kennedy Road to Mare Creek. The BRSF has received a Section 319 Federal grant through the Florida Department of Environmental Protection (Grant #GO126) to implement the restoration. The Grant's focus is "... to improve the water quality of the Blackwater River through a significant reduction of sediment loads moving into the river system from adjacent forest roads in the project area." The BRSF project is a joint effort with the University of West Florida (UWF), FDEP, and United States Fish and Wildlife Service (USFWS). The UWF environmental studies department staff plans to place sediment traps to measure deposition of road runoff to Mare Creek before, during and after project improvements are implemented. The USFWS will provide recording rain gauges, technical assistance, and fish monitoring. FDEP District biologists are providing biological assessment of habitat and invertebrate communities before and after project improvements. Mare Creek, a third order stream at the sample reach (STORET # 33030158) drains the Southern Pine Plains and Hills subecoregion 65f. The sample site (Latitude 30 degrees 55 minutes 32.2 seconds North, Longitude 86 degrees 42 minutes 32.6 seconds West) is located about 6 miles northwest of Crestview. Mare Creek is a State listed Class III water body designated for recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Mare Creek is a tributary to the Blackwater River, which is classified as Outstanding Florida Waters (OFW) under the Florida Water Quality

Standards. The Blackwater River flows into Pensacola Bay via the Blackwater and East Bays. The Yellow River Marsh Aquatic Preserve, also listed as an OFW, is located along Blackwater Bay.

Results and Discussion

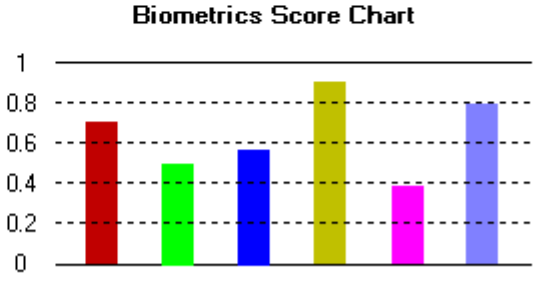
The BioRecon score at this Mare Creek site using the post-June 8, 2004 biometrics barely passed with a score of 6 out of 10.

Biometrics	Metric Score
# TOTAL TAXA	0.7
# EPHEMEROPTERA TAXA	0.5
# TRICHOPTERA TAXA	0.57
# LONG-LIVED TAXA	0.9
# CLINGER TAXA	0.39
# SENSITIVE TAXA	0.79
TOTAL METRIC SCORE :	3.85
/ Correction Factor :	0.6
= BIORECON SCORE :	6

Pass 6 - 10
Fail 0 - 5

MARE CREEK BLW MATTIE KENNEDY ROAD ECOPRTNRSHP W/BRSF

BioRegion : Panhandle West
Sample Date : Jun 07, 2005



The EPT (Ephemeroptera, Plecoptera, Trichoptera), the most robust indicator of stream health had only twelve taxa, which did not meet the pre-June 8, 2004 threshold of seventeen for healthy conditions. This site would have rated a suspect condition for pre-June 8, 2004 biometric thresholds measuring stream health, as it passed only 2 of the 3 biometrics applicable at that time. Road sediments smothered habitats and channel dredging affected Mare Creek's hydrology, altering the aquatic wildlife community structure. The population of EPT taxa, the major component of streams in the BRSF, was shifted to beetles and odonates. A 1998 BioRecon conducted one hundred meters below the road indicated impacts on the biota declined with distance from the bridge. A BioRecon at a downstream Mare Creek site, below East River Road, found significant improvement to its fish and wildlife community after the site was restored in 2004 by bridging a road ford to reduce dirt road runoff (see table).

Mare Creek Locations	**DATE**	**TAXA**	**EPT**	**FLORIDA INDEX**	**HABITAT ASSESSMENT**
5 meters below Kennedy Bridge	6/7/2005	39	12	22	61%
I00 meters Below Kennedy Bridge	3/3/1998	41	18	28	84%
Below East River Road Bridge	2/19/2004	55	27	32	88%
Below East River Road Ford	2/9/2000	36	28	16	61%
THRESHOLDS (pre-June 8, 2004)		**≥24**	**≥17**	**≥22**	**84%**

At this site, dredging to deepen the channel caused reduced water velocity that allowed organic

sediment deposition, resulting in lower dissolved oxygen (DO) concentrations. The DO concentration was only 4.1 mg/l in the dredged channel at the bridge. The State Water Quality Standard is 5 mg/l. The Habitat Assessment rated suboptimal at 61%. Habitat Smothering rated poor at 96% coverage, with habitats choked by clay/silt/sand. This left only 4 % Productive Habitat, which gave a poor rating. Substrate Diversity rated marginal with only two productive habitats available because of sediment deposition. Marginal ratings were given for Artificial Channelization, Bank Stability and Riparian Buffer Zone Width. All three were downgraded because of channel dredging and road sediment runoff in the upper 25 meters of the 100-meter sample reach. Mare Creek was stagnant above, at, and for 25 meters below the bridge due to dredging. Water Velocity 75 meters below the bridge, flowing at 0.34 meters a second, rated optimal. The Riparian Zone Vegetation Quality rated optimal because of a mature water chestnut oak hardwood forest canopy with a diverse sub-canopy of shrubs, which included mountain laurel and rhododendrons. Atlantic white cedars, common in Mare Creek's riparian zone downstream, were missing except for old stumps from logged trees observed along the creek. Mare Creek has been the only FDEP monitored stream in the BRSF with an intact mature, diverse riparian hardwood Forest. The other BRSF bioassessment sites have a history of intense logging and silviculture practices, which has left riparian zones dominated by planted pine with a titi sub-canopy and trees less than 50 years old. This change from a diverse old-growth hardwood riparian forest to a young pine monoculture limits the diversity and productivity of fish and wildlife in BRSF streams.

Conclusions

Mattie Kennedy Road at Mare Creek is a good candidate site for restoration work to reduce the sediment load from BRSF forest roads to OFW Blackwater River and the Pensacola Bay basin. The dirt road bridge approach is steep in both directions, with the eroded road sediment washing into Mare Creek on sides of the road. The site's wildlife habitat has the potential to be restored to optimal conditions. This is, in part, because of the existing excellent native forest cover and potentially optimal Riparian Buffer Zone Width. Restoring stream sinuosity and width/depth ratio to natural conditions near the bridge will increase productive habitat availability and water velocity, which in turn will improve DO. Upon completion of these restoration activities, the site's fish and wildlife community should return to optimal conditions as found at Mare Creek on East River Road.

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For more information on the DEP Bioassessment programs, please visit
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Mare Creek below Mattie Kennedy Road

