TMDL STUDIES

EcoSummary

Dade City Canal, downstream of River Rd in Plant City

April 29, 2005

VERY POOR

Stream Condition Index (SCI): The standardized biological assessment tool used by FDEP biologist to indicate ecosystem health and identify impairment as compared to reference (natural) conditions of streams within the various ecoregions of Florida

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.

Purpose

A biological assessment was performed on Dade City Canal in order to gain further information on the biological health of the watershed for use in Florida's Watershed Management and Biocriteria programs. Because this watershed is on the State of Florida's Impaired Water Rule's Verified List for Total Maximum Daily Loading (TMDL) development, the results may also be used in determination of TMDL needs and priorities. The verified parameter of impairment is dissolved oxygen. Biological methods are particularly useful in order to ascertain if low DO levels are indicative of natural conditions. If the aquatic community is not impaired, it may be concluded that low DO levels do not adversely effect the health of the system. However, if the biological community is impaired, it may be due to impaired habitat and not water quality.



The assessment method used, the Stream Condition Index (SCI), was developed by FDEP to determine the ecological health of streams and rivers. The SCI is based on ten

measurements that assess the ecological integrity of the aquatic macrioinvertebrate community. If the Index score falls between 73 and 100, it is considered good; if it falls between 46 and 72, fair; between 19 and 45, poor; and between 0 and 18: severely degraded.

Watershed Characteristics

Dade City Canal is a man-made canal constructed in order to drain the area northeast of Dade City for agricultural use. Until recently, it also was the receiving water body for effluent from a citrus processing plant. The Dade City Wasterwater Treatment Plant discharged for many years into the upper reaches where it is called Larkin Canal. The WWTP no longer has a surface water effluent.

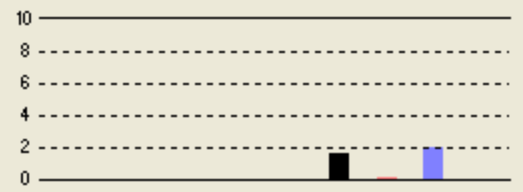
The majority of the canal flows through Little Everglades Ranch, where peat is harvested and some cattle and horses are raised. The cattle and horses are fenced away from the canal. Upon leaving the Ranch property, the canal enters the Withlacoochee River floodplain wetlands and eventually reaches the Withlacoochee River.

Results

The sampling site was located just east of US 301, downstream of the River Road bridge crossing. Water flow was imperceptible. The banks of the canal had recently been mowed to stubble. The lack of shade permitted algal mats to cover the bottom. It is possible that the grass mowed from the banks was allowed to fall into the canal. The bottom was mucky with decaying vegetation and algae. There was little productive habitat for aquatic invertebrates and fish.

Historical monitoring indicates that the dissolved oxygen (DO) level in Dade City Canal frequently falls below the State Standard of 5.0 mg/l during all seasons of the year. However, it is natural for swampy streams connected to wetlands to have average DOs below 5 mg/l because of their large organic constituent. On the day of sampling, the DO was 1.14 mg/l. The temperature was 18.6 deg. C, the pH was 6.58 NTU, and conductivity was 152 umho/cm. The habitat score was 65 out of a possible 160 points, in the marginal catagory, due to the box-cut channelization, sluggish flow and unprotected riparian zone. The SCI score was 4, which is in the very poor category. The macroinvertebrates were not diverse, and there were no organisms sensitive to environmental conditions, including DO content. Over 90% of the aquatic macroinvertebrate community were "very tolerant" organisms.

DADE CITY CANAL, DOWNSTREAM OF RIVER RD IN PLANT CITY



BioRegion : Peninsula

Sample Date : Apr 29, 2005

Good	73 - 100
Fair	46 - 72
Poor	19 - 45
Very Poor	0 - 18

Core Metrics	Value	0 - 10 Points	Metric Score
# TOTAL TAXA	16	16 - 41	0
# EPHEMEROPTERA TAXA	0	0 - 5	0
# TRICHOPTERA TAXA	0	0 - 7	0
# CLINGER TAXA	0	0 - 8	0
# LONG-LIVED TAXA	0	0 - 4	0
# SENSITIVE TAXA	0	0 - 9	0
% DOMINANT TAXON	46.85	54 - 10	1.63
% SUSPENSION FEEDERS / FILTERERS	1.35	1 - 40	0.09
% TANYTARSINI	0.9	0 - 26	1.95
% VERY TOLERANT	90.99	59 - 0	0
	TOTAL METRIC SCORE :		3.67
	/ Correction Factor :		0.9
	= SCI FINAL SCORE :		4

Macroinvertebrate Dip Net (20 sweeps, emphasizing most productive substrates)

Significance

The FDEP's Impaired Waters Rule has identified dissolved oxygen as a parameter of concern for Dade City Canal. The DO measured at this time was well below the 5.0 mg/l State Standard and the macroinvertebrate community was impaired. However, the biological community is also affected by habitat conditions. This was the case at a site further downstream in the Canal (please see TP256-Dade City Canal, April 29, 2005). The conditions at the River Road site were not natural; they were caused by the practice of mowing the riparian zone, eliminating shade and buffer protection, and resulting algal blooms.

Suggestions

Dade City Canal is a man-made conveyence intended to divert stormwater from the Dade City area and to drain wetlands for agriculture. The upper reaches received effluent discharge from two facilities for many years. Dade City Canal may never be able to achieve the water quality and biological expectations of a flowing stream, but its conditions can be improved through riparian restoration and Best Management Practices. An adequate riparian buffer zone would protect the canal from polluted stormwater runoff and provide shade, thus preventing extreme algal blooms. Mowed grass and yard waste should never be thrown in the water; this applies to homeowners as well as municipalities. An improvement in water quality and biological community can be seen at the station further downstream on Little Everglades ranch (TP256-Dade City Canal, April 29, 2005).

For more information, please contact
Peggy Morgan
Southwest District Office
13051 N. Telecom Pkwy, Tampa, FL 33637
(813) 632-7600 x 490 (Suncom 514-9155 x 490)
E-mail: Peggy.Morgan@dep.state.fl.us

Published by the Florida Department of Environmental Protection
Tallahassee, Florida
For more information on the DEP Bioassessment programs, please visit our web site at http://www.dep.state.fl.us/water/bioassess

Dade City Canal, downstream of River Rd in Plant City

