EcoSummary

TP256-Dade City Canal
April 29, 2005

POOR

TMDL STUDIES

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 recieving water body for effluent from a citrus processing plant. 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.

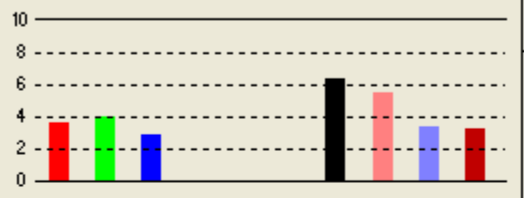
The sampling site was located just prior to where the canal leaves Little Everglades Ranch property. It was clear, tannic and sluggish. Emergent vegetation was abundant (*Hydrocotyl* and *Myriophyllum aquaticum*) with *Slavina minima* floating on the surface. The riparian zone was only 2 to 3 feet wide on both sides.

Results

Historical monitoring indicates that the dissolved oxygen (DO) has frequently been below the State Standard of 5.0 mg/l. 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 2.88 mg/l. The temperature was 20.37 deg. C, the pH was 7.26 NTU, and conductivity was 268 umho/cm. The habitat score was 98 out of a possible 160 points, due mainly to the box-cut channelization and poorly protected riparian zone. The SCI score was 32, which is in the poor category. The macroinvertebrates were fairly diverse, but there were no organisms sensitive to environmental conditions, including DO content.

TP256-DADE CITY CANAL

Stream Condition Index Metric Scores



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	25	16 - 41	3.6
# EPHEMEROPTERA TAXA	2	0 - 5	4
# TRICHOPTERA TAXA	2	0 - 7	2.86
# CLINGER TAXA	0	0 - 8	0
# LONG-LIVED TAXA	0	0 - 4	0
# SENSITIVE TAXA	0	0 - 9	0
% DOMINANT TAXON	26	54 - 10	6.36
% SUSPENSION FEEDERS / FILTERERS	22.5	1 - 40	5.51
% TANYTARSINI	2	0 - 26	3.33
% VERY TOLERANT	15	59 - 0	3.24
	TOTAL METRIC SCORE :		28.9
	/ Correction Factor :		0.9
	= SCI FINAL SCORE :		32

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. The available substrate for macroinvertebrates is dominated by emergent vegetation, limiting the community to those organisms utilizing macrophytes. The bottom is very organic and water velocity is extremely sluggish. The low DO levels are at least partly due to natural conditions.

Suggestions

Dade City Canal is a man-made conveyence intended to divert stormwater from the Dade City area and to drain wetlands for agriculture. Best Management Practices (BMPs) for cattle ranching are in place: the cattle and horses are largely fenced away from the creek. The water quality (particulary DO) and the biological community will be improved only if the hydrology and instream habitat are improved. True restoration would involve severing the canal and allowing the surrounding agricultural lands to return to wetlands.

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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

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