EcoSummary

Cedar Creek, at Jackmar Rd
May 19, 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



Macroinvertebrate samples were collected for a Stream Condition Index (SCI) bioassessment of Cedar Creek in order to gain further information on the biological health of the watershed for use in the administration of Florida's Ecosystem Management Water Quality Assessment and Total Maximum Daily Loads programs. Because this watershed is on the State of Florida's Impaired Water Rule's List for Total Maximum Daily Loading (TMDL) development, the results may also be used in determination of TMDL needs and priorities. The verified parameters of impairment are dissolved oxygen and nutrients. 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.

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

Cedar Creek is a small basin in northwestern Pinellas County, draining northern Dunedin and emptying into Saint Joseph Sound. The entire basin is only about 1 ¾ mile long, over ½ of which is tidal. The tidal area is contained almost entirely within Hammock Park and is natural in the western reach of the park where it enters Saint Joseph Sound. The upper reaches are fresh water and channelized, functioning as a stormwater conduit.

The sampling site is located alongside Jackmar Road, where a small bridge for golfcarts spans the creek. The stream is straight, with gunnite walls covered with vines and ferns; channelization occurred quite some time ago. The watershed is heavily urbanized. Long-term water quality trends have shown the dissolved oxygen levels in Cedar Creek to drop below the State Standard of 5.0 mg/l, particularly in the summer months. It is likely other pollutants are introduced into the creek, such as nutrients and hydrocarbons. The aquatic macroinvertebrate community has never been sampled in the watershed.

Results

At the time of sampling, the stream was about 0.3 m deep. The habitat assessment score was 69 out of 160, which places it in the marginal category for habitat characterization. The low score was due to channelization and lack of sinuoisity, in-stream habitat and riparian buffer zone. Dissolved oxygen was 11.77 mg/l, conductivity was 622 umho/cm, pH was 8.56 SU and temperature was 30.13 deg. C.

The SCI score was 40 out of 100, falling in the "poor" category. This means that the aquatic macroinvertebrate community was impaired and the stream was not meeting the designated use for a Class III waterbody, which is the maintainance of a healthy biological community.

Significance

The FDEP's Impaired Waters Rule has identified dissolved oxygen as a parameter of concern for Cedar Creek. The DO measurement taken on 5/19/05 was much higher than the State Standard of 5.0 mg/l. A DO level above 10 mg/l means that the surface water is greater than 100% saturated with oxygen. This condition typically indicates increased algal metabolism during daylight hours. A high pH measurement (> 8 SU) also is typical of increased photosynthetic activity. When the algae dies, decomposition leads to oxygen depletion, with wide fluctuations between day and night. These extremes prevent the maintainance of a healthy biological community and may result in fish kills. The biological assessment on 5/19/05 resulted in a poor SCI score. Although there are habitat inadequacies that influence the macroinvertebrate community, it may be concluded that the biological community is adversely impaired by DO fluctuations, and that these fluctuations are largely from human pollution.

Suggestions

Cedar Creek functions as a stormwater drainage system for residential and urban development, as do many streams in Pinellas County. Stormwater runoff is directly piped or ditched to the creek in order to prevent flooding by carrying excess rainwater away from streets, homes, and businesses. Because much of the system contains no filters or other types of pre-treatment, it also serves the unintended function of carrying urban pollution straight into the stream and St. Joseph Sound, where excess nutrients can cause harmful algal blooms. Rain, industrial and household water mixed with urban pollutants creates storm water pollution. The pollutants include: oil, and other automobile fluids, paint and construction debris, yard and pet wastes, pesticides and litter. Urban runoff

contaminates streams, rivers and bays, harms aquatic life and increases the risk of flooding by clogging storm drains and catch basins. Stormwater runoff Best Management Practices (BMPs) need to be expanded by the private sector as well as public agencies. Pinellas County and local municipalities have BMPs in place in some areas, but others, such as the Cedar Creek watershed, need to be introduced and/or improved. These improvements include engineering retrofits, created wetlands and vegetative swales, . Homeowners can also reduce stormwater runoff pollution by limiting lawn fertilization and removing yard waste so that it does not enter the stream with stormwater runoff.

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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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