



EcoSummary

Williams Creek, Manatee County.
Manatee River Watershed
September 30, 1998



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

Purpose

Macroinvertebrate samples were collected for an Stream Condition Index (SCI) bioassessment of Williams 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 (EMWQAS) and Total Maximum Daily Loads programs. A field biorecon, a rapid screening method for identification of biological impairment, was also performed. Surface water samples were collected for analysis of parameters of concern. All work conducted by EMWQAS was conducted according to established DEP standard operating procedures and quality assurances plans. The Stream Condition Index (SCI) is based on seven measurements that assess the ecological integrity of the invertebrate community. If the Index score falls between 27 and 33, it is considered 'excellent'; if it falls between 21 and 26: 'good'; between 14 and 20: 'poor'; and between 7 and 13: 'severely degraded'. Biorecons are based on three measurements of the aquatic invertebrates present in the stream: the total number of different species (Total Taxa), the number of "good water quality" indicator species (Florida Index) and the total number of Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) species present. A stream scoring above the threshold value for all three of these measurements is considered healthy. If two of the threshold values are reached, the stream's health is considered ecologically suspect. If only one or none of the thresholds are reached, an impaired condition is concluded.

Background

Williams Creek, located in south western Manatee County, flows into the Braden River south of the town of Elwood Park. The Braden River empties into the Manatee River Estuary on the eastern boundary of Bradenton. Williams Creek has been channelized and its riparian zone altered. The drainage basin consists primarily of urban development, with a small amount of pasture and cropland. Historically, high levels of coliform bacteria have been sampled in Williams Creek. The average value of 172 samples taken at the same site from 1980 to 1987 were 2400 and 1260 colonies/100 ml for total and fecal coliforms, respectively. This suggests that levels well above state water quality standards were a frequent occurrence. Manatee County Environmental Action Commission (EAC) conducts on-going monitoring in the watershed. They attributed the high levels to cattle ranges, which was the predominant land use in the watershed at that time. They also suggested that naturally occurring plant

and soil bacteria, such as *Klebsiella* are common interferers in coliform methodology, and may result in excessive levels of coliforms that are not attributable to fecal matter.

Results

Physicochemical parameters were measured and water samples for chemical analyses were collected on the upstream side of the Caruso Street bridge. There has been recent development in the area, although not immediately adjacent to the stream. The water was tannic and turbid, and velocity was sluggish. Southwest Florida Water Management District (SWFWMD) land use coverage indicated some sort of feeding operation located upstream. Although we observed a large barn with two silos surrounded by pasture, there were only five horses present, one of which was being trained by a man. There are several large new homes in the area with small stables for limited horse ownership. The habitat score was 89 out of 160, in the upper marginal category. The riparian zone was reduced and colonized by opportunistic vegetation, including some exotics. There was very little in-stream habitat. Dissolved oxygen (DO) was above the State standard of 5.0 mg/l (Rule 62 - 302 FAC), at 5.84 mg/l. The total nitrogen (TN) concentration was moderately high as compared to typical values of Florida streams (1.69 mg/l). Ammonia-nitrogen was slightly elevated (0.12 mg/l). The total phosphorus (TP) measurement was quite high (1.0 mg/l), although TP values can be higher in south-central Florida than in streams from other areas of the state because of the natural phosphatic deposits here. The turbidity measurement was moderately high. Fecal coliforms exceeded the single day standard for Class III waterbodies (Rule 62 - 302 FAC), at 1010 colonies/100 ml. Total coliforms, while not in excess of the single date standard, were quite high, at 1600 colonies/100 ml. Williams Creek failed all three parameters of the Biorecon, indicating an impaired macroinvertebrate community. However, the SCI score was 27, rating the invertebrate assemblage as 'excellent'. This discrepancy was most likely due to sampling effort. In-stream habitat was limited and not of high quality. The SCI methodology allows for a more thorough sampling of what should be the most productive habitats, thereby increasing the chances of collecting a more diverse community. However, the values for Florida Index and EPT were also low for the SCI (5 and 3, respectively), indicating that the other parameters of the SCI were responsible for the high rating.

Significance

The excessive levels of total and fecal coliforms suggest the contamination found in the 1980s is still a problem today. Cattle ranging is still a predominant industry in the watershed. These levels present a potential health hazard. The results of the macroinvertebrate assessments indicate an unclear ecological condition. The lack of pollution sensitive organisms (EPT and Florida index fauna) suggests that the stream is not as healthy as it should be. This may be due to water chemistry or habitat and hydrological alterations, or a combination of both. Impairment to the aquatic macroinvertebrate community can result in reductions of fish and bird populations in the Braden and Manatee River watersheds.

Suggestions

An investigation in the watershed of Williams Creek should be conducted in order to determine the pathogenic content of the coliforms, after which the appropriate steps can be taken to end the contamination and restore the creek to ambient coliform levels. Physical restoration of the riparian zone will be necessary in order to reestablish aquatic habitat, stabilize banks and provide a buffer to stormwater runoff.

For more information, please contact:

Peggy Morgan

DEP Southwest District 3804 Coconut Palm Drive Tampa, Florida
33619

(813) 744-6100

email: morgan_p@tpa1.dep.state.fl.us

Published by the Florida Department of Environmental Protection,
Tallahassee, FL.

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