



EcoSummary

Whidden Creek, Polk County, Peace
River EMA
August 24, 1998 - August 24, 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 SCI bioassessment of Whidden 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. 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

Whidden Creek, located in southeastern Polk County, flows into the Peace River south of Fort Meade. The drainage basin consists primarily of phosphate mining, with a small amount of citrus and pasture. Much of the area adjacent to the stream has been mined by the phosphate industry. Historically, water chemistry data have shown an average dissolved oxygen level below State standards (4.5 mg/l) and excessive values for mean total nitrogen and phosphorus (2.2 and 3.9 mg/l, respectively).

Results

Physicochemical parameters were measured and water samples for chemical analyses were collected

upstream of the Hwy 17 bridge. Water velocity was consistent and moderately rapid; and the water appeared slightly turbid. The habitat score was 140 out of 160, in the optimal category. The physicochemical and water chemistry results were within acceptable ranges with the exception of total phosphate (TP). The TP measurement exceeded the highest concentration used in the 1996 FDEP 305(b) Water Quality Report. The TN, or total nitrogen, concentration was fairly low (0.77 mg/l), with slightly elevated nitrates and ammonia nitrogen. Conductivity and sulfate levels were also elevated. Total and Fecal Coliforms, 590 and 190 colonies/100ml, respectively, were within the single day state standard (Rule 62 - 302 FAC). The Biorecon results indicated that the health of the macrobenthic community was below expectations for an unimpacted stream, falling into the suspect category. It exceeded the thresholds for taxa richness (19, threshold is 18) and Florida Index (11, threshold is 10), but did not reach that for EPT Index (3, threshold is 4). However, the SCI score was 29, indicating that the macroinvertebrate community is similar to that of the least impacted streams in southwest Florida, and that Whidden Creek had met its designated use at the time of sampling.

Significance

Excessive concentrations of TP were being introduced into Whidden Creek at the time of sampling. This is typically found in streams draining areas of phosphate industrial activity and mining. The levels did not result in a degraded macroinvertebrate community at the time of sampling. However, Whidden Creek flows into the Peace River, and ultimately into Charlotte Harbor, where accumulated nutrients may result in degraded water quality, including algal blooms and associated oxygen depletion.

Suggestions

The development of best management practices for phosphate industrial activities and mining, in all the tributaries of the Peace River where applicable, is important when managing the ecological integrity of the Charlotte Harbor ecosystem.

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