EcoSummary

Whidden Cr at Unnamed Rd off of Rt 17/35

March 10, 2004

TMDL STUDIES

EXCELLENT

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



Two macroinvertebrate samples were collected for a Stream Condition Index (SCI) bioassessment of Whidden Creek in order to gain further information on the biological health of the watershed for use in the administration of the Total Maximum Daily Load (TMDL) program. The SCI's were performed on 7/22/03 and 3/10/04.
Whidden Creek was listed on the 1998 303D Impaired Waters List for the following parameters: Dissolved Oxygen, Nutrients, Total Suspended Solids, and Turbidity. The 2004 Planning and Verified Impaired lists included no impaired parameters for the water body. The 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'. All work carried out by the Southwest district biologists was conducted according to established FDEP standard operating procedures (SOP's) and quality assurances plans.

Background

Whidden Creek is predominantly fresh water Class 3 system (Chapter 62-302 State Water Quality Standards) with designated uses of recreation and the propagation and maintenance

of a healthy, well-balanced population of fish and wildlife. Whidden Creek, located in Polk County, flows east into the Peace River. The Peace River flows south/southwest into Charlotte Harbor. The sampling site in Whidden Creek is located west of Hwy 17/35 on an unnamed road, approximately 2 miles south of Fort Meade in Polk County (Latitude 27 degrees 42 minutes 27.3 seconds N, Longitude 81 degrees 48 minutes 58.1 seconds W). Whidden Creek itself has been channelized in the past, but has recovered significantly, with its riparian zone being somewhat restored. The drainage basin consists primarily of extractive land; land that has been mined for phosphate and fertilizer industries. There are some commercial and transportation services that drain into the basin, along with a small amount of cropland, mainly citrus. Historically, high levels of pollution sources in the basin were nutrients, primarily phosphate, due to past and recent mining activities.

Results

Physicochemical parameters were measured upstream of the bridge. Dissolved oxygen was above the State standard of 5.0 mg/l, with a slightly higher than normal conductivity value (Rule 62 - 302 FAC) on both sampling dates. Water velocity was measured for both sampling days between suboptimal and low-optimal ranges, 0.2 m/s and 0.25 m/s, respectively. The habitat scores were 100 and 108 out of 160, both in the suboptimal category. Mining activities that took place all around the basin is the key factor for the lower habitat assessment scores in these components: decreased substrate availability, increased habitat smothering and reduced riparian zone quality. The surrounding basins are entirely strip-mined, with a few areas of citrus lands. This is most likely the cause of heavy sedimentation in the headwaters of the tributary, resulting in the smothering of productive habitat. The stream has recovered from the extraction practices of the surrounding phosphate industries, however it has not restored itself so that it would attain an optimal habitat score. A score in the range of suboptimal for the habitat assessment would indicate a fair to good macroinvertebrate community. A good water velocity has a role in recruitment. Macroinvertebrates prefer habitat that is situated in good flow. Active biological recruitment since the mining has subsided allowed for a much higher than anticipated SCI score of 29 on both sampling dates, rating the aquatic invertebrate assemblage as excellent. The total number of taxa was 26 and 23, which is considered high diversity. The site scored high on the EPT, a parameter that measures how many pollution sensitive mayflies and caddisflies were collected. Another important sensitivity parameter is the Florida index, on which the stream did very well, with scores of 12 and 10, respectively.

Significance & Suggestions

The mining practices in the basin have had an effect on habitat availability, habitat smothering, flow and riparian zone quality and extent. The presence of sedimentation by shifting sand and habitat smothering was a direct effect from the phosphate industry practices and citrus row-crops. Some recovery has occurred, allowing for a healthy macroinvertebrate community to return to Whidden Creek, and water quality has improved. An ecologically healthy invertebrate community will continue to thrive in Whidden Creek in the low-pollution situation it is in now.

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