EcoSummary

Reedy Creek downstream of US Hwy 17/92, Osceola County
July 7, 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.

Introduction

Reedy Creek is a major tributary to the Kissimmee chain of lakes. The stream originates in the vicinity of Reedy Lake immediately west of Walt Disney World. Numerous canals and natural and manmade lakes and ponds on the Disney property have outflows that eventually empty into Reedy Creek. After passing under Interstate 4, the dark, slow-moving swampy creek flows in a southeasterly direction until it enters Lake Russell near the south end of Lake Tohopekaliga (a.k.a. Lake Toho). It then exits Lake Russell to flow into the west end of Cypress Lake. Cypress Lake is connected via the Hatchineha Canal to Lake Hatchineha, which forms the headwaters of the Kissimmee River. Fifty-two percent of the land in the Reedy Creek watershed is natural wetlands with some uplands. Agriculture accounts for 28% of the land use. One tenth of the land in the basin has undergone residential development. The remainder is field/pasture (9%) and industrial developments (1%). This stream was placed on the 303(d) list due to dissolved oxygen, coliform bacteria, and turbidity violations, as well as elevated nutrient levels. Waterbodies on the 303(d) list are required to undergo a Total Maximum Daily Load (TMDL) study. The purpose of the TMDL is to determine the amount of pollution reduction needed to restore the system to a condition suitable for its designated use. In this case, the designated use is for recreation and maintenance of a healthy, well-balance aquatic community. DEP's Central District Surface Water Monitoring staff was requested to assess the status of selected waterbodies that were placed on the TMDL list with limited data. Limited data waterbodies were those with less than 10 observations in the STORET database, with the most recent observations occurring prior to 1990, or those with qualitative, non-point source survey data only.

Results and Discussion

Benthic macroinvertebrate communities, physical/chemical parameters, and nutrients were sampled on July 7, 1998. Coliform bacteria and physical/chemical parameters were sampled on March 24, 1999. Macroinvertebrate communities were sampled from in-stream habitats using 20 dipnet sweeps, which were composited. A minimum of 100 organisms were subsampled to get a qualitative and semi-quantitative picture of the ecological health of the invertebrate community (the SCI procedure). The results of the SCI indicate that Reedy Creek at US 17/92 is in suboptimal ecological condition. There were 25 different macroinvertebrate taxa collected in the subsample, 16 of which were dipteran (fly) larvae. The only member of the EPT (larval mayflies, stoneflies, and caddisflies) group collected was the mayfly Caenis. Four points were scored for the Florida Index, a measurement based on the number of good water quality indicator species present in a water body. The dominant macroinvertebrate present in the sample was the isopod Caecidotea occidentalis, followed by clams in the family Sphaeriidae. Total coliform bacteria counts at Reedy Creek were 233 colonies/100mL. Although fairly high, this value does not represent a violation of standards. Fecal coliform bacteria levels were low: 30 colonies/100mL. The violation threshold is 800 colonies/100mL. The dissolved oxygen level measured on 7/7/98 was 2.2 mg/L. On 3/24/99 it was 3.3 mg/L. Both are below the state standard of 5.0 mg/L. Turbidity was only 1.3 NTU at the time that it was sampled. Some nutrient levels, however, were quite high. Nitrate/nitrite was found to be present at a level of 0.60 mg/L, which is extremely high. Total ammonia was also fairly high, at 0.063 mg/L. Total phosphorus and total Kjeldahl nitrogen (TKN), on the other hand, were not particularly high. They measured 0.08 mg/L and 0.89 mg/L. respectively.

Conclusions

The very low dissolved oxygen levels found here are probably natural for a very slow, tannic, swampy stream like Reedy Creek. Turbidity does not appear to be a problem now. Previously, there had been bridge and road construction taking place where the creek is crossed by Interstate 4 and also at the US Hwy 192 crossing. This might have contributed to the earlier elevated turbidity readings. This construction has now been completed. Likewise, fecal coliforms were at low levels when sampled in March 1999, as opposed to earlier measurements which represented violations. Some of the nutrient measurements, however, are a different matter. The nitrate/nitrite reading of 0.60 mg/L is extremely high, especially for a darkwater system like this. Although no nutrient standard currently exists under Florida statutes, the rule does state that the levels of nutrients cannot cause an imbalance in flora or fauna. Given the very high nitrate/nitrite concentration in the water here and the suboptimal macroinvertebrate community seen, this seems to have occurred. Nearby Davenport Creek, a similar but smaller ecoregional reference stream, had much better results when last sampled in September 1997. Therefore, we recommend that Reedy Creek remain on the 303(d) list.

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