TMDL STUDIES

EcoSummary

LAKE LENA RUN @S. SIDE OF US92 (SR600)
January 31, 2005

VERY POOR

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



A biological assessment was performed on Lake Lena Run in order to gain further information on the biological health of the watershed for use in Florida 's Watershed Management and Biocriteria programs. Because this watershed is on the State of Florida 's 303(d) List for Total Maximum Daily Loading (TMDL) development, the results may also be used in determination of TMDL needs and priorities.

The assessment method used, the Stream Condition Index (SCI), was developed by FDEP to determine the ecological health of streams and rivers. The SCI is based on ten measurements that assess the ecological integrity of the aquatic macrioinvertebrate community. T he Index score falls between 1 and 100; a score of 80 and above is indicitive of pristine, completely unimpaired conditions. A score below 35 is considered severely impaired.

Watershed Characteristics

Lake Lena Run is located in Auburndale, in central Polk County. Itoriginates at the southern discharge point of Lake Lena and flows through mined land and into Lake Hancock . Most of the stream length has been channelized. Lake Lena Run receives surface water discharges from Florida Distillers and the City of Auburndale Wastewater Treatment Plant in its upper reaches. Lake Lena and the upper reaches of Lake Lena Run are heavily urbanized and industrialized, but the lower reaches have more natural landuse, as well as cropland, pastureland and a small amount of phosphate mining.

The sampling site was located south of US 92 downstream of Lake Lena, and was essentially lake water discharge. A second location futher down in the watershed was sampled the same day (see separate report).
Lake Lena Run has been placed on the 303(d) list due to the following parameters of concern: dissolved oxygen, total and fecal coliform bacteria, nutrients, turbidity, and total suspended solids, based on water quality data from 82 historical (1970 to 1983) observations and eight (8) observations from 1992. Currently, it is on the Impaired Water Rule (IWR) planning list for biology, dissolved oxygen and fecal coliforms. It is on the IWR Verified List for dissolved oxygen (DO); values frequently fall below the State Standard of 5.0 mg/l

Results

This location in Lake Lena Run consisted entirely of urban and industrial land use. The stream was predominantly sandy bottom with minimal substrate available for invertebrate and fish use (13% aquatic vegetation, mosty exotics). The water was shallow, slightly green and flowing moderately at 0.12 m/s. The riparian zone was highly disturbed and non-existent on the east bank, and consisted mainly of exotic species

The SCI score was 18, indicating that the macroinvertebrate community was severely impacted. Table 1 shows, most notably, that not a single environmentally sensitive species was collected. There was just one species of mayfly (Ephemeroptera), and just two caddisfly (Trichoptera) species. Mayflies and caddisflies are among the more sensitive invertebrates, but the species found here are considered fairly tolerant of pollution.

Table 1.

# Ephemeroptera	% Suspension and Filter Feeders	# Long-Lived Taxa	# Clinger Taxa	% Dominant Taxa	# Sensitive Taxa	% Tanytarsini	Total # Taxa	% Tolerant Taxa	# Trichoptera Taxa
1	0	0	0	15.9	0	0	21	41.1	2

The DO measurement was above the 5.0 mg/l State Standard (Table 2). All other physicochemical metrics were within normal values.

Table 2.

Time	Temperature (deg. C)	Conductivity (umho/cm)	Dissolved Oxygen (mg/l)	pH (SU)	Clarity	color	Water velocity (mg/l)
1030	17.81	247	6.06	6.93	slightly turbid	greenish	0.12

Significance

Biological sampling at this location indicates that the invertebrate community is severely impaired. Hence, Lake Lena Run does not maintain a healthty, well-balanced biological population as it emerges from Lake Lena Run.

Suggestions

The water quality at this location in Lake Lena Run is a reflection of that of Lake Lena. The Lake is completely surrounded by residential development and roads, and is subject to stormwater runoff pollution. The pollutants include: oil, and other automobile fluids, paint and construction debris, yard and pet wastes, pesticides and litter. Stormwater runoff Best Management Practices (BMPs) need to be expanded by the private sector as well as public agencies. These improvements include engineering retrofits, riparian zone stabilization vegetative swales, and created wetlands. Due to the fact that much of Lake Lena is surrounded by privately owned homes, the water quality is particularly affected by private citizens. Homeowners can reduce stormwater runoff pollution by limiting lawn fertilization and removing yard waste so that it does not enter the stream with stormwater runoff. The restoration and maintainance of the natural vegetation in the riparian zone helps by increasing nutrient uptake and stabilizing the lake edge.

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