TMDL STUDIES

EcoSummary

Curlew Creek, at Saddle Hill Dr bridge, Dunedin
May 19, 2005

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 Curlew Creek 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 Impaired Water Rule's Verified List for Total Maximum Daily Loading (TMDL) development, the results may also be used in determination of TMDL needs and priorities. The verified parameters of impairment are nutrients and coliforms. Biological methods are particularly useful in determining the ecological health of surface water.

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

Curlew Creek is a fairly large second order stream that drains the north-central portion of Pinellas County, flowing west to St Joseph's Sound just north of Dunedin. The watershed is heavily urbanized. Stormwater pipes can be seen emptying into the creek at nearly every road crossing; clearly Curlew Creek functions as a stormwater conduit. The banks are steeply incised, indicating large fluctuations in water level after heavy rainfalls, which erodes and scours the streambanks. Mid-County Services, a waste water treatment plant, discharges into the Creek in the upper reaches of the watershed.

The sample site was located at Saddle Hill Drive, in a residential neighborhood. This location was much further upstream of another Curlew Park site that was sampled on the same day (Curlew Creek at Curlew Park).

Results

The instream habitat in Curlew Creek at this location was predominantly sandy bottom with minimal substrate available for invertebrate and fish use (8%.snags, rock rubble, leaves and aquatic vegetation). The stream was 0.5 m deep and flowing moderately at 0.15 m/s. Located in a residential neighborhood, the riparian zone was narrow, only about 5 m on each side.

The SCI score was 28, indicating that the water quality and in-stream habitat do not support a healthy biological community. Table 1 shows that only one environmentaly sensitive species was collected. There were no mayflies (Ephemeroptera), which are generally consided sensitive and just one caddisfly (Trichoptera) species. Caddisflies are also among the more sensitive invertebrates, but the species found is considered fairly tolerant of pollution. Forty two percent of all taxa were pollution-tolerant stream invertebrates.

Table 1. SCI metric values.

# Ephemeroptera	% Suspension and Filter Feeders	# Long-Lived Taxa	# Clinger Taxa	% Dominant Taxa	# Sensitive Taxa	% Tanytarsini	Total # Taxa	% Tolerant Taxa	# Trichoptera Taxa
0	20.59	2	2	39.22	1	2.94	16	42.16	1

The conductivity was elevated, at 560 umho/cm (Table 2). Elevated conductivity is typical of urban streams that receive large amounts of stormwater runoff. Dissolved oxygen and pH were also relatively high and may or may not reflect excessive photosynthetic activity by phytoplankton.

Table 2. Physicochemical measurements

Time	Temperature (deg. C)	Conductivity (umho/cm)	Dissolved Oxygen (mg/l)	pH (SU)	Clarity	color	Water velocity (mg/l)
1010	25.8	560	8.31	7.73	Clear	Clear	0.15

Significance

Biological sampling at this location indicates that the invertebrate community is impaired. Hence, Curlew Creek does not maintain a healthty, well-balanced biological population.

Suggestions

Curlew Creek functions as a stormwater drainage system for residential and urban development, as do many streams in Pinellas County. Stormwater runoff is directly piped or ditched to the creek in order to prevent flooding by carrying excess rainwater away from streets, homes, and businesses. Because much of the system contains no filters or other types of pre-treatment, it also serves the unintended function of carrying urban pollution straight into our streams, estuaries and the Gulf of Mexico. Rain, industrial and household water mixed with urban pollutants creates storm water pollution. The pollutants include: oil, and other automobile fluids, paint and construction debris, yard and pet wastes, pesticides and litter. Urban runoff contaminates streams, rivers and bays, harms aquatic life and increases the risk of flooding by clogging storm drains and catch basins. Stormwater runoff Best Management Practices (BMPs) need to be expanded by the private sector as well as public agencies. Pinellas County and local municipalities have BMPs in place in some areas, but other watersheds need to be improved. These improvements include engineering retrofits, riparian zone stabilization vegetative swales, and created wetlands. Home owners can also reduce stormwater runoff pollution by limiting lawn fertilization and removing yard waste so that it does not enter the stream with stormwater runoff

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