



EcoSummary

Livingston Creek upstream of Rucks

Dairy Road

February 18, 1997 - March 8, 1999



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

Livingston Creek upstream of Rucks Dairy Road (N 27 degrees, 42' 29.69", W 81 degrees, 26', 49.33") has been used as an FDEP biological reference site since July 1992. It was chosen as a reference site because it represents one of the least impacted streams of its type in this area of the state.

Bioassessments have consistently shown excellent results.

Background

Livingston Creek is located in southern Polk County between the cities of Frostproof and Avon Park. It originates in Lake Livingston, and flows basically eastward. It is joined from the north by Reedy Creek south of Reedy Lake, and from the south by an unnamed stream originating at Lake Isabell in Avon Park. Livingston Creek flows into the north end of Lake Arbuckle within the Lake Arbuckle State Forest. The sampling site upstream of Ruck's Dairy Road is also within the state forest. Land use in the watershed is roughly 25% each of natural land, silviculture, and field or pasture. Approximately 20% of the land is used for agriculture. The remaining 5% has undergone residential development. Cow pastures and citrus groves are numerous in the upstream watershed, and have historically contributed to high nutrient and bacteria levels.

Results

The biological results were again excellent at this site. The February 1997 sampling yielded a Stream Condition Index score of 31, putting it in the "very good" category. There were 40 different macroinvertebrate taxa collected in the sample. Of these, 5 were from the sensitive "EPT" group (larval mayflies, stoneflies, and caddisflies). The site achieved a very good Florida Index score of 20. The Florida Index is based on the number of pollution-intolerant taxa present at the site. The most abundant macroinvertebrate collected was the amphipod *Hyaella azteca*, which represented 17% of the sample. In March 1999, the SCI score was again 31. On this sampling date, 46 taxa were found, 13 of which were EPT. The Florida Index score was 22. The dominant macroinvertebrate found in this bioassessment was the midge *Polypedilum flavum* (formerly *P. convictum* group), which accounted

for just over 20% of the sample. Nutrient and bacteria levels in Livingston Creek were consistent with what has been observed in previous years. Phosphorus and Kjeldahl nitrogen levels were in the low to medium range. However, nitrate/nitrite and total ammonia levels ranged from high to very high. Coliform bacteria levels were not measured in 1997, but samples taken in 1999 indicated very high levels of both fecal and total coliforms. Although neither represented a violation of water quality standards for a single sampling event, fecals were in the 90th percentile compared to other Florida streams (680 colonies/100 mL), and total coliforms were greater than the 80th percentile (1050 colonies/100 mL). Physicochemical measurements showed good results. Dissolved oxygen, pH, specific conductance, and water temperature were all within normal ranges, and consistent with historical data. Secchi depth (an indication of water clarity) was also normal for this site. On both occasions, the habitat assessment results were good. Ratings were very similar, with a score of 127 out of a possible 145 points (87.6%) in February 1997, and 137 out of 160 possible points (85.6%) in March 1999. Water velocity was good, and there was no artificial channelization of the stream. The riparian buffer zone was broad, and contained a diverse and mostly native plant community. There was some depression in habitat scores due to moderate erosion near the bridge and a scarcity of some instream habitat types. All parameters tested met the water quality standards outlined in Florida Administrative Code 62-302.530 for Class III waters.

Significance

The biological results suggest that Livingston Creek remains in good ecological health, despite some water quality problems. The good flow and habitat appear to support a diverse and abundant macroinvertebrate (as well as fish and macrophyte) community. The high nutrient and coliform bacteria levels are probably a result of upstream cattle and citrus activity in the watershed, as well as input from impacted Reedy Lake. Because Livingston Creek is a component of the Kissimmee River system (which is a part of the larger Lake Okeechobee/Everglades/Florida Bay system), its water quality is significant. In addition, that portion of the stream which is within Lake Arbuckle State Forest is considered Outstanding Florida Water according to Florida Administrative Code 62-302.700, and is thus supposed to be afforded the highest level of environmental protection. Livingston Creek is also important as a reference site, useful as a benchmark to compare with other streams in the area. Unfortunately, there are few other clean streams in this ecoregion.

Suggestions

Continued assessment of the ecological health of this stream is important to monitor any additional degradation of water quality, and for further refinement of bioassessment methodology. Suggestions for improvement of water quality would include limiting cattle access to Livingston Creek and enhancing stormwater systems used by lakeside communities and agricultural interests upstream.

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