STREAM ECOSUMMARY

Ginhouse Creek at Homard Road
February 29 and October 11, 2012

DEP conducted water quality and biological sampling at Ginouse Creek at Homard Boulevard in Duval County on February 29th and October 11th, 2012 to assess attainment of designated uses. Ginhouse Creek was listed as impaired for dissolved oxygen and fecal coliforms. Overall, the water quality and macroinvertebrate community data indicated that the stream met expectations for a healthy, well-balanced stream.

Background

Although healthy, well-balanced stream and river communities may be maintained with some level of human activity, such activities may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or pesticides from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of nuisance (generally exotic) plants and animals. DEP has methods to evaluate if human activities have resulted in the condition where a particular waterbody has exceeded water quality criteria (Chapter 62-302, Florida Administrative Code), including whether adverse impacts to biological communities have occurred. DEP water quality standards are designed to protect designated uses of the waters of the state (*e.g.,* recreation, aquatic life support), and exceedances of these standards is associated with interference with the designated use. The Stream Condition Index (SCI) assesses how closely the macroinvertebrate community (*e.g.,* aquatic insects, clams, and crayfish) of a stream resembles the macroinvertebrate community of an undisturbed or "reference" condition. The stream and river habitat assessment evaluates the availability and quality of habitat for macroinvertebrates, and can help diagnose the cause of a low SCI score.

Methods

This stream was sampled on February 29 and October 11, 2012 by biologists from the DEP Northeast District Office. Surface water samples were collected for analysis of nutrients, chlorophyll *a*, color, Biochemical Oxygen Demand 5-day, alkalinity, and turbidity following DEP Standard Operating Procedures (SOPs, see http://www.dep.state.fl.us/water/sas/sop/sops.htm for details). Sampling and analyses met FDEP quality assurance/ quality control standards (see http://www.dep.state.fl.us/water/sas/qa/index.htm) The Stream Condition Index (SCI) was sampled per DEP SOP FS7420 and calculated per DEP SOP LT7200 The SCI consists of collecting macroinvertebrates via 20 D-frame dipnet sweeps (0.5 m in length) in the most productive habitats in a 100 m reach of stream. The organisms are sub-sampled, and identified to the lowest practical taxonomic level. The SCI is composed of ten metrics, eight of which decrease in response to human disturbance, with two metrics (% very tolerant and % dominant) increasing in response to human disturbance. According to DEP SOP LT 7000, the SCI score ranges and categories are: (68-100) Exceptional; (35-67) Healthy; and (0-34) Impaired. Proposed biological health assessment criteria state that a site is considered to meet designated uses if the average of the two most recent SCI scores is 40 or higher and neither of those scores is less than 35. The Stream and River Habitat Assessment was conducted per DEP SOP FT 3100.

The Habitat Assessment is a rapid field method in which a sampler scores eight in-stream and riparian components to estimate the influence of habitat factors on the resident aquatic organisms. Habitat Assessment scores range from 11-160 and overall habitat quality is assigned to one of four categories: Optimal (120-160 points), Suboptimal (80-119 points), Marginal (40-79 points), and Poor (11-39 points).



Figure 1. Location of Ginhouse Creek SCI site in Duval County.

Site Information

Ginhouse Creek was sampled above Homard Boulevard (Figure 1). This location provided an intact riparian zone and canopy and favorable habitats (Figure 2). Ginhouse Creek was listed as impaired for fecal coliform and dissolved oxygen.

The predominant land use in this watershed is high density residential housing. Ginhouse Creek receives a large portion of its flow from untreated storm water runoff. The quality of this stormwater is improved by the intact wetlands above Homard Road. These wetlands help to attenuate the high flows during storm events and trap some of the sediments and nutrients carried in to the system by runoff from impervious surfaces.



Figure 2. Stream Condition Index site for Ginhouse Creek @ Homard Rd.on 02/29/2012 and 10/11/12.

Results

Water Quality

The water quality samples complied with water quality criteria (Table 1).

Table 1. Water quality results from 2/29/12 and 10/11/12 at Ginhouse Creek @ Homard Road.

Analyte	2/29/12 Result	10/11/12 Result	Remark	Applicable Class III Water Quality Criteria
Field Temperature (°C)	19.2	22.6		
Field pH (SU)	7.11	7.14		
Field Dissolved Oxygen (mg/L)	6.02	5.9		≥5.0
Field Specific Conductance (µmhos/cm)	474	392		1,275
Alkalinity (mg $CaCO_3$/L)	123	106		Shall not be depressed to <20
Color (PCU)	80	85		
Chlorophyll a (µg/L)	1.1	0.83		
Total	0.13	0.079		*≤ 0.12

Phosphorus (mg/L)				
Nitrate+Nitrite (mg/L)	0.16	0.44		
Ammonia (mg/L)	0.059	0.043		
Total Kejldahl Nitrogen (mg/L)	0.52	0.44		
Total Nitrogen (mg/L)	0.68	0.92		*≤ 1.54

* State adopted nutrient thresholds, used in conjunction with biological information, for Peninsula nutrient region

Habitat Assessment

The stream and river habitat assessment scores were 114 and 122 on February 29 and October 11, 2012, respectively, placing the site in the "Suboptimal" range. Habitats present were roots, snags and submerged aquatic vegetation. There was some habitat smothering by sand and silt.

Stream Condition Index

The SCI scores for this site were 51 (2/29/2012) and 46 (10/11/2012) out of a possible 100 points, both corresponding with a "Healthy" designation. The biological community present in this stream was well balanced and included a mixture of sensitive and tolerant taxa.

Periphyton

The attached algal community in the stream consisted of cyanobacteria (blue-green algae), green algae and diatoms. Presence of algae (typically diatoms) is expected in a fully functioning stream, but an over abundance of algae (especially filamentous algae) may reduce habitat quality (from smothering) and lead to excess organic matter production (and decomposition), which can harm fish and invertebrates. Problematic algal growth was not observed in Ginhouse Creek.

The intact wetlands above Homard Road in the Ginhouse Creek watershed help attenuate the high flows during storm events and trap some of the sediments and nutrients carried in to the system by runoff from impervious surfaces, allowing this system to maintain a "healthy" designation even with moderate amounts of development

Thank you for your interest in maintaining the water quality of Florida's streams and rivers. Please feel free to contact us if you have any questions.

Contact and resources for more information:

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DEP biological assessment resources:

http://www.dep.state.fl.us/water/bioassess/index.htm