

# Hollin Creek

Anclore Watershed

Pinellas County

WBID 1475

February 1, 2011



## Purpose

Two biological assessments were performed on Hollin Creek on February 1, 2011, in order to gain further information on the biological health of the watershed as part of Florida's Watershed Assessment and TMDL programs.

The assessment method used, the Stream Condition Index (SCI), was developed by the Florida Department of Environmental Protection (FDEP) to determine the ecological integrity of aquatic macroinvertebrate communities, which in turn reflects the general health of the stream (Fore et. al., 2007). The SCI is based on ten measurements of the aquatic macroinvertebrate community structure, eight of which decrease in response to human disturbance and two metrics (% very tolerant and % dominant) that increase with greater human disturbance. As described in DEP SOP LT 7000, the SCI score ranges and categories are: (68-100) Exceptional; (35-67) Healthy; and (0-34) Impaired. As part of numeric nutrient criteria development, EPA considered an SCI score of 40 or higher to fully meet the expectation of a healthy, well- balanced community. Each SCI includes assessment of stream habitat, conducted per DEP SOP FT 3100.

A full evaluation requires two temporally independent bioassessments. In order to be considered impaired, a site must have two consecutive failing SCI scores.

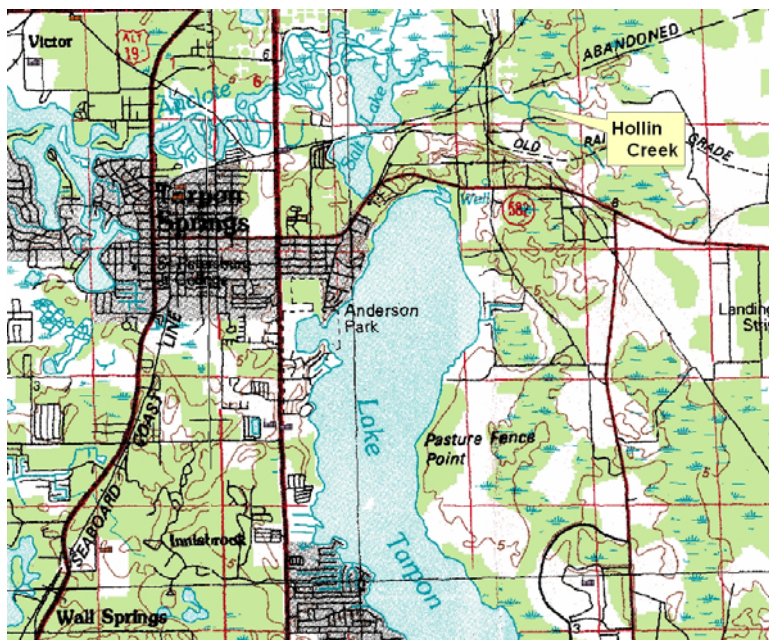


Figure 1. Geographic location of Hollin Creek.

## Watershed Characteristics

Hollin Creek is a second order stream in northern Pinellas County that flows in a westerly direction into Salt Lake, located within the Anclote River basin (Fig.1). The Creek drains a cypress swamp and flows through a golf course community prior to emptying into the Anclote estuary.



Figure 2. Location of sites in Hollin Creek

## Results

Two sites in Hollin Creek were sampled on 2/01/11 (Figure 2). At the downstream site (TP11022S, Figure 3), the creek is a second order, sandy bottom stream with a water velocity of 0.33 m/sec. The in-stream habitat in Hollin Creek at this location was predominantly sandy bottom with 8% substrate available for invertebrate and fish use (snags, roots, and leaves). The Habitat Assessment (HA) score was 117, which is on the high end of the suboptimal habitat category. Despite the adjacent residential development, the Creek has not been channelized and exhibited natural morphology. The wooded riparian zone was fairly thick on the right bank but sparse on the left bank, where the golf course came within 10 meters of the stream. The riparian zone provides a buffer from storm water runoff inputs, and serves as a source of food and physical substrates for fish and invertebrates. The SCI score at site TP11022S was 41 (out of 100 possible points), meeting the minimum criteria for a healthy, and well balanced macroinvertebrate community.





**Figure 3. TP11022S**

The Creek at site TP220, further upstream, is a first order stream flowing through a cypress flood plain (Figure 4). This site was also predominately sandy bottomed with 10% available habitat (snags, roots and leaves). The HA score was 126, which falls in the low end of optimal conditions. Water velocity was 0.3 m/sec. The riparian zone was natural and wide enough on both sides to provide adequate protection from storm water runoff. At TP220, the SCI score was only 26, indicating disturbance to the macroinvertebrate community. However, at this location the creek is a first order headwater stream that is likely to go dry seasonally. We could not be sure that the creek had been flowing for a minimum of three months prior to sampling, allowing for adequate colonization by macroinvertebrates (and as specified in our Standard Operating Procedures (SOP) and the resulting low SCI score may not be accurately assessing the macroinvertebrate community.



**Figure 4. TP 220**

There were only two sensitive species at TP11022S and one at TP220. Neither site had any long lived species, although mussels were observed at TP220, but not present in the analysis. TP11022S was dominated by the midge, *Rheotanytarsus* sp. and TP220 was dominated by *Hyaella azteca*, an amphipod grazer. During the course of rinsing leaves out of the sample at TP11022S, an unusual oil slick was observed (Figure 5), accompanied by the odor of gasoline.



Figure 5. Oil slick at TP11022S

Physicochemical results are shown in Table 1. Dissolved oxygen (DO) was above the State Standard of a minimum of 5 mg/l at both sites. Conductivity was slightly elevated, possibly due to storm water runoff from area development.

Site	Time	Temperature (deg. C)	Conductivity (umho/cm)	Dissolved Oxygen (mg/l)	pH (SU)	Clarity	Water velocity (m/s)
TP11022S	1150	15.74	349	5.95	6.97	Clear and tannic	0.28
TP220	1330	16.51	344	5.18	6.83	Clear	0.33

Table 1. Physicochemical measurements.

## **Significance**

Biological sampling in Hollins Creek was inconclusive. While the SCI score at TP11022S exceeded the minimum criteria for a health macroinvertebrate community, the petroleum product observed suggests that some undesirable practices in the watershed need to be addressed. At TP220, in the headwater tributary, the macroinvertebrate community may have been stressed by periods of desiccation prior to the sampling event. Consequently, the stream will be sampled again in the fall of 2011, after the rainy season, to ensure that over three months of continuous flow has occurred prior to sampling. This should eliminate natural desiccation as a stressor, and allow conclusions to be drawn concerning the effects of water quality on the stream biota.

## **Suggestions**

It was evident that the golf course had several Best Management Practices (BMPs) in place, including minimum use of fertilizers and maintenance of stream riparian zone. However, the stream may be receiving contaminated runoff from residential development, particularly in view of the oil slick observed in TP11022S. Rain and household water mixed with urban pollutants may result in storm water with undesirable quality entering the stream. These potential pollutants may include: oil, and other automobile fluids, paint and construction debris, yard and pet wastes, pesticides and litter. Untreated urban runoff may contaminate streams, rivers and bays, and also may harm aquatic life. Pinellas County, the golf course and local municipalities have BMPs in place in some areas, but practices on private property could be improved. Home owners can reduce storm water runoff pollution by limiting lawn fertilization and removing yard and automotive waste and so that it does not enter the stream with the storm water runoff.

## **References**

Stream Condition Index (SCI) Report - Fore, L. et al. 2007. Development and Testing of Biomonitoring Tools for Macroinvertebrates in Florida Streams.

[http://publicfiles.dep.state.fl.us/dear/sas/sopdoc/sci\\_final.pdf](http://publicfiles.dep.state.fl.us/dear/sas/sopdoc/sci_final.pdf)

DEP-SOP-002/01 LT 7000 Determination of Biological Indices, 12/03/08

<http://publicfiles.dep.state.fl.us/dear/sas/sopdoc/2008sops/lt7000.pdf>

DEP-SOP-001/01 FT 3000 Aquatic Habitat Characterization

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