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NEWS & EVENTS ...

Stage 1 Water Restrictions Are Still in Place!

Customers are urged to reduce water usage by at least 10 percent

Visit Us Online at www.ci.hillsborough.nc.us for More Details.

This is a publication of the ...

Town of Hillsborough
Public Works Department
Stormwater Program

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Our Stormwater Drains to the Eno River!

Group Begins Stream Monitoring

Local Boy Scout Troop 438 has begun quarterly monitoring of Stillhouse Creek. Stillhouse Creek recently was restored (see previous article in Volume 1, Number 2 of the *Stormwater Almanac*) to help eliminate erosion concerns and improve water quality.

The monitoring consists of four parts: trash cleanup, visual health, invasive plant species and water quality.

The scouts collect and appropriately dispose of trash occurring in and along the creek. Keeping trash out of the stream is the first step to improving water quality. Trash in the stream can leach harmful chemicals into the creek as it decomposes. Trash is bad for wildlife that depends on the stream. They may mistake it for food or become entangled in it.

The scouts visually monitor the health of the stream and conservation easement adjacent to the stream. This area, also called a riparian zone or stream buffer, helps absorb pollutants found in stormwater runoff. Scouts look for signs of pollution and healthy vegetation and note animal species observed. Species diversity is an indicator of buffer health.

While assessing the buffer, scouts look for invasive plants, non-native species that can "take over" an area. Invasive species reduce diversity and lower overall stream health. The primary plant species of concern is *common privet*, a woody shrub. Scouts remove the plant by cutting or pulling it out of the ground.

Water quality of the stream is determined by conducting two types of samples: chemical and biological. Water samples are collected and analyzed for chemical properties



Eagle Scout David Damin describes the stream monitoring project to fellow scouts.

using a simple field test kit. Parameters collected include temperature, pH, dissolved oxygen and nutrient levels.

Stream temperature affects chemical and biological processes in the stream, including how much oxygen is available to aquatic organisms. Temperature fluctuates seasonally.

A pH test measures the alkalinity or acidity concentration in water. A pH of 7 is neutral, below 7 is acidic, and above 7 is basic or alkaline. Pollution can change pH levels, and levels that are too high or too low are harmful to aquatic organisms. The pH level of the stream should range between 6 and 9.

Dissolved oxygen measures the amount of oxygen in the water. Dissolved oxygen is used by aquatic plants and other organisms including fish. Pollution can lower dissolved

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Are YOU Interested in Monitoring a Local Stream?
If you or your group is interested in adopting a stream in the Hillsborough area, please contact Terry Hackett, Water Resource Officer with Orange County Erosion Control at telephone number 245-2588 or email thackett@co.orange.nc.us.

Stillhouse Creek Monitoring Results

As they become available, monitoring results for Stillhouse Creek will be posted in the Stormwater Almanac and/or on the Town of Hillsborough's stormwater Web site. Initial monitoring took place Sept. 15, 2007. Detailed results are provided below. Overall the health of Stillhouse Creek and its riparian buffer area is good. The next monitoring event at Stillhouse Creek was scheduled for this month.



Water Resource Officer Terry Hackett and scouts Adam Reynolds and Jonathan Brown identify aquatic insects.

Trash Clean-up

Number of Bags 5
Weight 50 lbs.

Trash consisted mostly of paper and bottles; one tire was removed.

Stream & Buffer Health

Vegetative Cover 70 to 100%
Tree Canopy Good
Ground Cover Good
Stream Banks Stable
No Erosion

Four planted trees will need to be replaced

Invasive Species

About 15 to 20 common privet plants were manually removed during the initial monitoring.

Water Quality

Chemical Parameters

Site	Temp. °F	pH	P mg/l	N mg/l	DO
1	73.4	6.1	BDL*	BDL	14 mg/l
2	69.8	6.4	BDL*	BDL	11.5 mg/l
3	73.4	6.4	BDL*	BDL	9 mg/l
4	70.7	6.9	BDL*	BDL	10.5 mg/l

P – Phosphorous; DO – Dissolved Oxygen
N – Nitrogen; BDL – Below Detection Limits

Benthic Macro-invertebrate Index

Sampling Location	Excellent (>22)	Good (17-22)	Fair (11-16)	Poor (<11)
Site 1		17		
Site 2			14	
Site 3		17		
Site 4				10



Assistant Scoutmaster David Reynolds and scouts David Brown and Adam Hackett install a sign.



Scouts James Flowers and Matthew Stafford, along with Assistant Scoutmaster Jim Flowers, conduct chemical sampling.

oxygen and cause fish kills. For aquatic life, dissolved oxygen should be above 5 milligrams per liter (mg/l).

Nitrogen and phosphorous are naturally occurring nutrients but in high levels can be harmful to aquatic organisms. High levels of nutrients cause too much algae. As algae grow and die, they use large amounts of dissolved oxygen. If dissolved oxygen levels drop, aquatic organisms (including fish) can die. Nutrients often increase in urban stormwater runoff.

The biological sample type includes collecting *benthic macro-invertebrates*. Benthic macro-invertebrates primarily include aquatic insects, but other animals such as mollusks, crustaceans and fish also are noted. Aquatic insects and other benthic animals are great indicators of stream health. Many aquatic insects do not tolerate pollution while others do. For instance, black fly larvae can survive in polluted waters while most mayfly larvae will not. Knowing which organisms occur in the stream gives an indication of stream health. Special sampling nets are used to collect the aquatic animals. The animals are counted to determine an index.

Both the benthic and the water quality samples are taken at four stations along the stream. Stations are located at each of the three "foot" bridges. Another is just downstream of Margaret Lane.

The baseline monitoring event—including organizing the training, planning the work days and other aspects of the stream watch—were part of an Eagle Scout project completed by David Damin. Now that the baseline is complete, subsequent monitoring will be conducted by Troop 438 on roughly a quarterly basis. Results will be posted on the town's stormwater website, initial results are provided in this newsletter.

For more information, contact:



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