STREAM ECOSUMMARY

Etoniah Creek at North Creek Road
February 1, 2012 & September 25, 2012

DEP conducted water quality and biological sampling at Etoniah Creek at North Creek Road in Putnam County on February 1 and September 25, 2012, to assess attainment of designated uses. This site was sampled for the Strategic Monitoring as part of the Watershed Assessment program. 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 water body 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 water body 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 2/1/2012 and 9/25/2012 by the DEP Northeast District Office. Surface water samples were collected for analysis of nutrients, chlorophyll a, color, and alkalinity following DEP Standard Operating Procedures (SOPs, http://www.dep.state.fl.us/water/sas/sop/sops.htm for details). Sampling and analyses met FDEP quality assurance/ quality control standards (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 dip net 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).

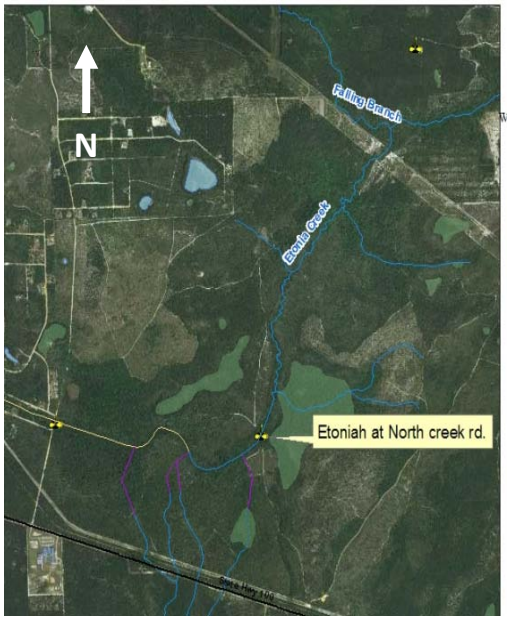


Figure 1. Location of Etoniah Creek at North Creek Road in Putnam County.

Site Information

Etoniah Creek at North Creek Road is in the Etoniah Creek State Forest (Figure 1). The North Creek Road site is in the upstream portion of the waterbody segment (WBID). Etoniah Creek flows east to Rice Creek which drains into the St. Johns River. The surrounding land use is natural forest preserved for recreational use. The creek was historically channelized for better drainage in the state forest (Figure 2). Vegetation buffer around the stream is very good. Etoniah Creek at North Creek Road landscape development intensity index is 2.5 which indicates that it has a small amount of human development in the surrounding landscape.



Figure 2. Stream Condition Index site for Etoniah Creek at North Creek Road on 9/25/2012

Results

Water Quality

The water quality samples complied with water quality criteria (Table 1). The dissolved oxygen met state standards. There was an increase in several parameters in the September sampling as compared to the February sampling. The increase in color indicates increased runoff from the surrounding forests which are rich in tannins and other organic material. The nitrogen level in the September sample was elevated, likely due to the increased plant growth and organic breakdown of detritus. The increase in the conductance and alkalinity would likely be a result of increased rainfall and storm water drainage. The rainfall amounts for the Etoniah Creek Road gauge indicates less than half an inch for January, whereas September had over five inches of rain.

Table 1. Water quality results from 02/01/2012 and 09/25/2012 at Etoniah Creek at North Creek Road.

Analyte	Result 2/1/2012	Result 9/25/2012	Remark	Applicable Class III Water Quality Criteria
Field Temperature (°C)	14.7	21.8		
Field pH (SU)	6.05	6.46		
Field Dissolved Oxygen (mg/L)	7.3	5.8		≥5.00
Field Specific Conductance (µmhos/cm)	85	217		≤1275 or 50% above background
Alkalinity (mg $CaCO_3$/L)	22	43		
Color (PCU)	26	180		
Chlorophyll a (µg/L)	0.78	U 0.55	U=Non detect	
Total Phosphorus (mg/L)	0.21	0.16		≤ 0.12 *
Nitrate+Nitrite (mg/L)	0.056	0.64		
Ammonia (mg/L)	0.019	0.017		
Total Kejldahl Nitrogen (mg/L)	0.29	1.5		
Total Nitrogen (mg/L)	0.35	1.517		≤ 1.54 *

* Federally promulgated numeric nutrient criteria for [Peninsula] nutrient region

Habitat Assessment

The stream and river habitat assessment score was 96 on 2/1/12 and 126 on 9/25/12, which is in the optimal to sub-optimal range. The habitat score increased between sampling events largely due to a significant increase in the amount of macrophyte habitat. In addition, water velocity was twice as high during the second sampling as for the first. The periphyton growth was minimal in both samplings.

Stream Condition Index

The SCI score for this site was 76 in Februaryand 85 in September, out of a possible 100 points, corresponding with two “Exceptional" designations. The exceptional SCI score reflects a healthy well balanced macro invertebrate community. The initial sample was dominated by the midge, *Tanytarsus*, and gastropod, *Ancylidae*. The second sample was dominated by the Amphipod, *Hyalella*, and Midge *Polypedilum*. The first sampling had eight sensitive species, while the later sampling had nine. The first sampling had nine to twelve percent very tolerant species, while the later sampling had one to two percent of very tolerant. The high amounts of sensitive species as compared to low numbers of tolerant species indicate good water quality. The two sampling events indicated good biological integrity.

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