

2015 Monitoring Summary



Use Support Assessment

Unnamed Tributary to Chewacla Creek at Wrights Mill Road in Lee County (32.58639/-85.47243)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the unnamed tributary to Chewacla Creek, also known as Town Creek, was monitored in 2015 to provide biological, chemical, and physical data to fully assess the use support status of the reach. The stream enters Chewacla Creek between Moores Mill Creek and Parkerson Creek. Both are on the 303(d) list of impaired waters. Parkerson Creek is listed for pathogens for urban runoff/storm sewers. Moores Mill Creek is listed for siltation (habitat alteration) from land development and urban runoff/storm sewers.



Figure 1. Unnamed tributary to Chewacla Creek at UTCL-1, April 8, 2015.

Table 1. Summary of watershed characteristics.

Watershed Characteristics			
Basin	Tallapoosa River		
Drainage Area (mi²)	2		
Ecoregion^a	45B		
Landuse^b			
Forest	Deciduous		2%
	Evergreen		<1%
	Mixed		1%
Shrub/scrub			<1%
Development	Open space		43%
	Low intensity		28%
	Moderate intensity		15%
	High intensity		9%
Population/km^{2c}	1278		
# NPDES Permits^d	TOTAL	1	
Construction		1	

a. Southern Outer Piedmont

b. 2011 National Land Cover Dataset

c. 2010 US Census

d. #NPDES outfalls downloaded from ADEM's NPDES Management System database, April 1, 2016.

Table 2. Physical characteristics of unnamed tributary to Chewacla Creek at UTCL-1, May 18, 2015.

Physical Characteristics		
Width (ft)	20	
Canopy Cover	Estimate 50/50	
Depth (ft)		
	Run	1.0
	Pool	1.5
% of Reach		
	Run	70
	Pool	30
% Substrate		
	Bedrock	5
	Cobble	5
	Gravel	2
	Sand	71
	Silt	12
	Organic Matter	5

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Town Creek at UTCL-1 is a *Fish and Wildlife (F&W)* stream. Located on the Auburn University campus, landuse is highly urbanized and densely populated. As of April 1, 2016, there was one active construction outfall within this watershed.

REACH CHARACTERISTICS

General observations (Table 2) and a habitat assessment (Table 3) were completed during the macroinvertebrate assessment. In comparison with reference reaches in the same ecoregion, they give an indication of the physical condition of the site and the quality and availability of habitat. The unnamed tributary to Chewacla Creek at UTCL-1 is a glide-pool stream located in the Southern Outer Piedmont ecoregion (45b) (Figure 1). Benthic substrate in the reach consists primarily of sand with some silt. Overall habitat quality was rated as *marginal* for supporting macroinvertebrate communities.

Table 3. Results of the habitat assessment conducted on unnamed tributary to Chewacla Creek at UTCL-1, May 18, 2015

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	36	Marginal (31-<55)
Sediment Deposition	43	Marginal (31-<55)
Sinuosity	43	Marginal (31-<55)
Bank Vegetative Stability	25	Poor (<31)
Riparian Buffer	24	Poor (<31)
Habitat Assessment Score	58	
% of Maximum Score	34	Marginal (31-<57)

Table 4. Results of the macroinvertebrate bioassessment conducted in unnamed tributary to Chewacla Creek at UTCL-1, May 18, 2015.

Macroinvertebrate Assessment		
	Results	Scores (0-100)
Taxa richness and diversity measures		
# EPT taxa	0	0
Shannon Diversity	3.07	17
Taxonomic composition measures		
% EPT minus Baetidae and Hydropsychidae	0	0
% Non-insect taxa	12	55
Tolerance measures		
% Tolerant taxa	50	0
WMB-I Assessment Score	---	14
WMB-I Assessment Rating		Very Poor (0-22)

BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). The WMB-I uses measures of taxonomic richness, community composition, and community tolerance to assess the overall health of the macroinvertebrate community. Each metric is scored on a 100 point scale. The final score is the average of all individual metric scores. The metric results indicated the macroinvertebrate community to be in *very poor* condition due to a high percentage of nutrient tolerant organisms and a lack of sensitive individuals in the reach (Table 4).

WATER CHEMISTRY

Results of water chemistry analyses are summarized in Table 5. In situ measurements and water samples were collected March through October 2015 to help identify any stressors to the biological communities. No organics were collected. Median concentrations of total dissolved solids, specific conductance, alkalinity, ammonia nitrogen, nitrate+nitrite nitrogen, total kjeldahl nitrogen, and chlorides were higher than expected based on reference reach data for streams located in Piedmont ecoregion (45). The Southern Outer Piedmont ecoregion (45b) is a level IV ecoregion located within the level III Piedmont ecoregion (45).

SUMMARY

Overall habitat quality was categorized as *marginal* for supporting biological communities. Bioassessment results indicated the macroinvertebrate community in the unnamed tributary of Chewacla Creek, also known as Town Creek at UTCL-1 to be in *very poor* condition. Median concentrations of total dissolved solids, specific conductance, alkalinity, ammonia nitrogen, nitrate+nitrite nitrogen, total kjeldahl nitrogen, and chlorides were higher than expected based on reference reach data for streams located in ecoregion 45. The *very poor* macroinvertebrate score could be due to the elevated nutrients in the creek. Monitoring should continue to ensure water quality and biological conditions meet current standards.

Table 5. Summary of water quality data collected March-October, 2015. Minimum (Min) and maximum (Max) values calculated using minimum detection limits (MDL) when results were less than this value. Median, average (Avg), and standard deviations (SD) values were calculated by multiplying the MDL by 0.5 when results were less than this value.

Parameter	N	Min	Max	Med	Avg	SD
Physical						
Temperature (°C)	9	14.0	25.8	23.8	21.6	4.0
Turbidity (NTU)	9	2.3	21.1	3.4	6.9	6.2
Total Dissolved Solids (mg/L)	8	54.0	101.0	84.0 ^M	80.6	13.6
Total Suspended Solids (mg/L)	8	< 1.0	9.0	4.5	4.4	3.5
Specific Conductance (µmhos/cm@25C)	9	81.0	149.4	133.8 ^G	129.4	20.9
Alkalinity (mg/L)	8	32.5	54.8	50.0 ^M	48.6	7.2
Monthly Stream Flow (cfs)	8	0.4	2.2	1.1	1.1	0.6
Stream Flow during Sample Collection (cfs)	8	0.4	2.2	1.1	1.1	0.6
Chemical						
Dissolved Oxygen (mg/L)	9	7.0	10.2	8.1	8.1	1.0
pH (SU)	9	7.1	7.4	7.1	7.2	0.1
^J Ammonia Nitrogen (mg/L)	8	< 0.007	0.036	0.005 ^M	0.010	0.011
Nitrate+Nitrite Nitrogen (mg/L)	8	0.224	0.565	0.516 ^M	0.474	0.117
^J Total Kjeldahl Nitrogen (mg/L)	8	< 0.064	1.040	0.362 ^M	0.403	0.335
^J Total Nitrogen (mg/L)	8	< 0.574	1.264	0.850	0.877	0.259
^J Dissolved Reactive Phosphorus (mg/L)	8	0.003	0.015	0.007	0.008	0.004
Total Phosphorus (mg/L)	8	0.015	0.040	0.020	0.023	0.009
CBOD-5 (mg/L)	8	< 2.0	< 2.0	1.0	1.0	0.0
Chlorides (mg/L)	8	2.4	9.1	7.4 ^M	6.9	2.1
Biological						
Chlorophyll a (mg/m ³)	8	< 0.10	6.41	0.50	1.38	2.08

G=value higher than median concentration of all verified ecoregional reference data collected in the ecoregion 45; J=estimate; M=value >90% of all verified ecoregional reference reach data collected in the ecoregion 45; N=# samples

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