Alabama Department of Environmental Management

Ecological Reference Reach

Rivers and Streams Monitoring Program

2012 Monitoring Summary

Good

Walton Creek at Bibb County Road 51 (32.83971/-87.18488)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) monitored Walton Creek as a Candidate Reference Reach. Reference reaches represent best-attainable conditions and provide background data used for comparison with other streams in the same ecoregion. Additionally, ADEM included the Walton Creek watershed for biological and water quality monitoring as part of the 2012 Assessment of the Black Warrior and Cahaba (BWC) River Basins. The objectives of the BWC Basin Assessments were to assess the biological integrity of each monitoring site and to estimate overall water quality within the BWC basin group.

Figure 1. Walton Creek at WLTB-1, April 25, 2012.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Cahaba River
Drainage Area (mi^2)		11
Ecoregion[a]		65i
% Landuse		
Open water		<1
Wetland	Woody	2
Forest	Deciduous	25
	Evergreen	38
	Mixed	16
Shrub/scrub		13
Grassland/herbaceous		1
Pasture/hay		3
Cultivated crops		<1
Development	Open space	3
Population/km^2[b]		2

a.Fall Line Hills

b.2000 US Census

Table 2. Physical characteristics of Walton Creek at WLTB-1, April 25, 2012.

Physical Characteristics		
Width (ft)		15
Canopy Cover		Mostly Shaded
Depth (ft)		
	Riffle	0.5
	Run	1.0
	Pool	2.5
% of Reach		
	Riffle	15
	Run	60
	Pool	25
% Substrate		
	Gravel	40
	Sand	38
	Silt	2
	Organic Matter	20

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Walton Creek is a *Fish & Wildlife (F&W)* stream in Talladega National Forest in south-central Bibb County. It runs roughly west to east along the Bibb/Perry County Line toward the receiving waters of the Cahaba river. Based on the 2006 National Land Cover Dataset, land use within the watershed is primarily forest (79%) with some shrub/scrub. As of September 4, 2012, ADEM has issued no NPDES permits in the 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. Walton Creek at WLTB-1 is a low-gradient, riffle-run stream. Predominant instream substrates were gravel and sand (Figure 1). The overall habitat assessment resulted in a *sub-optimal* rating due to poor bank and vegetative stability. Flow was impeded by rip-rap dam just downstream of bridge, causing pooling and accumulation of fine sediments.

BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). Table 4 summarizes results of taxonomic richness, community composition, and community tolerance metrics. Each metric is scored on a 100 point scale. The final score is the average of all individual metric scores. Metric results indicated the macroinvertebrate community in Walton Creek at WLTB-1 to be in *good* condition.

Table 3. Results of the habitat assessment conducted in Walton Creek at WLTB-1, April 25, 2012.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	57	Sub-optimal (53-65)
Sediment Deposition	61	Sub-optimal (53-65)
Sinuosity	80	Sub-optimal (65-84)
Bank and Vegetative Stability	23	Poor <35
Riparian Buffer	89	Sub-optimal (70-89)
Habitat Assessment Score	**144**	
% Maximum Score	**60**	**Sub-optimal (53-65)**

Table 4. Results of the macroinvertebrate bioassessment conducted in Walton Creek at WLTB-1, April 25, 2012.

Macroinvertebrate Assessment		
	Results	**Scores**
Taxa richness and diversity measures		**(0-100)**
% EPC taxa	40	84
% Dominant Taxon	39	22
Taxonomic composition measures		
% EPT minus Baetidae and Hydropsychidae	22	40
Functional feeding group		
# Collector Taxa	23	80
Community tolerance		
% Nutrient Tolerant individuals	45	35
WMB-I Assessment Score	**---**	**52**
WMB-I Assessment Rating		**Good (48-74)**

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected April through November 2012 to help identify any stressors to the biological communities. In situ parameters were also measured during the macroinvertebrate assessment on April 25. Walton Creek did not meet *F&W* use classification criteria for the following parameters: dissolved oxygen on May 31st; pH on September 4th and November 7th; pathogens (E. coli) on June 12th, August 7th, and September 4th. On September 4th, at flood conditions, turbidity was greater than 50NTU above the 90th percentile of all verified reference reaches in ecoregion 65i. Median hardness was higher than expected for streams in the Fall Line Hills ecoregion. No organics samples were collected.

SUMMARY

Walton Creek at WLTB-1 is typical of other streams in the Fall Line Hills ecoregion. Generally, they are low-gradient and sandy-bottomed streams. Overall habitat quality was rated *sub-optimal*. Sediment loads are high during rain events and streambanks are being eroded, potentially impacting macroinvertebrate populations. Overall, pH was slightly acidic. E. coli counts were higher than *F&W* criteria in 3 of 8 sampling events.

Bioassessment results indicated the macroinvertebrate communities to be in *good* condition. Monitoring should continue to ensure that water quality and biological conditions meet current standards.

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Table 5. Summary of water quality data collected between April and November 2012. 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	E
Physical							
Temperature (°C)	9	11.9	24.3	21.6	19.3	4.8	
J Turbidity (NTU)	9	11.7	1272.0 T	16.6	159.0	417.5	
J Total Dissolved Solids (mg/L)	8	24.0	58.0	36.0	39.0	11.9	
J Total Suspended Solids (mg/L)	8	< 1.0	791.0	4.0	103.7	277.8	
Specific Conductance (µmhos)	9	14.8	39.3	24.5	25.2	7.6	
Hardness (mg/L)	4	5.0	9.3	7.0 G	7.1	2.1	
J Alkalinity (mg/L)	8	< 0.8	13.8	6.7	6.7	4.3	
Stream Flow (cfs)	7	1.2	10.2	3.4	4.3	3.2	
Chemical							
Dissolved Oxygen (mg/L)	9	4.8 C	9.3	7.5	7.4	1.6	1
pH (su)	9	5.0 C	6.3	6.2	6.0	0.4	2
J Ammonia Nitrogen (mg/L)	8	< 0.008	0.039	0.010	0.013	0.012	
J Nitrate+Nitrite Nitrogen (mg/L)	8	< 0.005	0.056	0.010	0.017	0.017	
Total Kjeldahl Nitrogen (mg/L)	8	< 0.041	0.468	0.328	0.302	0.160	
J Total Nitrogen (mg/L)	8	< 0.023	0.488	0.342	0.319	0.168	
J Dissolved Reactive Phosphorus (mg/L)	8	0.004	0.006	0.003	0.004	0.001	
J Total Phosphorus (mg/L)	8	0.009	0.087	0.014	0.027	0.027	
J CBOD-5 (mg/L)	8	< 2.0	< 2.0	1.0	1.0	0.0	
COD (mg/L)	1				22.0		
Chlorides (mg/L)	8	0.8	2.6	2.1	2.0	0.6	
Total Metals							
J Aluminum (mg/L)	4	0.176	0.468	0.246	0.284	0.128	
Iron (mg/L)	4	2.650	5.020	3.350	3.592	1.015	
Manganese (mg/L)	4	0.157	0.298	0.206	0.216	0.063	
Dissolved Metals							
Aluminum (mg/L)	4	< 0.043	< 0.043	0.022	0.022	0.000	
Antimony (µg/L)	4	< 3.6	< 3.6	1.8	1.8	0.0	
Arsenic (µg/L)	4	< 1.8	< 1.8	0.9	0.9	0.0	
Cadmium (µg/L)	4	< 0.022	< 0.046	0.017	0.017	0.007	
Chromium (mg/L)	4	< 0.009	< 0.009	0.004	0.004	0.000	
Copper (mg/L)	4	< 0.020	< 0.020	0.010	0.010	0.000	
Iron (mg/L)	4	0.244	0.315	0.272	0.276	0.031	
Lead (µg/L)	4	< 0.9	< 0.9	0.4	0.4	0.0	
Manganese (mg/L)	4	0.144	0.280	0.184	0.198	0.060	
Mercury (µg/L)	4	< 0.035	< 0.035	0.018	0.018	0.000	
Nickel (mg/L)	4	< 0.042	< 0.042	0.021	0.021	0.000	
Selenium (µg/L)	4	< 2.5	< 2.5	1.2	1.2	0.0	
Silver (µg/L)	4	< 0.015	< 0.215	0.058	0.058	0.058	
Thallium (µg/L)	4	< 1.4	< 1.4	0.7	0.7	0.0	
Zinc (mg/L)	4	< 0.012	< 0.012	0.006	0.006	0.000	
Biological							
Chlorophyll a (ug/L)	8	< 0.10	5.34	0.98	1.29	1.75	
J E. coli (col/100mL)	8	222	>2599 H	487	954	968	

C=*F&W* use classification criterion exceeded; E= #samples that exceeded criteria; G=value greater than median concentration of all verified reference data collected in ecoregion 65i; H=*F&W* human health criterion exceeded; J=estimate; N=# of samples; T=value >50 NTU above the 90th percentile of all verified reference data collected in ecoregion 65i.