Alabama Department of Environmental Management

Use Support Assessment

Rivers and Streams Monitoring Program

2013 Monitoring Summary

Poor

Weewoka Creek at Talladega County Road 139 (33.29050/-86.24700)

BACKGROUND

The Alabama Department of Environmental Management (ADEM), in consultation with the Environmental Protection Agency (EPA)- Region 4, identified Weewoka Creek at WWOT-37 as having insufficient data and information to make a final use support determination for Alabama's 2012 Integrated Water Quality Report. Refinements to the macroinvertebrate index used to assess the communities were necessary to more accurately characterize the macroinvertebrate communities in ecroregion 67f. Additional biological, chemical, and physical data were collected in 2013 for use in refining the index and fully assessing the use support status of Weewoka Creek for the 2014 Integrated Water Quality Report.

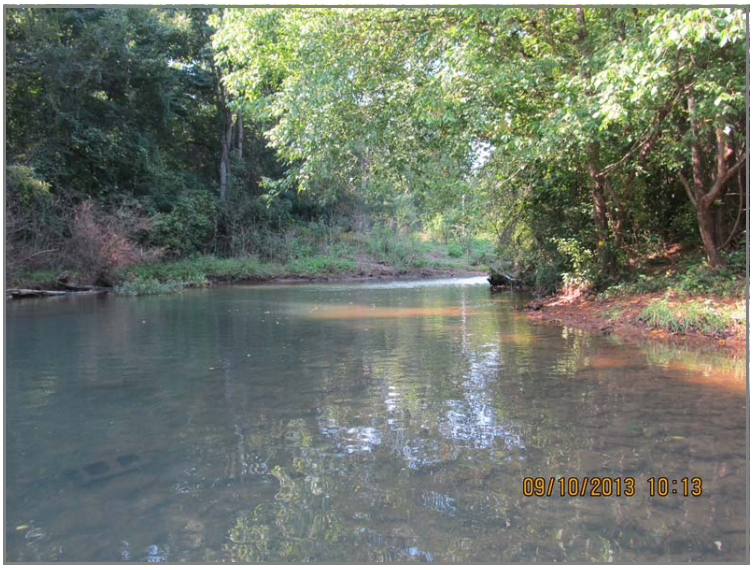

Figure 1. Weewoka Creek at WWOT-37, September 10, 2013.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Weewoka Creek at WWOT-37 is a *Fish and Wildlife (F&W)* stream located in Talladega County west of the town of Childersburg, Alabama. Based on the 2006 National Land Cover Dataset, landuse within the watershed is primarily forest (59%) with some cultivated crops and pasture/hay areas. Ten NPDES permits have been issued to the Weewoka Creek watershed as of May 13, 2013.

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. Weewoka Creek at WWOT-37 is characterized primarily by cobble and gravel substrates with some sand and silt present (Figure 1). Overall habitat quality was categorized as *sub-optimal* for this stream type due to a marginal riparian buffer and sedimentation issues.

TM Graphics provided by Florida Dept. of Environmental Protection (FDEP); used with permission

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Coosa River
Drainage Area (mi^2)		34
Ecoregion[a]		67f
% Landuse		
Open water		<1
Wetland	Woody	2
Forest	Deciduous	36
	Evergreen	20
	Mixed	3
Shrub/scrub		1
Grassland/herbaceous		7
Pasture/hay		12
Cultivated crops		12
Development	Open space	5
	Low intensity	<1
	Moderate intensity	<1
Barren		<1
Population/km^2[b]		1
# NPDES Permits[c]	**TOTAL**	10
Construction Stormwater		9
Municipal Individual		1

a.Southern Limestone/Dolomite Valleys and Low Rolling Hills
b.2000 US Census
c.#NPDES permits downloaded from ADEM's NPDES Management System database, May 13, 2013.

Table 2. Physical characteristics of Weewoka Creek at WWOT-37, June 12, 2013.

Physical Characteristics		
Width (ft)		30
Canopy Cover		Estimate 50/50
Depth (ft)		
	Riffle	0.8
	Run	1.3
	Pool	1.0
% of Reach		
	Riffle	70
	Run	5
	Pool	25
% Substrate		
	Boulder	1
	Cobble	30
	Gravel	39
	Hard Pan Clay	1
	Sand	10
	Silt	14
	Organic Matter	5

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 in comparison to least-impaired reference reaches in the same ecoregion. The final score is the average of all individual metric scores. Metric results indicated the macroinvertebrate community to be in *poor* condition (Table 4).

Table 3. Results of the habitat assessment conducted on Weewoka Creek at WWOT-37, June 12, 2013.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	83	Optimal (>70)
Sediment Deposition	62	Sub-optimal (59-70)
Sinuosity	85	Optimal (>84)
Bank and Vegetative Stability	60	Sub-optimal (60-74)
Riparian Buffer	55	Marginal (50-69)
Habitat Assessment Score	**166**	
% Maximum Score	**69**	**Sub-optimal (59-70)**

Table 4. Results of macroinvertebrate bioassessment conducted in Weewoka Creek at WWOT-37, June 12, 2013.

Macroinvertebrate Assessment		
	Results	**Scores**
Taxa richness and diversity measures		**(0-100)**
# EPT taxa	13	39
Shannon Diversity	3.96	59
Taxonomic composition measures		
% EPT minus Baetidae and Hydropsychidae	6	12
% Non-insect taxa	17	28
Tolerance measures		
% Tolerant taxa	24	71
WMB-I Assessment Score	**---**	**41.9**
WMB-I Assessment Rating		**Poor (23-46)**

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected monthly during March through October of 2013 to help identify any stressors to the biological communities. Weewoka Creek at WWOT-37 met water quality criteria for its *Fish & Wildlife* use classification throughout the sampling season. Median nitrate+nitrite nitrogen and total nitrogen were higher than values expected based on data collected at reference reaches within the Southern Limestone/ Dolomite Valleys and Low Rolling Hills ecoregion (67f).

Table 5. Summary of water quality data collected March-October 2013. Minimum (Min) and maximum (Max) values calculated using minimum detection limits (MDL). Median (Med), 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	13.0	21.8	20.8	18.8	3.2
Turbidity (NTU)	9	2.5	23.8	6.5	9.0	7.8
Total Dissolved Solids (mg/L)	8	76.0	183.0	116.0	119.1	31.2
J Total Suspended Solids (mg/L)	8	< 1.0	14.0	4.5	5.8	4.8
Specific Conductance (µmhos)	9	136.0	240.9	188.2	187.2	38.3
J Alkalinity (mg/L)	8	60.0	114.1	83.4	85.2	20.2
Stream Flow (cfs)	9	20.1	111.6	31.8	46.7	32.9
Chemical						
Dissolved Oxygen (mg/L)	9	7.6	9.9	8.4	8.6	0.8
pH (su)	9	7.0	7.9	7.7	7.6	0.3
Ammonia Nitrogen (mg/L)	8	< 0.008	0.029	0.009	0.010	0.008
Nitrate+Nitrite Nitrogen (mg/L)	8	0.571	1.281	0.906 M	0.904	0.251
J Total Kjeldahl Nitrogen (mg/L)	8	< 0.041	0.628	0.146	0.200	0.209
J Total Nitrogen (mg/L)	8	0.765	1.485	1.051 M	1.103	0.285
J Dissolved Reactive Phosphorus (mg/L)	8	0.005	0.043	0.014	0.019	0.014
J Total Phosphorus (mg/L)	8	0.008	0.087	0.024	0.035	0.029
CBOD-5 (mg/L)	8	< 2.0	< 2.0	1.0	1.0	0.0
Chlorides (mg/L)	8	2.6	4.1	3.1	3.1	0.5
Biological						
Chlorophyll a (ug/L)	8	< 0.10	1.57	0.16	0.43	0.58

J=estimate; M=value>90% of all verified ecoregional reference reach data collected in the ecoregion 67f; N=# samples.

SUMMARY

Overall habitat quality for Weewoka Creek at WWOT-37 was categorized as *sub-optimal* for this stream type due to a marginal riparian buffer and sedimentation issues. Bioassessment results indicated the macroinvertebrate community to be in *fair* condition. Water quality criteria were met for its *Fish & Wildlife* use classification throughout the sampling season. However, median nitrate+nitrite nitrogen and total nitrogen were higher than values expected based on data collected at reference reaches within the ecoregion (67f). The results from this report will be used to fully assess the use support status of Weewoka Creek for the 2014 Integrated Water Quality Report. However, further sampling may be required to get a representative assessment of the stream and to ensure that water quality and biological conditions remain stable.

FOR MORE INFORMATION, CONTACT:
Lacey Genard, ADEM Aquatic Assessment Unit
1350 Coliseum Boulevard Montgomery, AL 36110
(334) 260-2703 lacey.genard@adem.state.al.us