

Rock Creek at Winston County Rd 39 near Addison (34.22613/-87.14102)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Rock Creek watershed for biological and water quality monitoring as part of the [2007 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. Drought conditions prevented the completion of habitat and macroinvertebrate assessments.

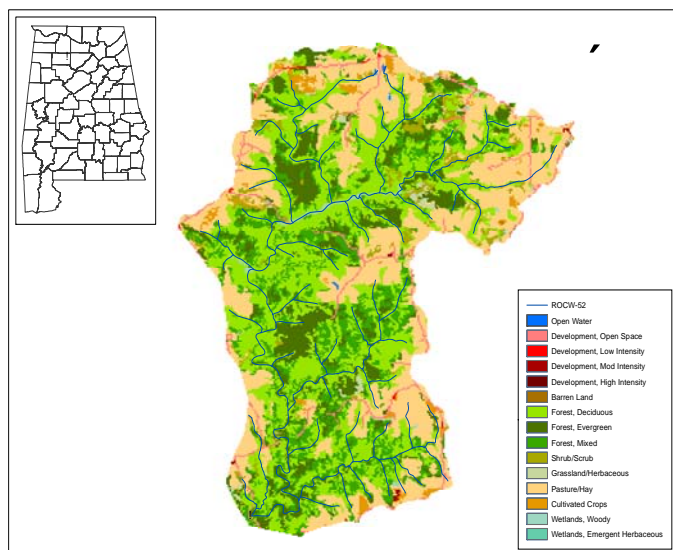


Figure 1. Sampling location and landuse within the Rock Creek watershed at ROCW-52.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin	Black Warrior River	
Drainage Area (mi²)	17	
Ecoregion^a	68d	
% Landuse		
Open water		<1
Wetland	Woody	1
	Emergent herbaceous	<1
	Deciduous	35
Forest	Evergreen	12
	Mixed	15
Shrub/scrub		3
Grassland/herbaceous		1
Pasture/hay		29
Cultivated crops		2
Development	Open space	3
	Low intensity	<1
	Moderate intensity	<1
Barren		<1
Population/km^{2b}		4

a. Southern Table Plateaus

b. 2000 US Census

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Rock Creek is a [Fish & Wildlife \(F&W\)](#) stream located in Winston County (Figure 1). Based on the 2000 National Land Cover dataset, landuse within the watershed is primarily forested (62%), with some pasture areas. Population density is relatively low in this area. As of February 23, 2011, the ADEM has issued no construction stormwater NPDES permits in this watershed.

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 2. [In situ measurements](#) and [water samples](#) were collected monthly, semi-monthly (metals), or quarterly (pesticides, atrazine, and semi-volatile organics) during March through October of 2007 to help identify any stressors to the biological communities.

Flow conditions were very low during the sampling period with measurements of 1.4 and 0.2 cfs in July and September, respectively. The stream was not flowing or was present as standing pools in late May, June and October. Dissolved oxygen concentrations were measured at 2.7 and 3.6 mg/L in August and September, respectively. Dissolved copper was higher in July than the established *F&W* criteria for background levels based on verified reference reach data collected in ecoregion 68d. Median specific conductance, dissolved reactive phosphorus and dissolved iron were higher than background levels based on reference reach data collected in this ecoregion.

SUMMARY

Due to drought conditions in 2007, the habitat and macroinvertebrate assessments were not completed for Rock Creek at ROCW-52. Low stream flows during July, August, and September may account for the low dissolved oxygen concentrations and other water quality conditions. Further sampling is recommended to accurately assess the conditions of this watershed.

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Table 2. Summary of water quality data collected March-October, 2007. 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)	8	14.0	25.1	20.8	20.2	3.9	
Turbidity (NTU)	8	2.2	6.3	3.6	3.8	1.3	
Total Dissolved Solids (mg/L)	8	30.0	60.0	46.5	45.8	10.2	
Total Suspended Solids (mg/L)	8	<1.0	6.0	4.0	3.6	2.0	
Specific Conductance (µmhos)	8	41.9	80.3	54.9 ^G	56.8	12.9	
Hardness (mg/L)	4	7.5	21.0	11.6	12.9	6.1	
Alkalinity (mg/L)	8	8.9	128.9	16.4	30.1	40.4	
Stream Flow (cfs)	5	0.2	30.3	8.8	10.1	12.1	
Chemical							
Dissolved Oxygen (mg/L)	8	2.7 ^C	9.8	6.3	6.5	2.6	2
pH (su)	8	6.4	7.1	6.7	6.7	0.3	
Ammonia Nitrogen (mg/L)	8	<0.015	0.091	0.033	0.034	0.029	
Nitrate+Nitrite Nitrogen (mg/L)	8	0.045	0.949	0.247	0.322	0.318	
Total Kjeldahl Nitrogen (mg/L)	8	<0.150	0.703	0.314	0.363	0.224	
Total Nitrogen (mg/L)	8	<0.240	1.024	0.778	0.685	0.259	
Dissolved Reactive Phosphorus (mg/L)	8	0.010	0.038	0.020 ^M	0.022	0.010	
Total Phosphorus (mg/L)	8	0.033	0.072	0.046	0.049	0.015	
CBOD-5 (mg/L)	8	<1.0	1.3	0.8	0.8	0.4	
^J Chlorides (mg/L)	8	2.0	3.7	3.1	3.0	0.5	
Atrazine (µg/L)	2	<0.05	0.05	0.04	0.04	0.02	
Total Metals							
^J Aluminum (mg/L)	4	<0.039	<0.5	0.131	0.138	0.090	
^J Iron (mg/L)	4	0.120	0.745	0.553	0.493	0.280	
^J Manganese (mg/L)	4	0.013	0.185	0.052	0.076	0.078	
Dissolved Metals							
Aluminum (mg/L)	4	<0.015	<0.500	0.133	0.131	0.106	
Antimony (µg/L)	4	<1.6	<7.5	1.0	1.6	1.4	
Arsenic (µg/L)	4	<0.5	<5.0	1.1	1.2	0.9	
Cadmium (mg/L)	4	<0.00003	<0.005	0.001	0.001	0.001	
Chromium (mg/L)	4	<0.002	<0.005	0.002	0.002	0.001	
Copper (mg/L)	4	<0.002	0.010 ^S	0.002	0.004	0.004	1
^J Iron (mg/L)	4	0.110	0.586	0.425 ^M	0.386	0.220	
Lead (µg/L)	4	<1.1	<5.0	0.7	1.1	0.9	
^J Manganese (mg/L)	4	0.012	0.190	0.040	0.070	0.082	
^J Mercury (µg/L)	4	<0.03	<0.5	0.2	0.2	0.1	
^J Nickel (mg/L)	4	<0.005	0.009	0.003	0.004	0.003	
Selenium (µg/L)	4	<1.6	<7.5	0.8	1.5	1.5	
Silver (mg/L)	4	<0.00004	<0.003	0.001	0.001	0.001	
Thallium (µg/L)	4	<0.6	<9.0	0.4	1.4	2.0	
Zinc (mg/L)	3	<0.002	<0.006	0.003	0.002	0.001	
Biological							
^J Chlorophyll a (ug/L)	8	0.67	2.14	1.07	1.32	0.54	
^J Fecal Coliform (col/100 mL)	8	2	240	37	53	78	

C=F&W criteria exceeded; E=# samples that exceeded criteria; G=value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 68d; J=estimate; M=value >90% of all verified ecoregional reference reach data collected in the ecoregion 68d; N=# samples; S=F&W hardness-adjusted aquatic life use criteria exceeded.