

2007 Assessment Summary

Warrior Creek at Cullman County Road 56 (34.27814/-86.47058)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Warrior Creek watershed for biological and water quality monitoring as part of the 2007 Assessment of the Black Warrior and Cahaba (BWC) River Basins.

Habitat and macroinvertebrate assessments were conducted to assess the biological integrity of each monitoring site and to estimate overall water quality within the BWC basins. Habitat and macroinvertebrate assessments of Warrior Creek at WARB-2, could not be conducted due to no flow conditions.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Warrior Creek is a small *Fish & Wildlife (F&W)* stream located in the Southern Table Plateaus ecoregion (68d). Based on the 2000 National Land Cover Dataset, landuse within the watershed is primarily pasture/hay with some forest (24%) (Figure 1). Population density is low within the watershed. As of February 23, 2011, ADEM's NPDES management database showed no permitted discharges located within the watershed.

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 2. When possible, in situ measurements and water samples were collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides (atrazine), and semi-volatile organics) during March through October at Basin Assessment stations to help identify any stressors to the biological communities. Due to no-flow conditions, water samples were only collected March through June of 2007, with flows ranging from 0.4-1.3 cfs. Metals were collected in March and May.

SUMMARY

Warrior Creek at WARB-2 was selected for biological and water quality monitoring as part of the 2007 assessment of the BWC River Basins. However, because the reach was dry during five of nine station visits, habitat and macroinvertebrate assessments could not be conducted, and water samples could not be collected during those visits. Additional monitoring will need to be conducted before biological conditions at this site can be assessed.



Figure 1. Reach characteristics of Sloan Creek at SLOW-11 on May 8, 2012.

Table 1. Summary of watershed characteristics.

| Watershed Characteristics | | |
|----------------------------------|---------------------|----|
| Basin | Black Warrior River | |
| Drainage Area (mi ²) | 3 | |
| Ecoregion ^a | 68d | |
| % Landuse | | |
| Open water | | <1 |
| Wetland | Woody | <1 |
| Forest | Deciduous | 18 |
| | Evergreen | 2 |
| | Mixed | 4 |
| Shrub/scrub | | 8 |
| Grassland/herbaceous | | 1 |
| Pasture/hay | | 50 |
| Cultivated crops | | 8 |
| Development | Open space | 7 |
| | Low intensity | 1 |
| | Moderate intensity | <1 |
| Barren | | <1 |
| Population/km ^{2b} | 19 | |
| # NPDES Permits ^c | TOTAL | 0 |

a.Southern Table Plateaus

b.2000 US Census

c.#NPDES permits downloaded from ADEM's NPDES Management System database, February 23, 2011

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 for non-metals parameters. 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 | Median | Avg | SD | E |
|--|---|---------|------------------|-------------------|-------|-------|---|
| Physical | | | | | | | |
| Temperature (°C) | 4 | 14.0 | 21.0 | 19.8 | 18.7 | 3.2 | |
| Turbidity (NTU) | 4 | 2.5 | 3.3 | 3.2 | 3.1 | 0.4 | |
| Total Dissolved Solids (mg/L) | 4 | 44.0 | 76.0 | 49.0 | 54.5 | 15.1 | |
| Total Suspended Solids (mg/L) | 4 | 3.0 | 5.0 | 3.5 | 3.8 | 1.0 | |
| Specific Conductance (µmhos) | 4 | 68.0 | 99.9 | 74.5 ^G | 79.2 | 14.2 | |
| Hardness (mg/L) | 1 | | | | 28.0 | | |
| Alkalinity (mg/L) | 4 | 12.1 | 41.1 | 21.4 | 24.0 | 12.2 | |
| Stream Flow (cfs) | 3 | 0.4 | 1.3 | 0.9 | 0.9 | 0.4 | |
| Chemical | | | | | | | |
| Dissolved Oxygen (mg/L) | 4 | 2.2 | 11.1 | 8.9 | 7.8 | 3.9 | |
| pH (su) | 4 | 6.3 | 7.5 | 7.0 | 6.9 | 0.5 | |
| Ammonia Nitrogen (mg/L) | 4 | < 0.015 | 0.191 | 0.008 | 0.053 | 0.092 | |
| Nitrate+Nitrite Nitrogen (mg/L) | 4 | 0.076 | 1.439 | 0.743 | 0.750 | 0.559 | |
| Total Kjeldahl Nitrogen (mg/L) | 4 | 0.217 | 0.696 | 0.464 | 0.460 | 0.202 | |
| Total Nitrogen (mg/L) | 4 | 0.772 | 1.656 | 1.207 | 1.210 | 0.361 | |
| Dissolved Reactive Phosphorus (mg/L) | 4 | 0.009 | 0.035 | 0.020 | 0.021 | 0.013 | |
| Total Phosphorus (mg/L) | 4 | 0.022 | 0.036 | 0.034 | 0.031 | 0.006 | |
| CBOD-5 (mg/L) | 4 | < 1.0 | 1.8 | 0.8 | 1.0 | 0.6 | |
| Chlorides (mg/L) | 4 | 3.8 | 4.6 | 4.5 | 4.4 | 0.4 | |
| Total Metals | | | | | | | |
| Aluminum (mg/L) | 2 | < 0.160 | < 0.500 | 0.205 | 0.205 | 0.064 | |
| Iron (mg/L) | 2 | 0.180 | 0.200 | 0.190 | 0.190 | 0.014 | |
| Manganese (mg/L) | 2 | 0.019 | 0.038 | 0.028 | 0.028 | 0.013 | |
| Dissolved Metals | | | | | | | |
| Aluminum (mg/L) | 2 | < 0.170 | < 0.500 | 0.210 | 0.210 | 0.057 | |
| Antimony (µg/L) | 2 | < 1.6 | < 7.5 | 2.3 | 2.3 | 2.1 | |
| Arsenic (µg/L) | 2 | < 0.5 | 5.0 ^H | 2.6 | 2.6 | 3.4 | 1 |
| Cadmium (mg/L) | 2 | < 0.000 | < 0.000 | 0.000 | 0.000 | 0.000 | |
| Chromium (mg/L) | 2 | < 0.002 | < 0.005 | 0.002 | 0.002 | 0.001 | |
| Copper (mg/L) | 2 | < 0.002 | < 0.005 | 0.002 | 0.002 | 0.001 | |
| Iron (mg/L) | 2 | 0.110 | 0.130 | 0.120 | 0.120 | 0.014 | |
| Lead (µg/L) | 2 | < 1.1 | < 5.0 | 1.5 | 1.5 | 1.4 | |
| Manganese (mg/L) | 2 | 0.018 | 0.030 | 0.024 | 0.024 | 0.008 | |
| Mercury (µg/L) | 2 | < 0.5 | < 0.5 | 0.2 | 0.2 | 0.0 | |
| ^J Nickel (mg/L) | 2 | < 0.004 | < 0.005 | 0.003 | 0.003 | 0.001 | |
| Selenium (µg/L) | 2 | < 1.6 | < 7.5 | 2.3 | 2.3 | 2.1 | |
| Silver (mg/L) | 2 | < 0.000 | < 0.001 | 0.000 | 0.000 | 0.000 | |
| Thallium (µg/L) | 2 | < 1.2 | < 9.0 | 2.6 | 2.6 | 2.8 | |
| Zinc (mg/L) | 1 | | | | 0.002 | | |
| Biological | | | | | | | |
| ^J Chlorophyll a (µg/L) | 4 | 2.14 | 4.27 | 3.20 | 3.20 | 0.97 | |
| ^J Fecal Coliform (col/100 mL) | 4 | 50 | 390 | 115 | 168 | 152 | |

E=# samples that exceeded criteria; G=value > median of all reference reach data collected for ecoregion 68d; H=F&W human health criterion exceeded; J=estimate; N=# samples.

FOR MORE INFORMATION, CONTACT:
Ruth Young, ADEM Aquatic Assessment Unit
1350 Coliseum Boulevard Montgomery, AL 36110
(334) 260-2762 ryoung@adem.state.al.us