Alabama Department of Environmental Management

Basin Assessment Site

Rivers and Streams Monitoring Program

2007 Assessment Summary

Pegues Creek near Black Warrior River confluence (Tuscaloosa County) (33.35900,-87.39320)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Pegues 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 are conducted to assess the biological integrity of each monitoring site and to estimate overall water quality within the BWC basins. Assessments of habitat quality and macroinvertebrate community were attempted for Pegues Creek at PGC-1, but could not be completed due to no flow.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Pegues Creek is a *Fish & Wildlife (F&W)* stream located in the Southwestern Appalachians ecoregion (68) and the Shale Hills sub-ecoregion (68f) (Figure 1). Based on the 2000 National Land Cover Dataset, landuse within the watershed is primarily forest (92%) with small amounts of shrub/scrub and grassland/herbaceous. Population density is very low within the watershed. As of February 23, 2011, ADEM's NPDES management database showed four 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 in March, April, and July. Metals were collected in March and July. The median value for total dissolved solids and total suspended solids was above the 90th percentile of all reference reach data collected in the Southwestern Appalachians ecoregion (68). Median specific conductance and hardness were above the median values of all reference reach data for this ecoregion. Additionally, turbidity was higher than expected for this ecoregion during one site visit (March 26, 2007).

SUMMARY

Pegues Creek at PGC-1 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 eight 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. Pegues Creek at PGC-1, February 2007.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Black Warrior River
Drainage Area (mi^2)		10
Ecoregion[a]		68f
% Landuse		
Open water		<1
Wetland	Woody	1
	Emergent Herbaceous	<1
Forest	Deciduous	44
	Evergreen	36
	Mixed	12
Shrub/scrub		3
Grassland/herbaceous		2
Pasture/hay		<1
Cultivated crops		<1
Development	Open space	1
	Low intensity	<1
	Moderate intensity	<1
Barren		1
Population/km^2[b]		<1
# NPDES Permits[c]	**TOTAL**	4
Construction Stormwater		3
Mining		1

a.Shale Hills

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	Med	Avg	SD
Physical						
Temperature (°C)	3	17.8	26.8	21.0	21.9	4.6
Turbidity (NTU)	5	0.0	160.0 T	1.0	32.4	71.3
Total Dissolved Solids (mg/L)	3	18.0	172.0	147.0 M	112.3	82.6
Total Suspended Solids (mg/L)	3	6.0	81.0	15.0 M	34.0	41.0
Specific Conductance (µmhos)	3	155.0	234.9	202.7 G	197.5	40.2
Hardness (mg/L)	2	61.0	85.6	73.3 G	73.3	17.4
Alkalinity (mg/L)	3	17.4	35.6	17.7	23.6	10.4
Stream Flow (cfs)	3	0.5	12.1	1.6	4.7	6.4
Chemical						
Dissolved Oxygen (mg/L)	3	7.9	9.5	8.9	8.8	0.8
pH (su)	3	6.9	7.4	7.1	7.1	0.2
Ammonia Nitrogen (mg/L)	3	< 0.015	< 0.015	0.008	0.008	0.000
Nitrate+Nitrite Nitrogen (mg/L)	3	0.005	0.124	0.063	0.064	0.060
Total Kjeldahl Nitrogen (mg/L)	3	< 0.150	0.260	0.075	0.137	0.107
Total Nitrogen (mg/L)	3	< 0.080	0.384	0.138	0.201	0.161
Dissolved Reactive Phosphorus (mg/L)	3	0.011	0.068	0.012	0.030	0.033
J Total Phosphorus (mg/L)	3	0.015	0.053	0.022	0.030	0.020
CBOD-5 (mg/L)	3	< 1.0	1.2	1.0	0.9	0.4
J Chlorides (mg/L)	3	2.0	7.0	2.6	3.9	2.7
Total Metals						
Aluminum (mg/L)	2	< 0.015	0.120	0.064	0.064	0.080
Iron (mg/L)	2	< 0.005	0.030	0.016	0.016	0.019
Manganese (mg/L)	2	0.010	0.010	0.010	0.010	0.000
Dissolved Metals						
Aluminum (mg/L)	2	< 0.015	< 0.100	0.029	0.029	0.030
Antimony (µg/L)	2	< 1.6	< 2.0	0.9	0.9	0.1
Arsenic (µg/L)	1				0.5	
Cadmium (mg/L)	2	< 0.000	< 0.005	0.001	0.001	0.002
Chromium (mg/L)	2	0.002	< 0.004	0.002	0.002	0.000
Copper (mg/L)	2	< 0.002	< 0.005	0.002	0.002	0.001
Iron (mg/L)	2	< 0.005	0.018	0.010	0.010	0.011
Lead (µg/L)	2	< 1.1	< 1.5	0.6	0.6	0.1
Manganese (mg/L)	2	0.009	0.010	0.010	0.010	0.001
J Mercury (µg/L)	2	< 0.3	< 0.5	0.2	0.2	0.1
Nickel (mg/L)	2	< 0.004	< 0.006	0.002	0.002	0.001
Selenium (µg/L)	2	< 1.6	< 1.6	0.8	0.8	0.0
Silver (mg/L)	2	< 0.0	< 0.0	0.0	0.0	0.0
Thallium (µg/L)	2	< 0.6	< 1.2	0.4	0.4	0.2
Zinc (mg/L)	2	0.002	< 0.006	0.002	0.002	0.001
Biological						
Chlorophyll a (ug/L)	3	0.38	1.34	1.07	0.93	0.50
J Fecal Coliform (col/100 mL)	3	9	700	10	240	399

N= # samples; J= estimate; M= value > 90th percentile of all verified ecoregional reference reach data collected within ecoregion 68; G= value > median of all reference reach data collected for ecoregion 68; T=value exceeds 50 NTU above the 90th percentile of all verified ecoregional reference reach data collected in ecoregion 68.

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