

# 2009 Monitoring Summary



## Childers Creek at Dallas County Road 65 (32.47312/-87.05979)

### BACKGROUND

The Alabama Department of Environmental Management selected Childers Creek for biological and water quality monitoring in order to fulfill the requirements of §319(b) of the Clean Water Act. This section mandates that all states develop and implement non-point source monitoring programs using shared information and experience with the goal of reducing the amount of surface run-off and other man-made sources of pollution.

Childers Creek, from the Cahaba River to its source (approximately 18 miles), was placed on the 2008 Clean Water Act §303(d) list of impaired waters due to siltation from habitat alteration and pasture grazing. It was monitored in 2009 to document water quality conditions before implementation of the Childers Creek Watershed Management Plans (WMP's). The WMP was designed to improve water quality of Childers Creek and potentially remove it from the §303(d) list.



Figure 1. Childers Creek at CHLD-3, March 24, 2009.

### WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Childers Creek is a very small *Fish & Wildlife (F&W)* stream in northern Selma. Based on the 2000 National Land Cover Dataset, landuse within the watershed is forest (40%) and pasture. As of February 23, 2011, the Alabama Department of Environmental Management has not issued any NPDES permits in this watershed.

### REACH CHARACTERISTICS

General observations (Table 2) and a habitat assessment (Table 3) were completed during the macroinvertebrate assessment. Childers Creek at CHLD-3 is a very shallow, sand-bottomed, low-gradient stream in the Fall Line Hills ecoregion (Figure 1). Additional data will be collected to monitor habitat conditions after the WMP is fully implemented.

### 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. 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 1. Summary of watershed characteristics.

Watershed Characteristics		Cahaba River
<b>Basin</b>		Cahaba River
<b>Drainage Area (mi<sup>2</sup>)</b>		2
<b>Ecoregion<sup>a</sup></b>		65i
<b>% Landuse</b>		
Open water		3
Wetland	Woody	1
Forest	Deciduous	19
	Evergreen	6
	Mixed	15
Shrub/scrub		17
Pasture/hay		26
Cultivated crops		8
Development	Open space	5
	Low intensity	<1
<b>Population/km<sup>2b</sup></b>		35

- a. Fall Line Hills  
b. 2000 US Census

Table 2. Physical characteristics of Childers Creek at CHLD-3, May 29, 2009.

Physical Characteristics		
<b>Width (ft)</b>		6
<b>Canopy Cover</b>		Shaded
<b>Depth (ft)</b>		
	Run	0.4
	Pool	0.5
<b>% of Reach</b>		
	Run	95
	Pool	5
<b>% Substrate</b>		
	Gravel	1
	Sand	84
	Silt	2
	Organic Matter	13

**Table 3.** Results of the habitat assessment conducted on Childers Creek at CHLD-3, May 29, 2009.

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	24	Poor <40
Sediment Deposition	61	Sub-optimal (53-65)
Sinuosity	45	Marginal (45-64)
Bank and Vegetative Stability	48	Marginal (35-59)
Riparian Buffer	79	Sub-optimal (70-89)
<b>Habitat Assessment Score</b>	<b>113</b>	
<b>% Maximum Score</b>	<b>51</b>	<b>Marginal (40-52)</b>

**Table 4.** Results of the macroinvertebrate bioassessment conducted on Childers Creek, May 29, 2009.

Macroinvertebrate Assessment		Results
<b>Taxa richness and diversity measures</b>		
# EPT taxa		8
<b>Taxonomic composition measures</b>		
% Non-insect taxa		14
% Plecoptera		7
% Dominant taxon		29
<b>Functional feeding group</b>		
% Predators		13
<b>Community tolerance</b>		
Becks community tolerance index		1
% Nutrient tolerant individuals		53
<b>WMB-I Assessment Score</b>		<b>36</b>
<b>WMB-I Assessment Rating</b>		<b>Poor (19-37)</b>

## WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. When possible, in situ measurements and water samples are collected monthly, semi-monthly (metals), or quarterly (pesticides, atrazine, and semi-volatile organics) from March through October 2009 to help identify any stressors to the biological communities. Stream flow was very low (<1 cubic feet per second) during the June, July, August, and September sampling events. Median values for specific conductance and chlorides were greater than expected for streams in ecoregion 65i. Stream pH was <6.0 during the March and April sampling events.

**Table 5.** Summary of water quality data collected March-October, 2005. 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
<b>Physical</b>							
Temperature (°C)	9	13.1	23.8	19.6	19.5	3.9	
Turbidity (NTU)	9	10.5	23.7	17.1	16.7	4.4	
<sup>J</sup> Total Dissolved Solids (mg/L)	8 <	1.0	98.0	51.0	51.8	35.3	
<sup>J</sup> Total Suspended Solids (mg/L)	8	4.0	15.0	8.0	8.4	3.5	
Specific Conductance (µmhos)	9	42.0	70.2	52.2 <sup>G</sup>	54.5	8.5	
Alkalinity (mg/L)	8	7.6	24.0	13.0	13.7	5.2	
Stream Flow (cfs)	9	0.1	3.9	1.5	1.3	1.2	
<b>Chemical</b>							
Dissolved Oxygen (mg/L)	9	7.7	9.7	8.0	8.4	0.7	
pH (su)	9	5.5 <sup>C</sup>	7.0	6.3	6.3	0.5	2
Ammonia Nitrogen (mg/L)	8 <	0.006	0.050	0.007	0.014	0.016	
<sup>J</sup> Nitrate+Nitrite Nitrogen (mg/L)	8	0.049	0.125	0.088	0.089	0.022	
Total Kjeldahl Nitrogen (mg/L)	8 <	0.089	0.559	0.284	0.304	0.160	
<sup>J</sup> Total Nitrogen (mg/L)	8 <	0.120	0.608	0.396	0.393	0.159	
<sup>J</sup> Dissolved Reactive Phosphorus (mg/L)	8	0.009	0.016	0.012	0.012	0.002	
Total Phosphorus (mg/L)	8	0.029	0.054	0.042	0.042	0.009	
CBOD-5 (mg/L)	8 <	2.0	< 2.0	1.0	1.0	0.0	
Chlorides (mg/L)	8	3.8	5.8	5.0 <sup>M</sup>	5.0	0.6	

C= F&W criterion violated; E=# samples that exceeded criteria; G=value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 65i; J=estimate; M=value >90% of all verified ecoregional reference reach data collected in the ecoregion 65i; N=# samples;

## SUMMARY

Since 2008, Childers Creek has been on Alabama's CWA §303(d) list of impaired waters for siltation from habitat alteration and pasture grazing. It was monitored in 2009 to document water quality conditions before implementation of the Childers Creek WMP. Metric results indicated the macroinvertebrate community to be in *poor* condition. Additional data will be collected to assess habitat, biological, and water quality conditions after the WMP is fully implemented.

### FOR MORE INFORMATION, CONTACT:

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