

2007 Monitoring Summary

Boggy Branch at Mobile County Road 5 south of Wilmer (30.7873/-88.3667)

BACKGROUND

Boggy Branch, from Big Creek Lake to its source, was on [Alabama's 2004 Clean Water Act \(CWA\) §303\(d\) list](#) of impaired waters for partially meeting its [Fish and Wildlife \(F&W\)](#) water use classifications due to metals (Iron). This report summarizes sampling activities undertaken for that stream segment.

The Alabama Department of Environmental Management (ADEM) collected water chemistry samples monthly, quarterly (COD), and annually (atrazine) from Boggy Branch at BGYM-1 to assess impairment and estimate overall water quality. Habitat and benthic macroinvertebrate community assessments were requested to assess the impact of metals on the biological communities. However, they could not be conducted due to unwadeable conditions at this reach.



Figure 1. Boggy Branch at BGYM-1, November 1, 2010.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Escatawpa River
Drainage Area (mi ²)		3
Ecoregion ^a		65f
% Landuse		
Open water		1
Wetland	Woody	10
	Emergent herbaceous	1
Forest	Deciduous	2
	Evergreen	36
	Mixed	6
Shrub/scrub		20
Grassland/herbaceous		<1
Pasture/hay		10
Cultivated crops		9
Development	Open space	4
	Low intensity	<1
	Moderate intensity	<1
Population/km ^{2b}		11
# NPDES Permits ^c	TOTAL	4
	Construction Stormwater	3
	Mining	1

a.Southern Pine Plains & Hills

b.2000 US Census

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

WATERSHED CHARACTERISTICS

The Boggy Branch watershed at BGYM-1 drains approximately 3 mi² of the Southern Pine Plains & Hills Ecoregion (65f) (Figure 1; [Griffith et al. 2001](#)). This station is located approximately one-half mile upstream of and lies within the influence of the backwater area of Big Creek Lake. Pine forest characterizes the majority of this watershed (36%). Areas of shrub/scrub, woody wetland, and pasture/hay also occur within the watershed (Table 1). As of February 23, 2011, the Department has issued three construction stormwater and one mining permit in this drainage area.

WATER CHEMISTRY

Results of monthly water chemistry samples collected March through October of 2007 are presented in Table 2. Stream pH values were below 6.0 standard units (s.u) during six of eight sample collections, but streams in this region of the state are naturally acidic. Dissolved mercury and thallium concentrations exceeded human health criterion for the consumption of fish during one or more sampling events. Dissolved cadmium, lead, and mercury concentrations exceeded the chronic freshwater aquatic life use criterion during one or more sampling events.

SUMMARY

Boggy Branch was on [Alabama's 2004 CWA §303\(d\) list](#) of impaired waters for partially meeting its [F&W](#) water use classifications due to metals (Iron). Water quality sampling indicted the presence of several other metals (dissolved mercury, thallium, cadmium, lead) at concentrations exceeding aquatic life use and human health criteria.

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	15.5	25.0	21.7	20.6	3.9	
Turbidity (NTU)	8	2.8	9.2	5.5	5.6	2.1	
Total Dissolved Solids (mg/L)	8	30.0	55.0	44.5	43.4	8.2	
Total Suspended Solids (mg/L)	8	<5.0	10.0	3.8	4.6	2.7	
Specific Conductance (µmhos)	8	30.0	41.0	34.0	35.0	3.5	
Hardness (mg/L)	8	8.0	11.0	9.5	9.4	1.1	
Alkalinity (mg/L)	8	4.0	10.0	6.0	6.6	1.9	
Stream Flow (cfs)	4	1.5	2.6	2.0	2.0	0.6	
Chemical							
Dissolved Oxygen (mg/L)	8	5.0	7.7	5.8	6.1	1.1	
pH (su)	8	5.0 ^C	7.6	5.4	5.9	1.1	
Ammonia Nitrogen (mg/L)	8	<0.010	0.070	0.015	0.023	0.021	
Nitrate+Nitrite Nitrogen (mg/L)	8	0.009	0.126	0.062	0.069	0.036	
Total Kjeldahl Nitrogen (mg/L)	8	0.290	0.880	0.500	0.535	0.202	
Total Nitrogen (mg/L)	8	0.372	0.929	0.592	0.604	0.197	
Dissolved Reactive Phosphorus (mg/L)	8	<0.004	0.010	0.006	0.005	0.002	
Total Phosphorus (mg/L)	8	<0.005	0.046	0.020	0.022	0.013	
CBOD-5 (mg/L)	8	<1.0	<1.0	0.5	0.5	0.0	
Chlorides (mg/L)	8	<6.0	7.0	3.0	4.4	1.9	
Total Metals							
Aluminum (mg/L)	8	0.190	0.300	0.220	0.238	0.045	
Iron (mg/L)	8	0.886	3.800	2.030	2.184	1.030	
Manganese (mg/L)	8	0.040	0.680	0.113	0.205	0.214	
Dissolved Metals							
Aluminum (mg/L)	8	<0.060	0.190	0.095	0.096	0.045	
Antimony (µg/L)	8	<1.6	< 5	0.8	1.4	0.9	
^J Arsenic (µg/L)	8	<1	2 ^H	1	1	1	1
Cadmium (mg/L)	8	<0.00002	0.0015 ^S	0.0003	0.0004	0.0005	1
Chromium (mg/L)	8	<0.002	0.010	0.005	0.004	0.002	
Copper (mg/L)	8	<0.002	0.010	0.005	0.004	0.002	
Iron (mg/L)	8	0.320	0.480	0.354	0.377	0.055	
^J Lead (µg/L)	8	<1	5 ^S	1	1	1	2
^J Manganese (mg/L)	8	<0.01	0.690	0.080	0.177	0.225	
Mercury (µg/L)	8	<0.5	0.8 ^{AH}	0.2	0.4	0.2	2
Nickel (mg/L)	8	<0.004	0.010	0.005	0.004	0.002	
Selenium (µg/L)	8	<1.6	5.0	0.8	1.4	0.9	
^J Silver (mg/L)	8	<0.00002	0.0005	0.0004	0.0003	0.0002	
Thallium (µg/L)	8	<1.2	9.0 ^H	1.9	2.2	1.9	1
^J Zinc (mg/L)	8	<0.002	0.010	0.005	0.004	0.002	
Biological							
^J Fecal Coliform (col/100 mL)	8	22	370	68	143	141	

A= F&W aquatic life use criteria exceeded; C=F&W criteria violated; E=# samples that exceeded criteria; H=F&W human health criteria exceeded; J=estimate; N=# samples; S=F&W hardness-adjusted aquatic life use criteria exceeded.

FOR MORE INFORMATION, CONTACT:
 Brien Diggs ADEM\FOD
 Environmental Indicators Section
 1350 Coliseum Boulevard Montgomery, AL 36110
 (334) 260-2750 lod@adem.state.al.us