

2005 Monitoring Summary

Cubahatchee Creek at Macon County Road 2 (32.26220/-85.75930)

BACKGROUND

Cubahatchee Creek, from the Tallapoosa River to its source, was added to Alabama's 2004 Clean Water Act (CWA) §303(d) list of impaired waters for not meeting its *Swimming (S)/Fish and Wildlife (F&W)* water use classifications due to siltation (habitat alteration) from agriculture and surface mining. The 2006 CWA §303(d) list added pathogens as a cause of impairment for the segment of Cubahatchee Creek from Coon Hop Creek to the Tallapoosa River, downstream of Macon County Road 2.

The Alabama Department of Environmental Management (ADEM) collected water chemistry samples monthly on Cubahatchee Creek at CUBM-1 to monitor upstream conditions and evaluate the upstream reaches of Cubahatchee Creek as a source of sediment loading. Habitat assessment and benthic macroinvertebrate community assessments were requested to assess the impact of siltation on the biological communities. However, they could not be conducted due to non-wadeable conditions in this reach.

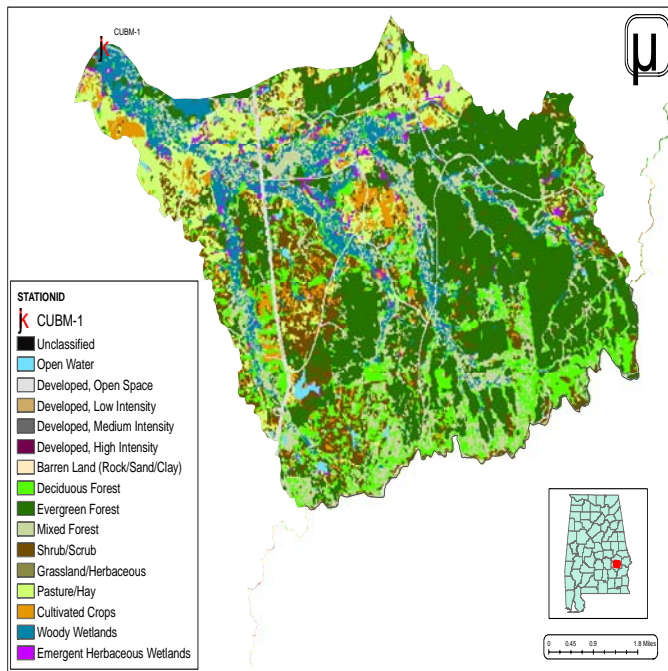


Figure 1. Sampling location and watershed of Cubahatchee Creek at CUBM-1.

Table 1. Summary of watershed characteristics .

Watershed Characteristics	
Drainage Area (mi ²)	49
Ecoregion ^a	65b
% Landuse	
Open water	1
Wetland	Woody 9
	Emergent herbaceous 1
Forest	Deciduous 13
	Evergreen 32
	Mixed 14
Shrub/scrub	12
Grassland/herbaceous	<1
Pasture/hay	10
Cultivated crops	4
Development	Open space 3
	Low intensity <1
Population/km ^{2b}	15
# NPDES Permits ^c	TOTAL 2
Construction Stormwater	2

a. Flatwood/Blackland Prairie Margins

b. 2000 U.S. Census Data

c. #NPDES permits downloaded from ADEM's NPDES Management System database, 9 June 2008.

WATERSHED CHARACTERISTICS

The Cubahatchee Creek watershed at CUBM-1 drains approximately 49 mi² of the Flatwood/Blackland Prairie Margins Ecoregion (65b). Pine and mixed forest characterize the majority of this watershed (~60%) (Fig. 1). Areas of pasture and hay are also interspersed within the watershed (Table 1).

WATER CHEMISTRY

Results of monthly water chemistry samples collected from March through October of 2005 are presented in Table 2. Fecal coliform counts were >2000 colonies/100ml during three sampling events (March 17, April 7, and July 7), exceeding the criteria for S/F&W use classifications. Turbidity was measured at 54.1 NTU and 79.6 NTU on April 7 and July 7 respectively. Heavy rainfall on and before the March 17, April 7, and July 7 site visits may have contributed to the elevated turbidity and fecal coliform counts. Dissolved oxygen (DO) concentrations were less than 5 mg/L during the June 1, September 19 and October 26 site visits. Low flows on these dates possibly contributed to the low DO concentrations. Median chloride concentrations exceeded the 90th percentile of verified ecoregional reference reach samples for the 65b ecoregion.

Table 2. 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	Median	Avg	SD
Physical						
Temperature (°C)	8	10.6	25.0	21.5	19.5	5.7
Turbidity (NTU)	8	14.8	79.6	22.4	33.9	23.0
Total Dissolved Solids (mg/L)	7	54.0	141.0	95.0	98.6	34.3
Total Suspended Solids (mg/L)	7	4.0	83.0	17.0	32.4	28.2
Specific Conductance (µmhos)	8	56.0	250.5	156.4	158.2	58.5
Hardness (mg/L)	5	25.7	112.0	57.5	64.1	31.2
Alkalinity (mg/L)	7	14.6	63.2	55.9	48.9	16.5
Chemical						
Dissolved Oxygen (mg/L)	8	3.3 ^C	8.7	5.7	5.7	1.9
pH (su)	7	6.7	8.15	7.2	7.3	0.5
Ammonia Nitrogen (mg/L)	7	< 0.015	0.088	0.017	0.025	0.029
Nitrate+Nitrite Nitrogen (mg/L)	7	< 0.003	0.239	0.037	0.081	0.089
Total Kjeldahl Nitrogen (mg/L)	7	0.164	1.289	0.561	0.614	0.423
Total Nitrogen (mg/L)	7	0.187	1.326	0.563	0.695	0.392
Dissolved Reactive Phosphorus (mg/L)	7	0.009	0.098	0.032	0.043	0.029
^J Total Phosphorus (mg/L)	7	0.079	0.284	0.113	0.133	0.069
CBOD-5 (mg/L)	7	< 1.0	5.0	2.1	2.7	1.5
^J Chlorides (mg/L)	7	4.5	24.1	9.6 ^M	10.9	6.2
Biological						
^J Fecal Coliform (col/100 mL)	7	67	3400	100	1238	1494

N=# samples; J=estimate; M=value > 90% of all verified ecological reference reach data collected in ecoregion 65b; C=value exceeds established criteria for *S* and *F&W* water use classification

CONCLUSIONS

Cubahatchee Creek at CUBM-1 was not wadeable, therefore, habitat and macroinvertebrate assessments could not be conducted. Heavy rainfall may have contributed to high fecal coliform counts and turbidity measured during March, April, and July. The low flow conditions may have contributed to low dissolved oxygen concentrations measured in June, September and October. The median chloride concentration exceeded the 90th percentile of verified ecoregional reference reach samples for the 65b ecoregion.

FOR MORE INFORMATION, CONTACT:
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