

2011 Monitoring Summary

Bilbo Creek at Washington County Road 19 crossing (31.29493/-88.15071)

BACKGROUND

Bilbo Creek, from the Tombigbee River to its source, has been on Alabama's Clean Water Act (CWA) §303(d) list of impaired waters since 2004. It was listed for organic enrichment/low dissolved oxygen from an unknown source. Since 2008, Bilbo Creek has also been listed for high mercury concentrations caused by atmospheric deposition and organic enrichment from an unknown source. The 2011 data obtained from Bilbo Creek at BLBW-7 will be used to support development of the organic enrichment/low dissolved oxygen Total Maximum Daily Load (TMDL) to address this impairment.

In addition, the Alabama Department of Environmental Management (ADEM) selected the Bilbo Creek watershed for biological and water quality monitoring as part of the 2011 Escatawpa, Mobile, and Tombigbee (EMT) Basin Assessment. The objectives of the project were to assess the biological integrity of each monitoring site and to estimate overall water quality within the basin. However, macroinvertebrate and habitat assessments could not be conducted due to stream flow reduced to intermittent pools.



Figure 1. Bilbo Creek at BLBW-7, September 21, 2011.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		Lower Tombigbee
Basin		27
Drainage Area (mi²)		65f
Ecoregion^a		
% Landuse		
Open water		<1
Wetland	Woody	7
	Emergent herbaceous	<1
Forest	Deciduous	3
	Evergreen	38
	Mixed	25
Shrub/scrub		16
Grassland/herbaceous		3
Pasture/hay		3
Cultivated crops		<1
Development	Open space	4
	Low intensity	<1
	Moderate intensity	<1
Barren		<1
Population/km^{2b}		3

a.Southern Pine Plains & Hills

b.2000 US Census

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Bilbo Creek at BLBW-7 is a small *Swimming/Fish and Wildlife (S/F&W)* stream located within the Southern Pine Plains and Hills ecoregion in Washington County (Figure 1). Based on the 2006 National Land Cover Dataset, landuse within the watershed was predominantly forest (66%) with some shrub/scrub areas. As of September 4, 2012, there were no NPDES permits issued within the watershed.

WATER CHEMISTRY

Water chemistry results are summarized in Table 5. In situ measurements and water samples were supposed to be collected March through October of 2011 to help identify any stressors to the biological communities. However, stream flow could only be measured once (August 1st). Flow conditions during all other station visits were low or flooded, preventing flow measurement. These conditions contributed to low dissolved oxygen concentrations during May and August and may also have affected median concentrations of specific conductance and total kjeldahl nitrogen, which were higher than expected for this stream type. Stream pH was below *S/F&W* use classification criterion during all sampling events; however, a low pH is not unusual for ecoregion 65f.

SUMMARY

As part of the assessment process, ADEM will review the monitoring information presented in this report, along with all other available data. The low dissolved oxygen may be attributed to low flow conditions at the time of sampling. Monitoring should be repeated under normal flow conditions to determine the cause of these impairments and to ensure that water quality conditions remain stable.

Table 5. Summary of water quality data collected March-August, 2011. 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)	4	13.5	27.8	20.4	20.5	6.4	
Turbidity (NTU)	4	5.1	19.9	6.5	9.5	7.0	
Total Dissolved Solids (mg/L)	3	32.0	46.0	44.0	40.7	7.6	
Total Suspended Solids (mg/L)	3	< 1.0	15.0	9.0	8.2	7.3	
Specific Conductance (µmhos)	4	28.6	42.0	33.5 ^G	34.4	6.8	
Alkalinity (mg/L)	3	< 2.4	< 2.4	1.2	1.2	0.0	
Stream Flow (cfs)	1				2.0		
Chemical							
Dissolved Oxygen (mg/L)	4	2.0 ^C	8.0	4.6	4.8	2.8	2
pH (su)	4	4.4 ^C	5.1 ^C	4.7	4.7	0.4	4
Ammonia Nitrogen (mg/L)	3	< 0.005	< 0.005	0.002	0.002	0.000	
Nitrate+Nitrite Nitrogen (mg/L)	3	< 0.004	< 0.004	0.002	0.002	0.000	
Total Kjeldahl Nitrogen (mg/L)	3	0.424	0.971	0.481 ^M	0.625	0.301	
Total Nitrogen (mg/L)	3	< 0.426	< 0.973	0.483	0.627	0.301	
^J Dissolved Reactive Phosphorus (mg/L)	3	0.004	0.012	0.009	0.008	0.004	
Total Phosphorus (mg/L)	3	0.010	0.024	0.012	0.015	0.008	
CBOD-5 (mg/L)	3	< 2.0	< 2.0	1.0	1.0	0.0	
Chlorides (mg/L)	3	3.3	4.3	4.1	3.9	0.5	
Biological							
Chlorophyll a (ug/L)	3	< 0.10	2.67	0.53	1.08	1.40	

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

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