

2007 Monitoring Summary

Thompson Creek at US Forest Service Road 208 in Bankhead National Forest (Lawrence County) (34.34100/-87.47120)

BACKGROUND

Thompson Creek is one of the streams the Alabama Department of Environmental Management (ADEM) monitors as a “best attainable condition” reference watershed for larger riffle-run streams throughout the state. The Thompson Creek watershed was selected for monitoring as a reference reach during the 2007 Assessment of the Black Warrior and Cahaba (BWC) River Basins. The data collected will be used for comparison with other streams in the Dissected Plateau ecoregion (68e).

Habitat and macroinvertebrate assessments were scheduled to be conducted on June 6, 2007 to assess biological conditions within the reach. Neither assessment could be conducted due to no flow conditions during the site visit.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Thompson Creek at TPSL-1 is a large *Fish & Wildlife (F&W)* stream located in Lawrence County. Based on the 2000 National Land Cover Dataset, land cover within the watershed is approximately 98% forested. Population density is very low. No NPDES permits have been issued in this watershed as of February 23, 2011.

REACH CHARACTERISTICS

Thompson Creek is a low-gradient stream reach located in the Dissected Plateau ecoregion (68e) (Table 1). The stream was not flowing during four of nine site visits. Figure 1 shows ideal winter flow conditions for Thompson Creek.

WATER CHEMISTRY

Results of water chemistry are presented in Table 5. Samples were scheduled to be collected monthly during March through October of 2007. However, samples were only collected March through May and July due to intermittent flow conditions during the remaining sampling months. *In situ* measurements indicated that Thompson Creek was meeting requirements for its classification as a *F&W* stream during the 2007 sampling year. Median values of most physical and chemical parameters without established criteria were similar to background levels as based on the 90th percentile of data collected in ecoregion 68e. However, specific conductivity was above median values of reference reach data during all four sampling events.

SUMMARY

Thompson Creek at TPSL-1 was selected for biological and water quality monitoring as a reference reach stream and as part of the 2007 assessment of the BWC River Basins. However, the reach was dry during four of nine station visits and habitat and macroinvertebrate assessments could not be conducted. Additional monitoring will need to be conducted before biological conditions at this site can be assessed.



Figure 1. Reach characteristics of Thompson Creek at TPSL-1 during ideal winter flow conditions, February 17, 2004.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin	Black Warrior River	
Drainage Area (mi²)	15	
Ecoregion^a	68e	
% Landuse		
Open water		<1
Wetland	Woody	<1
Forest	Deciduous	74
	Evergreen	11
	Mixed	13
Shrub/scrub		<1
Grassland/herbaceous		<1
Pasture/hay		<1
Cultivated crops		
Development	Open space	1
Population/km^{2b}	<1	

a. Dissected Plateau

b. 2000 US Census

Table 5. 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	Median	Avg	SD	E
Physical							
Temperature (°C)	4	17.0	22.1	17.8	18.7	2.3	
Turbidity (NTU)	4	1.4	4.0	2.7	2.7	1.1	
Total Dissolved Solids (mg/L)	4	70.0	109.0	79.0	84.2	18.0	
Total Suspended Solids (mg/L)	4	< 1.0	4.0	1.5	1.9	1.6	
Specific Conductance (µmhos)	4	72.0	127.0	85.5 ^G	92.5	24.3	4
Hardness (mg/L)	1				59.9		
Alkalinity (mg/L)	4	29.1	57.7	37.3	40.3	12.3	
Stream Flow (cfs)	3	3.3	9.9	3.6	5.6	3.7	
Chemical							
Dissolved Oxygen (mg/L)	4	7.9	9.5	8.8	8.7	0.7	
pH (su)	4	7.3	8.1	7.7	7.7	0.3	
Ammonia Nitrogen (mg/L)	4	< 0.015	0.037	0.008	0.015	0.015	
Nitrate+Nitrite Nitrogen (mg/L)	4	0.074	0.098	0.081	0.084	0.011	
Total Kjeldahl Nitrogen (mg/L)	4	< 0.150	0.427	0.174	0.213	0.171	
Total Nitrogen (mg/L)	4	< 0.149	0.502	0.267	0.296	0.167	
Dissolved Reactive Phosphorus (mg/L)	4	< 0.004	< 0.004	0.002	0.002	0.000	
Total Phosphorus (mg/L)	4	< 0.020	< 0.100	0.037	0.036	0.012	
CBOD-5 (mg/L)	4	< 0.1	1.2	0.4	0.5	0.6	
COD (mg/L)	2	< 3.2	< 5.0	2.8	2.8	0.5	
TOC (mg/L)	2	1.8	3.8	2.8	2.8	1.4	
Chlorides (mg/L)	4	0.9	1.2	0.8	0.9	0.3	
Atrazine (µg/L)	1				0.05		
Total Metals							
Aluminum (mg/L)	1				0.060		
Iron (mg/L)	1				0.153		
Manganese (mg/L)	1				0.027		
Dissolved Metals							
Aluminum (mg/L)	1				0.050		
Antimony (µg/L)	1				10.0		
Arsenic (µg/L)	1				0.3		
Cadmium (mg/L)	1				0.002		
Chromium (mg/L)	1				0.002		
Copper (mg/L)	1				0.018 ^A		1
Iron (mg/L)	1				0.036		
Lead (µg/L)	1				1.3		
Manganese (mg/L)	1				0.020		
Mercury (µg/L)	1				0.0		
Nickel (mg/L)	1				0.002		
Selenium (µg/L)	1				0.3		
Silver (mg/L)	1				0.0		
Thallium (µg/L)	1				0.7		
Zinc (mg/L)	1				0.017		
Biological							
J Chlorophyll a (mg/L)	4	< 1.00	< 1.00	0.50	0.50	0.00	
J Fecal Coliform (col/100 mL)	4	1	140	32	51	61	

A=*Fish and Wildlife* aquatic life use criterion exceeded; J=estimate; N=# samples; E=# samples that exceeded criteria; G=value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 68e.

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