

2014 Monitoring Summary

Log Creek at Pike County Road 7735 (31.93755/-85.88328)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Log Creek watershed for biological and water quality monitoring as part of the 2014 Assessment of the Southeast Alabama (SEAL) River Basin. The objectives of the SEAL Basin Assessments were to assess the biological integrity of each monitoring site to estimate overall water quality within the basin. The macroinvertebrate and habitat assessment scheduled could not be completed because of nonwadeable and turbid conditions.



Figure 1. Log Creek at LOGP-1, May 21, 2014.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin	Conecuh R	
Drainage Area (mi²)	16	
Ecoregion^a	65D	
% Landuse^b		
Open water		1%
Wetland	Woody	6%
	Emergent herbaceous	<1%
Forest	Deciduous	22%
	Evergreen	29%
	Mixed	13%
Shrub/scrub		15%
Grassland/herbaceous		3%
Pasture/hay		8%
Cultivated crops		2%
Development	Open space	2%
	Low intensity	<1%
	Moderate intensity	<1%
Population/km^{2c}	1	

^aSouthern Hilly Gulf Coastal Plain

^b2011 National Land Cover Dataset

^c2010 US Census

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Log Creek (Figure 1) is a *Fish & Wildlife (F&W)* stream located near Linwood, AL, in the Conecuh River basin. Log Creek drains 16 square miles of the Southern Hilly Gulf Coastal Plain ecoregion in Pike County. Based on the 2011 National Land Cover Dataset, landuse within the watershed is primarily forested (64%), with some shrub/scrub, pasture and wetland areas. As of April 1, 2016, there are no outfalls that are active in this watershed.

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 2. Monthly in-situ measurements and water samples were scheduled March through October 2014 to help identify any stressors to the biological communities. Samples were not collected during stagnant/no flow conditions at the site, July through October 2014.

The *F&W* human health criterion for dissolved arsenic and the *F&W* hardness-adjusted aquatic life use criterion for dissolved lead was exceeded during the April and June sampling events. Total Kjeldahl Nitrogen, total and dissolved aluminum, and dissolved iron values were greater than 90% of all verified ecoregional reference reach data collected in the Southern Hilly Gulf Coastal Plain ecoregion.

Although samples of total dissolved arsenic did exceed the human health criterion for Log Creek, the ADEM criterion for arsenic is expressed as dissolved trivalent arsenic (arsenite – As III). Presently studies are being conducted to provide a better understanding of the prevalence and areal distribution of dissolved trivalent arsenic to total arsenic in the State of Alabama. Upon conclusion of the studies, Log Creek will be reassessed for arsenic violations.

SUMMARY

The macroinvertebrate and habitat assessment scheduled to be conducted on Log Creek at LOGP-1 could not be completed because of nonwadeable and turbid conditions. Water quality samples scheduled during July through October 2014 were unable to be collected due to no stream flow. Monitoring should continue to fully assess water quality and biological conditions in Log Creek. An alternative, wadeable location should be considered for assessment of the biological community.

Table 2. Summary of water quality data collected March to October 2014. 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)	6	12.1	24.2	17.0	17.8	4.5	
Turbidity (NTU)	6	26.4	59.4	36.0	37.4	12.0	
Total Dissolved Solids (mg/L)	5	47.0	94.0	62.0	65.6	20.0	
Total Suspended Solids (mg/L)	5	12.0	23.0	16.0	16.0	4.5	
Specific Conductance (µmhos)	6	35.7	56.1	47.2	47.6	7.4	
Hardness (mg/L)	2	16.2	18.1	17.2	17.2	1.3	
Alkalinity (mg/L)	5	8.9	16.4	12.2	12.6	2.8	
Stream Flow (cfs)	5	2.8	23.9	10.6	14.1	9.2	
Chemical							
Dissolved Oxygen (mg/L)	6	6.3	9.4	8.6	8.3	1.1	
pH (su)	6	6.4	6.7	6.5	6.5	0.1	
¹ Ammonia Nitrogen (mg/L)	5	<0.006	0.049	0.012	0.019	0.019	
Nitrate+Nitrite Nitrogen (mg/L)	5	0.073	0.130	0.111	0.104	0.022	
Total Kjeldahl Nitrogen (mg/L)	5	0.264	0.889	0.682 ^M	0.638	0.228	
Total Nitrogen (mg/L)	5	0.337	0.982	0.796	0.742	0.240	
¹ Dissolved Reactive Phosphorus (mg/L)	5	0.004	0.008	0.007	0.006	0.002	
Total Phosphorus (mg/L)	5	0.039	0.065	0.042	0.048	0.011	
CBOD-5 (mg/L)	5	<2.0	<2.0	1.0	1.0	0.0	
Chlorides (mg/L)	5	3.5	4.3	3.6	3.8	0.3	
Atrazine (µg/L)	1				0.26		
Total Metals							
Aluminum (mg/L)	2	0.831	1.260	1.046 ^M	1.046	0.303	
Iron (mg/L)	2	0.320	3.550	1.935	1.935	2.284	
¹ Manganese (mg/L)	2	0.037	0.040	0.038	0.038	0.002	
Dissolved Metals							
Aluminum (mg/L)	2	<0.050	3.170	1.598 ^M	1.598	2.224	
Antimony (µg/L)	2	<0.2	<0.2	0.1	0.1	0.0	
¹ Arsenic (µg/L)	2	0.6	0.9	0.80 ^H	0.8	0.2	2
Cadmium (µg/L)	2	<0.246	<0.250	0.124	0.124	0.001	
¹ Chromium (µg/L)	2	1.100	1.695	1.398	1.398	0.421	
¹ Copper (mg/L)	2	0.001	0.001	0.001	0.001	0.000	
Iron (mg/L)	2	1.060	1.350	1.205 ^M	1.205	0.205	
Lead (µg/L)	2	0.4	0.4	0.4 ^S	0.4	0.0	2
¹ Manganese (mg/L)	2	0.019	0.030	0.024	0.024	0.008	
¹ Nickel (mg/L)	2	0.001	0.001	0.001	0.001	0.000	
Selenium (µg/L)	2	<0.4	<0.4	0.2	0.2	0.0	
Silver (µg/L)	2	<0.252	<0.252	0.126	0.126	0.000	
Thallium (µg/L)	2	<0.2	<0.2	0.1	0.1	0.0	
¹ Zinc (mg/L)	2	0.003	0.015	0.009	0.009	0.009	
Biological							
Chlorophyll a (ug/L)	5	0.10	8.01	3.56	3.75	3.09	
E. coli (col/100mL)	5	205	775	291	379	228	

E=# samples that exceeded criteria; H=F&W human health criterion exceeded; J=estimate; M=value >90% of all verified ecoregional reference reach data collected in the ecoregion 65d; N=# samples; S=F&W hardness-adjusted aquatic life use criteria exceeded.

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