

2014 Monitoring Summary



Little Uchee Creek at Lee County Road 144 (32.54901/-85.27858)

BACKGROUND

The Little Uchee Creek sub-watershed is a tributary of Uchee Creek, which was identified as a Strategic Habitat Unit (SHU) by the Alabama Rivers & Streams Network (ARSN). SHUs are recognized as high-quality habitats occupied by federally listed and state imperiled species.

The Alabama Department of Environmental Management (ADEM) selected the Little Uchee 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 collect data to fully assess chemical, physical, and biological conditions within the reach, estimate overall water quality within the basin, and support restoration efforts.



Figure 1. Little Uchee Creek at LUCL-10, June 4, 2014.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. The Little Uchee Creek is a *Fish & Wildlife (F&W)* stream, located near Salem in the Chattahoochee River basin. Based on the 2011 National Land Cover Dataset, landuse within the watershed is primarily forested areas (67%) with some pasture. As of April 2016, four outfalls are active in this watershed.

REACH CHARACTERISTICS

General observations (Table 2) and a habitat assessment (Table 3) were completed during the macroinvertebrate assessment. In comparison with reference reaches in the same ecoregion, they give an indication of the physical condition of the site and the quality and availability of habitat.

The Little Uchee Creek at LUCL-10 (Figure 1) is a riffle-run stream with a mixture of bedrock, boulder, cobble, gravel and sand substrates. Overall habitat quality was categorized as *sub-optimal*.

BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). The WMB-I uses measures of taxonomic richness, community composition, and community tolerance to assess the overall health of the macroinvertebrate community. Each metric is scored on a 100 point scale. The final score is the average of all individual metric scores. Metric results indicated the macroinvertebrate community to be in *fair* condition (Table 4).

Table 1. Summary of watershed characteristics.

Watershed Characteristics			
Basin		Chattahoochee R	
Drainage Area (mi ²)		17	
Ecoregion ^a		45B	
% Landuse ^b			
Open water		<1%	
Wetland		Woody	
		2%	
		Emergent herbaceous	
		<1%	
Forest		Deciduous	
		41%	
		Evergreen	
		25%	
		Mixed	
		1%	
Shrub/scrub		8%	
Grassland/herbaceous		6%	
Pasture/hay		12%	
Development		Open space	
		3%	
		Low intensity	
		1%	
		Moderate intensity	
		<1%	
		High intensity	
		<1%	
Barren		1%	
Population/km ^{2c}		23	
# NPDES Permits ^d		TOTAL	
		4	
Construction		3	
Small Mining		1	

a. Southern Outer Piedmont

b. 2011 National Land Cover Dataset

c. 2010 US Census

d. #NPDES outfalls downloaded from ADEM's NPDES Management System database, April 1, 2016.

Table 2. Physical characteristics of Little Uchee Creek at LUCL-10, May 21, 2014.

Physical Characteristics		
Width (ft)		45
Canopy Cover		Estimate 50/50
Depth (ft)		
	Riffle	0.5
	Run	1.5
	Pool	1.5
% of Reach		
	Riffle	30
	Run	65
	Pool	5
% Substrate		
	Bedrock	10
	Boulder	10
	Cobble	10
	Gravel	15
	Sand	45
	Silt	5
	Organic Matter	5

Table 3. Results of the habitat assessment conducted on Little Uchee Creek at LUCL-10, May 21, 2014.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	68	Sub-optimal (59-70)
Sediment Deposition	60	Sub-optimal (59-70)
Sinuosity	55	Marginal (45-64)
Bank and Vegetative Stability	55	Marginal (35-59)
Riparian Buffer	80	Sub-optimal (70-89)
Habitat Assessment Score	151	
% Maximum Score	63	Sub-optimal (59-70)

Table 4. Results of the macroinvertebrate bioassessment conducted in the Little Uchee Creek at LUCL-10, May 21, 2014.

Macroinvertebrate Assessment		Results
Taxa richness and diversity measures		
Total # Taxa		66
# EPT taxa		16
Shannon Diversity		3.51
# Highly-sensitive and Specialized Taxa		1
Taxonomic composition measures		
% EPT minus Baetidae and Hydropsychidae		9
% Non-insect taxa		9
Tolerance measures		
# Sensitive EPT		5
% Sensitive taxa		21
% Tolerant taxa		74
WMB-I Assessment Score		4
WMB-I Assessment Rating		Fair

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected during March through October of 2014 to help identify any stressors to the biological communities.

Specific conductance and hardness values were higher than the median concentration of all verified ecoregional reference reach data collected in ecoregion 45b. Alkalinity, total and dissolved iron and manganese values were greater than 90% of all verified ecoregional reference reach data collected in the Piedmont ecoregion.

SUMMARY

Bioassessment results indicated the macroinvertebrate community to be in *fair* condition. Overall habitat quality was categorized as *sub-optimal*. Some water quality results were elevated as compared to data from ADEM's least-impaired reference reaches in ecoregion 45. Monitoring should continue to ensure that conditions remain stable.

Table 5. Summary of water quality data collected March through 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
Physical						
Temperature (°C)	9	14.4	25.3	20.6	20.6	3.9
Turbidity (NTU)	8	7.3	19.3	13.8	13.4	4.5
Total Dissolved Solids (mg/L)	8	30.0	98.0	71.5	68.8	19.6
Total Suspended Solids (mg/L)	8	<1.0	7.0	4.5	4.2	2.1
Specific Conductance (µmhos)	9	56.2	89.1	78.4 ^G	75.2	12.1
Hardness (mg/L)	4	15.9	28.6	26.0 ^G	24.1	5.9
Alkalinity (mg/L)	8	23.0	40.9	36.8 ^M	34.2	6.8
Stream Flow (cfs)	8	0.4	12.3	5.0	4.7	4.1
Chemical						
Dissolved Oxygen (mg/L)	9	6.1	9.8	7.8	7.9	1.2
pH (su)	9	6.8	7.1	7.0	7.0	0.1
Ammonia Nitrogen (mg/L)	8	<0.006	0.087	0.004	0.019	0.029
Nitrate+Nitrite Nitrogen (mg/L)	8	0.031	0.153	0.078	0.086	0.047
Total Kjeldahl Nitrogen (mg/L)	8	<0.049	0.380	0.276	0.258	0.106
Total Nitrogen (mg/L)	8	<0.070	0.484	0.364	0.343	0.136
¹Dissolved Reactive Phosphorus (mg/L)	8	0.006	0.012	0.009	0.009	0.002
Total Phosphorus (mg/L)	8	0.025	0.037	0.030	0.031	0.004
CBOD-5 (mg/L)	8	<2.0	<2.0	1.0	1.0	0.0
Chlorides (mg/L)	8	2.6	3.2	2.8	2.8	0.2
Total Metals						
¹Aluminum (mg/L)	4	<0.050	0.603	0.054	0.184	0.281
Iron (mg/L)	4	1.090	2.190	1.680 ^M	1.660	0.516
Manganese (mg/L)	4	0.113	0.282	0.249 ^M	0.223	0.078
Dissolved Metals						
¹Aluminum (mg/L)	4	<0.050	0.177	0.025	0.063	0.076
Antimony (µg/L)	4	<0.2	<0.3	0.1	0.1	0.0
¹Arsenic (µg/L)	4	<0.2	0.3	0.1	0.2	0.1
Cadmium (µg/L)	4	<0.246	<0.311	0.124	0.132	0.016
¹Chromium (µg/L)	4	<0.347	0.660	0.528	0.472	0.214
¹Copper (mg/L)	4	<0.0002	0.0009	0.0004	0.0004	0.0002
Iron (mg/L)	4	0.838	1.510	0.941 ^M	1.058	0.306
Lead (µg/L)	4	<0.2	<0.4	0.1	0.1	0.0
Manganese (mg/L)	4	0.072	0.270	0.222 ^M	0.196	0.087
¹Nickel (mg/L)	4	<0.0002	0.0002	0.0002	0.0003	0.0001
Selenium (µg/L)	4	<0.4	<0.4	0.2	0.2	0.0
Silver (µg/L)	4	<0.252	<0.365	0.126	0.140	0.028
Thallium (µg/L)	4	<0.2	<0.5	0.1	0.2	0.1
¹Zinc (mg/L)	4	0.002	0.010	0.003	0.005	0.003
Biological						
Chlorophyll a (ug/L)	8	<0.10	11.21	1.34	2.77	3.71
E. coli (col/100mL)	8	16	613	135	221	209

E=# samples that exceeded criteria; G=value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 45; J=estimate; M=value >90% of all verified ecoregional reference reach data collected in the ecoregion 45; N=# samples.

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