

2014 Monitoring Summary



Little Uchee Creek at Russell County Road 28 (32.41072/-85.10683)

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 LUCR-2, June 3, 2014.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		Chattahoochee R
Basin		
Drainage Area (mi ²)		113
Ecoregion ^a		65I
% Landuse^b		
Open water		1%
Wetland	Woody	3%
	Emergent herbaceous	<1%
Forest	Deciduous	31%
	Evergreen	20%
	Mixed	4%
Shrub/scrub		12%
Grassland/herbaceous		4%
Pasture/hay		10%
Cultivated crops		2%
Development	Open space	7%
	Low intensity	4%
	Moderate intensity	<1%
	High intensity	<1%
Barren		<1%
Population/km ^{2c}		62
# NPDES Permits^d		
	TOTAL	45
	Construction	33
	Industrial General	5
	Mining	6
	Small Mining	1

a. Fall Line Hills

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 LUCR-2, July 29, 2014.

Physical Characteristics	
Width (ft)	40
Canopy Cover	Mostly Open
Depth (ft)	
	Run 0.5
	Pool 3.0
% of Reach	
	Run 60
	Pool 40
% Substrate	
	Mud/Muck 5
	Gravel 10
	Hard Pan Clay 10
	Sand 60
	Organic Matter 15

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Little Uchee Creek is a *Fish & Wildlife (F&W)* stream located in the Fall Line Hills (65i) ecoregion. Based on the 2011 National Land Cover Dataset, landuse within the watershed is predominantly forest (55%) with some shrub/scrub and pasture/hay areas. As of April 1, 2016, 45 NPDES outfalls were present within this watershed.

REACH CHARACTERISTICS

General observations (Table 2) and a habitat assessment (Table 3) were completed during the fish community 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. Little Uchee Creek at LUCR-2 is a glide-pool stream with substrate composed primarily of sand (Figure 1). Overall habitat quality and availability was rated as *sub-optimal* for supporting diverse aquatic communities.

BIOASSESSMENT RESULTS

The fish community in Little Uchee Creek at LUCR-2 was sampled using Alabama's Fish Community Index of Biotic Integrity (AL-IBI), developed through a multi-agency (GSA, ADCNR, ADEM) project to establish a comprehensive fish community bioassessment tool for Wadeable streams and rivers across the State. The data collected during this survey were used to score the overall health of the fish community, based on conditions expected for Wadeable streams and rivers in the *Hills and Coastal Terraces* Ichthyoregion. Measures of species richness and diversity, tolerance/intolerance, and abundance, condition, and reproduction are used to score each site from 1, or *natural*, to 6, or *highly altered*. Little Uchee Creek at LUCR-2 was given a score of 4, and was rated as *fair* (Table 4).

Table 3. Results of the habitat assessment conducted in Little Uchee Creek at LUCR-2, Jul 29, 2014.

Habitat Assessment	% Max Score	Rating
Instream Habitat Quality	47	Marginal (31-<55)
Sediment Deposition	53	Marginal (31-<55)
Sinuosity	55	Sub-Optimal (55-79)
Bank Vegetative Stability	58	Marginal (31-<58)
Riparian Buffer	79	Sub-Optimal (60-84)
Habitat Assessment Score	104	
% of Maximum Score	58	Sub-Optimal (57-80)

Table 4. Results of the fish community bioassessment conducted in Little Uchee Creek at LUCR-2, July 29, 2014.

Fish Community Assessment		
	Results	Score
Species Richness & Diversity		
Total native species	25	3
Number cyprinid species	5	1
Number sucker species	1	1
Number of Lepomis species	6	1
Number of darter+madtom species	3	1
Tolerance & Intolerance Measures		
Percent of dominant species	20.6	3
Percent of tolerant species	8.96	5
Percent Lepomis	16.42	3
Trophic Measures		
Percent insectivorous cyprinids	53.13	3
Percent top carnivores	1.79	3
Abundance, Condition & Reproductive Measures		
Percent DELT+hybrids	0	5
Percent simple lithophils	51.34	5
IBI Assessment Score		4
Condition		Fair

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected monthly March through October of 2014 to help identify any stressors to the biological communities. For Little Uchee Creek at LUCR-2, the *F&W* water quality criterion for lead was exceeded during one sampling event. The *F&W* criterion for temperature was also exceeded during an extreme low flow event.

SUMMARY

The overall habitat quality for Little Uchee Creek at LUCR-2 was categorized as *sub-optimal* for this stream type. Bioassessment results indicated the fish community to be in *fair* condition. Results from this report will be used to assess Little Uchee Creek for the 2016 Integrated Water Quality Report.

Table 5. Summary of water quality data collected March-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	Median	Avg	SD	E	Q
Physical								
Temperature (°C)	10	16.0	30.3 ^C	24.4	23.5	5.4	1	
Turbidity (NTU)	10	2.4	28.5	10.3	12.2	8.7		
Total Dissolved Solids (mg/L)	8	38.0	86.0	50.0	52.9	14.9		
Total Suspended Solids (mg/L)	8	1.0	20.0	5.5	6.8	5.9		
Specific Conductance (µmhos)	10	39.4	91.3	55.4	59.2	16.2		
Hardness (mg/L)	4	10.7	21.6	17.7	16.9	5.0		
Alkalinity (mg/L)	8	11.4	29.0	23.1	21.6	7.0		
Monthly Stream Flow (cfs)		0.7	299.0	29.2	74.3	102.9		
Stream Flow @ Sample Collection (cfs)		0.7	299.0	29.2	74.3	102.9		
Chemical								
Dissolved Oxygen (mg/L)	10	6.6	9.6	9.1	8.7	0.9		
pH (su)	10	6.7	7.8	7.0	7.1	0.4		
Ammonia Nitrogen (mg/L)	8	< 0.006	0.020	0.003	0.005	0.006		
^J Nitrate+Nitrite Nitrogen (mg/L)	8	0.013	0.085	0.050	0.050	0.024		
Total Kjeldahl Nitrogen (mg/L)	8	0.207	0.404	0.300	0.306	0.073		
^J Total Nitrogen (mg/L)	8	0.220	0.471	0.340	0.356	0.089		
^J Dissolved Reactive Phosphorus (mg/L)	8	0.004	0.005	0.004	0.004	0.000		
^J Total Phosphorus (mg/L)	8	0.009	0.045	0.018	0.022	0.013		
CBOD-5 (mg/L)	8	< 2.0	3.0	1.0	1.2	0.7		
COD (mg/L)	7	< 1.6	16.2	13.1	10.2	6.0		
TOC (mg/L)	8	3.8	4.8	4.2	4.2	0.4		
Chlorides (mg/L)	8	3.2	7.9	4.0	4.3	1.5		
Atrazine (µg/L)	1				0.3			
Total Metals								
Aluminum (mg/L)	4	< 0.050	0.782	0.128	0.266	0.358		
Iron (mg/L)	4	0.412	1.740	1.194	1.135	0.604		
Manganese (mg/L)	4	0.096	0.163	0.141	0.135	0.028		
Dissolved Metals								
Aluminum (mg/L)	4	< 0.050	0.274	0.025	0.087	0.124		
Antimony (µg/L)	4	< 0.2	< 0.4	0.1	0.1	0.1		
Arsenic (µg/L)	4	< 0.2	0.3 ^H	0.1	0.2	0.1	1	
Cadmium (mg/L)	4	< 0.246	< 0.390	0.124	0.142	0.036		
Chromium (mg/L)	4	< 0.430	1.368	0.505	0.648	0.500		
Copper (mg/L)	4	0.000	0.001	0.001	0.001	0.000		
Iron (mg/L)	4	0.345	1.140	0.628	0.685	0.332		
Lead (µg/L)	4	< 0.2	< 0.5 ^S	0.3	0.3	0.1	1	
Manganese (mg/L)	4	< 0.006	0.160	0.097	0.089	0.072		
Nickel (mg/L)	4	< 0.0002	0.0006	0.0004	0.0003	0.0002		
Selenium (µg/L)	4	< 0.4	< 0.5	0.2	0.2	0.0		
Silver (µg/L)	4	< 0.252	< 0.460	0.126	0.152	0.052		
Thallium (µg/L)	4	< 0.2	< 0.6	0.1	0.2	0.1		
Zinc (mg/L)	4	0.003	0.013	0.003	0.005	0.005		
Biological								
Chlorophyll a (µg/L)	8	< 0.10	4.27	1.07	1.12	1.38		
E. coli (col/100mL)	8	18	249	77	82	72		

C = *F&W* criterion violated; E = # samples that exceeded criteria; H = *F&W* human health criterion exceeded; J = estimate; N = # of samples; Q = # of uncertain exceedances; S = *F&W* hardness-adjusted aquatic life use criterion exceeded.

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