

2014 Monitoring Summary



Huckleberry Creek at Coffee County Road 117 (31.55550/-85.81868)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Huckleberry 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 River Basin Assessments were to assess the biological integrity of each monitoring site and to estimate overall water quality within the SEAL River basin group. A habitat and a macroinvertebrate assessment were conducted at Huckleberry Creek at HUCC-1 on May 13, 2014.



Figure 1. Huckleberry Creek at HUCC-1, May 13, 2014.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Huckleberry Creek at HUCC-1 is a *Fish & Wildlife (F&W)* stream located in north-eastern Coffee County. According to the 2011 National Land Cover Dataset, land use within the watershed is primarily forest (62%) and shrub/scrub. As of April 1, 2016, there were no NPDES outfalls active in the area.

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. Huckleberry Creek at HUCC-1 is a glide-pool stream located in the Southern Hilly Gulf Coastal Plain ecoregion (Figure 1). Bottom substrate consists primarily of sand. Overall habitat quality was rated as *sub-optimal* for supporting a diverse aquatic macroinvertebrate community.

BIOASSESSMENT RESULTS

The benthic macroinvertebrate community was sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). Measures of taxonomic richness, community composition, and community tolerance were used to assess the overall health of the macroinvertebrate community in comparison to conditions expected in south Alabama streams and rivers. Each site is placed in one of six levels, ranging from 1, or *natural*, to 6, or *highly altered*. The macroinvertebrate survey conducted at HUCC-1 rated the site as a 4-, or *Fair/Poor*. Relative abundance and numbers of pollution-sensitive taxa are lower than expected, and a few taxa appear to dominate the macroinvertebrate community (Table 4).

Table 1. Summary of watershed characteristics.

Watershed Characteristics		Choctawhatchee R
Basin		Choctawhatchee R
Drainage Area (mi²)		3
Ecoregion^a		65D
% Landuse^b		
	Open water	1%
	Wetland	
	Woody	1%
	Emergent herbaceous	<1%
	Forest	
	Deciduous	19%
	Evergreen	28%
	Mixed	15%
	Shrub/scrub	19%
	Grassland/herbaceous	1%
	Pasture/hay	6%
	Cultivated crops	6%
	Development	
	Open space	3%
	Low intensity	<1%
Population/km^{2c}		8

- a. Southern Hilly Gulf Coastal Plain
- b. 2011 National Land Cover Dataset
- c. 2010 US Census

Table 2. Physical characteristics of Huckleberry Creek at HUCC-1 on May 13, 2014.

Physical Characteristics	
Width (ft)	20
Canopy Cover	Shaded
Depth (ft)	
	Run 0.3
	Pool 1.5
% of Reach	
	Run 85
	Pool 15
% Substrate	
	Sand 90
	Silt 2
	Organic Matter 8

Table 3. Results of the habitat assessment conducted on Huckleberry Creek at HUCC-1, May 13, 2014.

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	30	Poor (<31)
Sediment Deposition	63	Sub-Optimal (55-79)
Sinuosity	73	Sub-Optimal (55-79)
Bank Vegetative Stability	55	Marginal (31-<58)
Riparian Buffer	93	Optimal (>84)
Habitat Assessment Score	104	
% Maximum Score	61	Sub-Optimal (57-80)

Table 4. Results of the macroinvertebrate bioassessment conducted in Huckleberry Creek at HUCC-1, May 13, 2014.

Macroinvertebrate Assessment		Results
Taxa richness and diversity measures		
	Total # Taxa	30
	# EPT taxa	5
	# Highly-sensitive and Specialized Taxa	0
Taxonomic composition measures		
	% EPC taxa	27
	% EPT minus Baetidae and Hydropsychidae	10
	% Chironomidae Individuals	74
	% Dominant Taxon	28
	% Individuals in Dominant 5 Taxa	72
Functional feeding group		
	# Collector Taxa	13
	% Tolerant Filterer Taxa	7
Community tolerance		
	# Sensitive EPT	1
	% Sensitive taxa	13
	% Nutrient Tolerant individuals	31
	WMB-I Assessment Score	4-
	WMB-I Assessment Rating	Fair/Poor

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected March through October of 2014 to help identify any stressors to the biological community. Organics were sampled at the stream on April 17, 2014. Atrazine was above the minimum detection limit (MDL) at the time of sampling. *E. coli* counts exceeded single sample human health criteria guidelines in three of the four samples collected in the summer months. These samples were collected in June, July, and August and do not appear to be flow-related. All parameters were within range of the ecoregional guidelines for the Southern Hilly Gulf Coastal Plain ecoregion (65d).

SUMMARY

While the habitat assessment conducted in Huckleberry Creek at HUCC-1 indicated the reach to be *sub-optimal* for supporting a diverse biological community, bioassessment results indicated the macroinvertebrate community in the reach to be in *fair/poor* condition. Results of water chemistry analyses showed that atrazine concentrations were above the MDL in one sample collected in April. Three of the four *E. coli* samples collected in the summer exceeded single sample human health criterion. Monitoring should continue to ensure that conditions in the stream reach continue to meet current standards.

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	Med	Avg	SD	E	Q
Physical								
Temperature (°C)	10	14.1	25.2	20.0	19.6	4.2		
Turbidity (NTU)	10	12.2	30.5	16.9	17.1	5.2		
Total Dissolved Solids (mg/L)	8	29.0	64.0	50.5	47.8	11.9		
Total Suspended Solids (mg/L)	8	5.0	31.0	13.5	14.1	8.2		
Specific Conductance (µmhos/cm@25C)	10	33.5	62.6	44.6	45.4	9.6		
Hardness (mg/L)	4	10.2	22.8	15.4	16.0	5.5		
^J Alkalinity (mg/L)	8	5.7	24.3	12.6	13.2	6.0		
Monthly Stream Flow (cfs)	8	0.1	7.7	2.5	2.8	2.6		
Stream Flow during Sample Collection (cfs)	7	0.2	7.7	3.0	3.2	2.5		
Chemical								
Dissolved Oxygen (mg/L)	9	7.8	10.2	8.9	8.9	0.9		
pH (su)	10	6.7	7.4	6.9	7.0	0.2		
^J Ammonia Nitrogen (mg/L)	8	< 0.006	0.150	0.004	0.026	0.051		
Nitrate+Nitrite Nitrogen (mg/L)	8	0.133	0.370	0.252	0.246	0.087		
Total Kjeldahl Nitrogen (mg/L)	8	0.193	0.942	0.380	0.422	0.245		
Total Nitrogen	8	0.331	1.231	0.646	0.668	0.305		
^J Dissolved Reactive Phosphorus (mg/L)	8	< 0.003	0.007	0.004	0.004	0.002		
Total Phosphorus (mg/L)	8	0.011	0.019	0.016	0.015	0.003		
^J CBOD-5 (mg/L)	8	< 2.0	< 2.0	1.0	1.0	0.0		
Chlorides (mg/L)	8	2.8	4.4	4.0	3.9	0.5		
Atrazine (µg/L)	1				0.16			
Total Metals								
^J Aluminum (mg/L)	4	0.124	0.453	0.247	0.268	0.148		
Iron (mg/L)	4	1.330	1.640	1.515	1.500	0.145		
^J Manganese (mg/L)	4	0.030	0.078	0.042	0.048	0.021		
Dissolved Metals								
Aluminum (mg/L)	4	< 0.050	< 0.050	0.025	0.025	0.000		
Antimony (µg/L)	4	< 0.2	< 0.4	0.1	0.1	0.1		
^J Arsenic (µg/L)	4	0.4	0.8 ^H	0.6	0.6	0.2		4
Cadmium (µg/L)	4	< 0.246	< 0.390	0.123	0.141	0.036		
^J Chromium (mg/L)	4	0.001	0.001	0.001	0.001	0.000		
^J Copper (mg/L)	4	< 0.0003	0.0004	0.0003	0.0003	0.0001		
Iron (mg/L)	4	0.296	0.836	0.453	0.510	0.241		
Lead (µg/L)	4	< 0.2	< 0.5	0.1	0.2	0.1		
^J Manganese (mg/L)	4	0.022	0.066	0.034	0.039	0.019		
^J Nickel (mg/L)	4	0.001	0.001	0.001	0.001	0.000		
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		
^J Zinc (mg/L)	4	0.004	0.004	0.004	0.004	0.000		
Biological								
Chlorophyll a (ug/L)	8	< 0.10	2.14	1.07	0.91	0.79		
^J E. coli (MPN/DL)	8	384	2420 ^H	750	934	689	3	

E=# samples that exceeded criteria; H=F&W human health criterion exceeded; J=estimate; N= # of samples; Q=# of uncertain exceedances.

FOR MORE INFORMATION, CONTACT:
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