

2010 Monitoring Summary



Sougahatchee Creek at Tallapoosa County Road 45 (32.64020/-85.84460)

BACKGROUND

Sougahatchee Creek at SOGL-6 was selected as a site for nutrient criteria development in the Tallapoosa River Basin in 2010. Data collected will be used to develop and implement nutrient criteria in wadeable, flowing streams in the Tallapoosa River Basin, as well as statewide.



Figure 1. Sougahatchee Creek at SOGL-6, April 7, 2010.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Sougahatchee Creek is a *Public Water Supply (PWS)/Fish & Wildlife (F&W)* stream located near Tallassee in the Tallapoosa River basin. Based on the 2000 National Land Cover Dataset, landuse within the watershed is primarily forest (66%), with some pasture and grassland (19%). Less than 10% of the watershed is developed. As of February 23, 2011, 383 outfalls are active in this watershed.

Table 2. Physical characteristics of Sougahatchee Creek at SOGL-6, June 9, 2010.

Physical Characteristics		
Width (ft)	84	
Canopy Cover	Open	
Depth (ft)	Run	1.5
	Pool	2.0
% of Reach	Run	90
	Pool	10
% Substrate	Bedrock	2
	Boulder	1
	Mud/Muck	2
	Gravel	8
	Sand	77
	Silt	2
	Organic Matter	8

Table 1. Summary of watershed characteristics.

Watershed Characteristics		Tallapoosa River
Basin		Tallapoosa River
Drainage Area (mi ²)		210
Ecoregion ^a		45b
% Landuse		
Open water		1
Wetland	Woody	2
	Emergent herbaceous	<1
	Deciduous	37
Forest	Evergreen	27
	Mixed	2
Shrub/scrub		2
Grassland/herbaceous		8
Pasture/hay		11
Cultivated crops		1
Development	Open space	5
	Low intensity	3
	Moderate intensity	1
	High intensity	<1
Barren		1
Population/km ^{2b}		57
# NPDES Permits ^c	TOTAL	383
	401 Water Quality Certification	6
	Construction Stormwater	355
	Mining	2
	Industrial General	7
	Industrial Individual	3
	Municipal Individual	7
	Underground Injection Control	3

a. Southern Outer Piedmont

b. 2000 US Census

c. #NPDES outfalls downloaded from ADEM's NPDES Management System database, February 23, 2011

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. Sougahatchee Creek at SOGL-6 is a low-gradient, glide-pool stream located in the Southern Outer Piedmont ecoregion (Figure 1). Benthic substrate consists primarily of sand. Overall habitat quality was categorized as *sub-optimal* for supporting a diverse aquatic macroinvertebrate community.

BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). Measures of taxonomic richness, community composition, and community tolerance are used to assess the overall health of the macroinvertebrate community in comparison to conditions expected in north 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 in Sougahatchee Creek at SOGL-6 rated the site as *fair*. Relative abundance and numbers of pollution-sensitive taxa are lower than expected, while relative abundance and numbers of pollution-tolerant taxa have increased (Table 4).

Table 3. Results of the habitat assessment conducted on Sougahatchee Creek at SOGL-6, June 9, 2010.

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	38	Poor (<41)
Sediment Deposition	69	Sub-optimal (59-70)
Sinuosity	35	Poor (<45)
Bank and Vegetative Stability	60	Sub-optimal (60-74)
Riparian Buffer	83	Sub-optimal (70-89)
Habitat Assessment Score	130	
% Maximum Score	59	Sub-optimal (59-70)

Table 4. Results of the macroinvertebrate bioassessment conducted in Sougahatchee Creek at SOGL-6, June 9, 2010.

Macroinvertebrate Assessment		Results
Taxa richness and diversity measures		
Total # Taxa		61
# EPT taxa		15
Shannon Diversity		2.93
# Highly-sensitive and Specialized Taxa		3
Taxonomic composition measures		
% EPT minus Baetidae and Hydropsychidae		12
% Non-insect taxa		7
Tolerance measures		
# Sensitive EPT		13
% Sensitive taxa		40
% Tolerant taxa		22
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 monthly, semi-monthly, or quarterly (pesticides, atrazine, and semi-volatile organics) during April through November of 2010 to help identify any stressors to the biological communities. Median conductivity, alkalinity, nutrient concentrations (nitrate-nitrite-nitrogen and total nitrogen), and chlorides were higher than expected for streams in the Southern Outer Piedmont ecoregion. Metals were not sampled at this stream reach.

SUMMARY

Bioassessment results indicated the macroinvertebrate community in Sougahatchee Creek at SOGL-6 to be in *fair* condition. Habitat quality was categorized as *sub-optimal* for supporting macroinvertebrate communities. Water quality data collected in 2010 suggest that elevated conductivity, alkalinity, nutrient levels, and chlorides may pose a potential concern for the biological communities of the reach. Data collected at this site may be useful in establishing nutrient criteria for streams in the Tallapoosa River Basin and statewide.

Table 5. Summary of water quality data collected April-November, 2010. 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	14.5	28.8	23.0	22.2	5.0
Turbidity (NTU)	9	3.0	25.9	8.5	11.6	8.4
Total Dissolved Solids (mg/L)	8	36.0	94.0	70.0	70.0	17.4
Total Suspended Solids (mg/L)	8	< 1.0	22.0	4.0	6.9	8.0
Specific Conductance (µmhos)	9	66.2	135.9	97.3 ^G	95.0	25.4
Alkalinity (mg/L)	8	25.1	40.0	33.2 ^M	32.0	5.3
Stream Flow (cfs)	6	21.5	151.9	75.0	78.6	53.4
Chemical						
Dissolved Oxygen (mg/L)	9	7.0	9.6	8.7	8.5	0.9
pH (su)	9	6.8	7.6	7.2	7.3	0.2
Ammonia Nitrogen (mg/L)	8	< 0.021	< 0.021	0.010	0.010	0.000
Nitrate+Nitrite Nitrogen (mg/L)	8	0.283	2.440	0.574 ^M	0.779	0.714
Total Kjeldahl Nitrogen (mg/L)	8	0.162	0.548	0.218	0.254	0.124
Total Nitrogen (mg/L)	8	0.531	2.988	0.782 ^M	1.032	0.818
^J Dissolved Reactive Phosphorus (mg/L)	8	0.009	0.066	0.021	0.025	0.018
Total Phosphorus (mg/L)	8	0.016	0.099	0.026	0.037	0.028
CBOD-5 (mg/L)	8	< 2.0	2.8	1.0	1.4	0.7
Chlorides (mg/L)	8	2.9	10.6	6.4 ^M	6.4	3.1
Biological						
Chlorophyll a (ug/L)	8	< 0.10	5.93	1.20	1.59	1.82

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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