

# 2010 Monitoring Summary



## Sougahatchee Creek at AL Hwy 49 in Tallapoosa County (32.63180/-85.79830)

### BACKGROUND

Sougahatchee Creek at SOGL-5 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 streams in the Tallapoosa River Basin, as well as statewide.

A macroinvertebrate assessment was conducted at SOGL-5 on July 6, 2010, using ADEM's non-wadeable sampling protocols. No habitat assessment was completed at this site.



Figure 1. Sougahatchee Creek at SOGL-5, July 20, 2010.

### WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Sougahatchee Creek at SOGL-5 is a *Fish & Wildlife (F&W)* stream located in Tallapoosa County (Figure 1). It is located within the Southern Outer Piedmont ecoregion. Based on the 2000 National Land Cover Dataset, landuse within the watershed is primarily forest (66%) and pasture and grassland (19%). Less than 10% of the watershed is developed. As of February 23, 2011, 381 outfalls are active in this watershed.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		Tallapoosa River
<b>Basin</b>		Tallapoosa River
<b>Drainage Area (mi<sup>2</sup>)</b>		194
<b>Ecoregion<sup>a</sup></b>		45b
<b>% Landuse</b>		
Open water		1
Wetland	Woody	2
	Emergent herbaceous	<1
Forest	Deciduous	37
	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
<b>Population/km<sup>2b</sup></b>		61
<b># NPDES Permits<sup>c</sup></b>	<b>TOTAL</b>	381
	401 Water Quality Certification	6
	Construction Stormwater	353
	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

### BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Nonwadeable Intensive Multi-habitat Bioassessment methodology (NWMB-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-5 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 2).

### WATER CHEMISTRY

Results of water chemistry are presented in Table 3. In situ measurements and water samples were collected monthly during April through November of 2010 to help identify any stressors to the biological communities. Parameters measured focused primarily on indicators of nutrient enrichment. Median specific conductance was higher than background levels based on data from established reference reaches in the Piedmont ecoregion. Median alkalinity, nutrient concentrations (nitrate-nitrite-nitrogen, total nitrogen, and dissolved reactive phosphorus), and chlorides were also higher than expected for the area. No metals were collected at this site.

**Table 2.** Results of macroinvertebrate assessment conducted in Sougahatchee Creek at SOGL-5, July 6, 2010.

Macroinvertebrate Assessment		Results
<b>Taxa richness and diversity measures</b>		
Total # Taxa		61
# EPT taxa		11
Shannon Diversity		4.50
# Highly-sensitive and Specialized Taxa		3
<b>Taxonomic composition measures</b>		
% EPT minus Baetidae and Hydropsychidae		13
% Non-insect taxa		15
<b>Tolerance measures</b>		
# Sensitive EPT		13
% Sensitive taxa		40
% Tolerant taxa		41
<b>WMB-I Assessment Score</b>		<b>4</b>
<b>WMB-I Assessment Rating</b>		<b>Fair</b>

### SUMMARY

Bioassessment results indicated the aquatic macroinvertebrate community of Sougahatchee Creek at SOGL-5 to be in *fair* condition. While no habitat assessment was completed, water quality analyses conducted in 2010 suggest that elevated nutrient concentrations, conductivity, alkalinity, and chlorides may be negatively impacting the biological communities of the stream reach. Nutrient data collected at this site may provide a useful basis of comparison for other streams in the ecoregion.

**Table 3.** 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
<b>Physical</b>						
Temperature (°C)	9	14.3	29.0	23.5	22.6	5.1
Turbidity (NTU)	9	8.4	55.4	10.9	16.9	15.3
Total Dissolved Solids (mg/L)	8	24.0	96.0	68.0	65.5	22.9
Total Suspended Solids (mg/L)	8	3.0	21.0	6.0	7.8	6.0
Specific Conductance (µmhos)	9	66.6	144.7	102.4 <sup>G</sup>	98.7	25.4
Alkalinity (mg/L)	8	24.6	39.1	30.7 <sup>M</sup>	31.3	5.4
Stream Flow (cfs)	2	0.7	25.0	12.9	12.9	17.2
<b>Chemical</b>						
Dissolved Oxygen (mg/L)	9	6.6	9.6	8.4	8.2	1.2
pH (su)	9	7.1	7.6	7.4	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	0.298	1.442	0.683 <sup>M</sup>	0.794	0.440
Total Kjeldahl Nitrogen (mg/L)	8	0.189	0.344	0.247	0.256	0.045
Total Nitrogen (mg/L)	8	0.531	1.702	0.981 <sup>M</sup>	1.049	0.447
Dissolved Reactive Phosphorus (mg/L)	8	0.014	0.064	0.027 <sup>M</sup>	0.029	0.015
Total Phosphorus (mg/L)	8	0.021	0.122	0.041	0.049	0.031
CBOD-5 (mg/L)	8	< 2.0	< 2.0	1.0	1.0	0.0
Chlorides (mg/L)	8	3.0	12.9	6.3 <sup>M</sup>	6.5	3.4
<b>Biological</b>						
Chlorophyll a (ug/L)	8	< 0.10	5.34	0.78	1.34	1.80

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

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