

# 2005 Monitoring Summary

## Persimmon Creek at Macon County Road 45 (32.35733, -85.70033)

### BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Persimmon Creek watershed for biological and water quality monitoring as part of the 2005 Assessment of the Alabama, Coosa, and Tallapoosa (ACT) River Basins. Habitat and macroinvertebrate assessments are generally conducted to assess the biological integrity of each monitoring site and to estimate overall water quality within each basin group. However, Persimmon Creek at PSMM-31 was not wadeable during the site visit; habitat and macroinvertebrate assessments could not be conducted.

### WATERSHED CHARACTERISTICS

Persimmon Creek at PSMM-31 is a *Fish & Wildlife* (F&W) stream located in Macon County (Fig. 1). Landuse within the watershed is primarily forest (57%) and pasture (Table-1). There are five permitted discharges located in the watershed.

### REACH CHARACTERISTICS

Persimmon Creek at PSMM-31 is a glide/pool stream located in the Flatwoods/Blackland Prairie ecoregion (Table 1) within the Tallapoosa River watershed. Streams in this ecoregion are generally low gradient with sand or clay bottom substrates. The site was un-wadeable during six of the seven visits.

### WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 2. Samples were collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides, and semi-volatile organics) during March through October of 2005. Low flow conditions resulted in dissolved oxygen concentrations <5.0 mg/L on two of seven (28%) site visits. Fecal concentrations were >2000 col/ml during the April and July site visits due to heavy rain events just before sampling. Atrazine, dissolved iron and dissolved manganese were also above expected ranges for the Flatwoods/Blackland Prairie ecoregion.

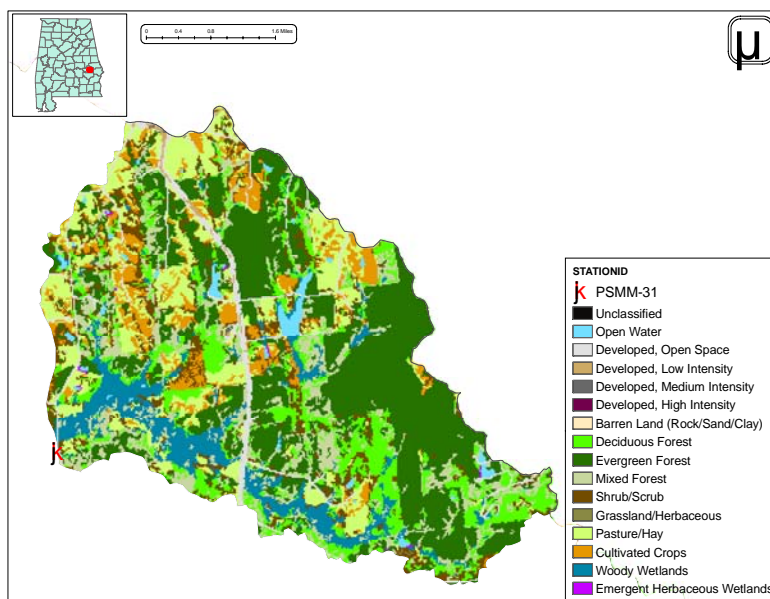
**Table 1.** Summary of Watershed Characteristics.

Watershed Characteristics		
Drainage Area (mi <sup>2</sup> )		21
Ecoregion <sup>a</sup>		65b
% Landuse		
Open water		1
Wetland	Woody	8
	Emergent herbaceous	<1
Forest	Deciduous	13
	Evergreen	32
	Mixed	12
Shrub/scrub		9
Grassland/herbaceous		<1
Pasture/hay		14
Cultivated crops		7
Development	Open space	4
	Low intensity	<1
	Moderate intensity	<1
Population/km <sup>2b</sup>		10
# NPDES Permits <sup>c</sup>	<b>TOTAL</b>	5
	Construction Stormwater	3
	Municipal Individual	2

a.Flatwood/Blackland Prairie Margins

b.2000 Census Data

c.#NPDES permits downloaded from ADEM's NPDES Management System database, 9 Jun 2008



**Figure 1.** Sampling location and landuse within the Persimmon Creek watershed at PSMM-31.

## CONCLUSIONS

Persimmon Creek at PSMM-31 was selected for biological and water quality monitoring as part of the 2005 Assessment of the ACT River Basins. However, due to unwadeable, low flow conditions, habitat and macroinvertebrate assessments could not be conducted. Fecal coliform concentrations exceeded single sampling criteria on two of the seven sampling events due to heavy rain prior to sampling. Low flow conditions may also have contributed to low dissolved oxygen concentrations. Atrazine, dissolved iron and dissolved manganese were also slightly elevated above median values expected in the Flatwoods/Blackland Prairie ecoregion.

**Table 2.** Summary of water quality data collected March-October, 2005. 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. Metals results were compared to ADEM's chronic aquatic life use criteria adjusted for hardness.

Parameter	N	Min	Max	Median	Avg	SD
<b>Physical</b>						
Temperature (°C)	7	12.0	24.0	19.0	18.6	5.1
Turbidity (NTU)	7	13.6	45.9	30.2	29.9	13.5
Total Dissolved Solids (mg/L)	7	43.0	112.0	62.0	72.3	28.0
Total Suspended Solids (mg/L)	7	11.0	39.0	29.0	26.3	11.0
Specific Conductance (µmhos)	6	30.4	92.1	52.4	54.7	21.2
Hardness (mg/L)	6	10.8	30.2	21.0	20.0	7.3
Alkalinity (mg/L)	7	5.6	34.5	13.5	16.2	9.5
<b>Chemical</b>						
Dissolved Oxygen (mg/L)	7	1.1 <sup>C</sup>	8.5	6.7	5.7	2.5
pH (su)	7	6.5	7.8	6.7	6.8	0.4
Ammonia Nitrogen (mg/L)	7	< 0.015	0.038	0.008	0.017	0.012
Nitrate+Nitrite Nitrogen (mg/L)	7	< 0.003	0.086	0.002	0.018	0.031
Total Kjeldahl Nitrogen (mg/L)	7	0.344	1.141	0.901	0.847	0.259
Total Nitrogen (mg/L)	7	0.361	1.142	0.902	0.866	0.266
Dissolved Reactive Phosphorus (mg/L)	7	0.004	0.038	0.014	0.016	0.012
Total Phosphorus (mg/L)	7	0.057	0.141	0.087	0.088	0.029
CBOD-5 (mg/L)	7	1.0	18.0	2.8	4.8	6.0
<sup>J</sup> Chlorides (mg/L)	7	3.7	7.6	5.2	5.5	1.2
Atrazine (µg/L)	2	0.06	0.06	0.06 <sup>M</sup>	0.06	---
<b>Total Metals</b>						
Aluminum (mg/L)	4	0.095	1.03	0.546	0.554	0.502
Iron (mg/L)	4	1.35	3.73	2.235	2.388	1.009
Manganese (mg/L)	4	0.07	1.07	0.378	0.474	0.430
<b>Dissolved Metals</b>						
Aluminum (mg/L)	4	< 0.015	0.314	0.081	0.121	0.146
Antimony (µg/L)	4	< 2	< 2	1	1	0.0
Arsenic (µg/L)	4	< 10	< 10	5	5	0.0
Cadmium (mg/L)	4	< 0.005	< 0.005	0.003	0.003	0.000
Chromium (mg/L)	4	< 0.004	< 0.005	0.002	0.0021	0.000
Copper (mg/L)	4	< 0.004	< 0.005	0.003	0.002	0.000
Iron (mg/L)	4	0.475	1.06	0.580 <sup>M</sup>	0.674	0.275
Lead (µg/L)	4	< 2	< 2	1	1	0.0
Manganese (mg/L)	4	0.04	0.947	0.273 <sup>M</sup>	0.383	0.400
Mercury (µg/L)	4	< 0.3	< 0.3	0.15	0.1875	0.075
Nickel (mg/L)	4	< 0.006	< 0.006	0.003	0.003	0.000
Selenium (µg/L)	4	< 10	< 10	5	5	0.0
Silver (mg/L)	4	< 0.003	< 0.003	0.002	0.002	0.000
Thallium (µg/L)	4	< 1	< 1	0.5	0.5	0.0
Zinc (mg/L)	4	< 0.006	< 0.006	0.003	0.003	0.000
<b>Biological</b>						
<sup>J</sup> Chlorophyll a (µg/L)	7	1.07	5.34	2.67	3.24	1.68
Fecal Coliform (col/100 mL)	7	10	> 3000 <sup>C</sup>	1000 <sup>M</sup>	1196	1257

J=estimate; N=# samples; Min=minimum; Max=maximum; M=value > 90% of all data within ecoregion 65a & 65b; C= Value exceeds criteria for *swimming & fish and wildlife* use classifications.

FOR MORE INFORMATION, CONTACT:  
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