

## 2005 Monitoring Summary



Basin Assessment Site

### Weoka Creek at Coosa County Road 67 crossing (32.45541/-86.36339)

#### BACKGROUND

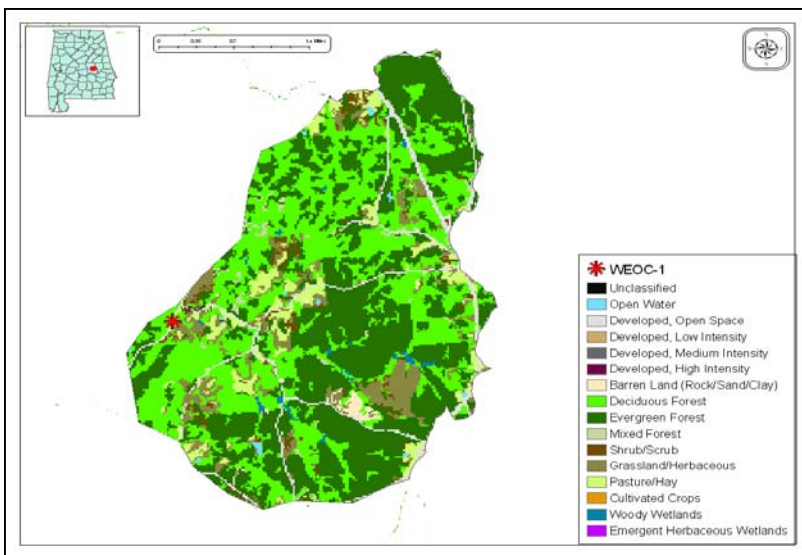
The Alabama Department of Environmental Management (ADEM) selected the Weoka Creek watershed for biological and water quality monitoring as part of the 2005 Assessment of the Alabama, Coosa, and Tallapoosa (ACT) River Basins. The objectives of the ACT Basin Assessments were to assess the biological integrity of each monitoring site and to estimate overall water quality within the ACT basin group.

**Table 1.** Summary of watershed characteristics.

Watershed Characteristics	
Drainage Area (mi <sup>2</sup> )	10
Ecoregion <sup>a</sup>	45a
% Landuse	
Forest	Deciduous 5 Evergreen 72
Shrub/scrub	4
Grassland/herbaceous	4
Pasture/hay	5
Development	Open space 10 Low intensity <1
Population/km <sup>2b</sup>	10

a.Southern Inner Piedmont

b.2000 US Census



**Figure 1.** Sampling location and land use within the Weoka Creek watershed at WEOC-1.

**Table 2.** Reach characteristics at WEOC-1 on June 24, 2005.

Physical Characteristics	
Width (ft)	15
Canopy cover	Est. 50/50
Depth (ft)	Riffle 0.2 Run 1.3 Pool 2.3
% of Reach	
	Riffle 10 Run 50 Pool 40
% Substrate	
	Bedrock 5 Cobble 10 Gravel 10 Sand 66 Silt 5 Organic Matter 4

#### WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Weoka Creek is a *Swimming Fish and Wildlife (S/F&W)* stream located near the town of Equality in the Coosa River basin (Fig. 1). Land use within the watershed is primarily forest (77%), with some pasture and open development. Weoka Creek is close to Lake Martin, Lake Jordan, and Lake Mitchell. Weoka Creek is located in the Southern Inner Piedmont (45a) ecoregion. As of June 9, 2008 this watershed has no sites that require NPDES permits.

#### REACH CHARACTERISTICS

General observations (Table 2) and habitat assessments (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. Weoka Creek at WEOC-1 is a low gradient stream characterized by sand, gravel and cobble substrates. Overall habitat quality was categorized as *marginal* due to sedimentation, bank erosion, and a lack of stable in stream habitat.

#### BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). The WMB-I uses measures of taxonomic richness, community composition, and community tolerance to assess the overall health of the macroinvertebrate community. Each metric is scored on a 100 point scale. The final score is an average of the score for each metric, indicating *fair* community condition (Table 4).

**Table 3.** Results of the habitat assessment conducted June 24, 2005.

Habitat Assessment (% Maximum Score)		Rating
Instream habitat quality	52	Marginal (41-58)
Sediment deposition	40	Poor (<41)
Sinuosity	68	Sub-optimal (65-84)
Bank and vegetative stability	34	Poor (<35)
Riparian buffer	75	Sub-optimal (70-90)
Habitat assessment score	127	
<b>% Maximum score</b>	<b>53</b>	<b>Marginal (41-58)</b>

**Table 4.** Results of the macroinvertebrate bioassessment conducted June 24, 2005.

Macroinvertebrate Assessment Results			
	Results	Scores	Rating
		(0-100)	
<b>Taxa richness measures</b>			
# Ephemeroptera (mayfly) genera	7	58	Fair (48-72)
# Plecoptera (stonefly) genera	2	33	Poor (24-48)
# Trichoptera (caddisfly) genera	8	67	Fair (48-72)
<b>Taxonomic composition measures</b>			
% Non-insect taxa	5	81	Good (72-86)
% Non-insect organisms	1	98	Excellent (>86)
% Plecoptera	2	10	Very Poor (<24)
<b>Tolerance measures</b>			
Beck's community tolerance index	13	46	Poor (24-48)
<b>WMB-I Assessment Score</b>	<b>---</b>	<b>56</b>	<b>Fair (48-72)</b>

## WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides (atrazine), and semi-volatile organics) during March through October of 2005 to help identify any stressors to the biological communities. Median concentrations of nutrients, total and dissolved solids, chlorides, hardness, alkalinity and specific conductance were within ranges expected in the Southern Inner Piedmont, based on the 90th percentile of reference data collected in ecoregion 45a.

## CONCLUSION

Bioassessment results indicated the macroinvertebrate community to be in *fair* condition. Overall habitat quality was categorized as *marginal* due to sedimentation, bank erosion, and a lack of stable in stream habitat.

**Table 5.** 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.

Parameter	N	Min	Max	Median	Avg	SD
<b>Physical</b>						
Temperature (°C)	8	11.0	26.3	20.5	19.7	5.4
Turbidity (NTU)	8	8.1	101.0	12.5	25.5	31.5
Total Dissolved Solids (mg/L)	7	13.0	94.0	37.0	42.0	30.1
Total Suspended Solids (mg/L)	7	4.0	68.0	21.5 <sup>M</sup>	25.5	22.7
Specific Conductance (µmhos)	8	33.2	46.9	44.3	42.0	5.2
Hardness (mg/L)	5	8.5	13.2	10.7	10.7	2.0
Alkalinity (mg/L)	7	8.5	16.6	13.5	12.5	3.1
Stream Flow (cfs)	6	3.3	58.7	12.7	18.6	---
<b>Chemical</b>						
Dissolved Oxygen (mg/L)	8	7.6	10	9.0	8.9	0.8
pH (su)	8	6.4	8.2	7.0	7.1	0.6
Ammonia Nitrogen (mg/L)	7	< 0.015	< 0.015	0.008	0.008	0.000
Nitrate+Nitrite Nitrogen (mg/L)	7	< 0.003	0.065	0.039	0.034	0.021
Total Kjeldahl Nitrogen (mg/L)	7	< 0.150	0.462	0.075	0.150	0.147
Total Nitrogen (mg/L)	7	0.076	0.501	0.125	0.184	0.151
Dissolved Reactive Phosphorus (mg/L)	7	< 0.004	0.052	0.007	0.014	0.019
Total Phosphorus (mg/L)	7	0.006	0.068	0.047	0.044	0.022
CBOD-5 (mg/L)	7	< 1.0	2.7	1.7	1.6	0.7
<sup>J</sup> Chlorides (mg/L)	6	4.2	5.0	4.3	4.4	0.3
Atrazine (µg/L)	2	< 0.05	< 0.05	0.03	0.03	---
<b>Total Metals</b>						
Aluminum (mg/L)	4	< 0.015	0.413	0.195	0.229	0.170
Iron (mg/L)	4	0.667	0.936	0.921	0.896	0.057
Manganese (mg/L)	4	< 0.005	0.034	0.024	0.020	0.016
<b>Dissolved Metals</b>						
Aluminum (mg/L)	4	< 0.015	< 0.015	0.008	0.008	0.000
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	< 0.004	0.002	0.002	0.000
Copper (mg/L)	4	< 0.005	< 0.005	0.003	0.003	0.000
Iron (mg/L)	4	0.099	0.236	0.104	0.146	0.078
Lead (µg/L)	4	< 2	< 2	1	1	0.0
Manganese (mg/L)	4	< 0.005	0.023	0.003	0.009	0.012
<sup>J</sup> Mercury (µg/L)	4	< 0.3	< 0.3	0.15	0.2	0.087
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)	6	0.53	12.46	1.07	3.45	5.11
<sup>J</sup> Fecal Coliform (col/100 mL)	7	97	1900	165	446	714

<sup>J</sup> = estimate; N = # samples; M = value > 90th percentile of all data collected within eco-region 45a

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