Alabama Department of Environmental Management

Basin Assessment

Rivers and Streams Monitoring Program

2010 Monitoring Summary

Good

Oakachoy Creek at Highway 259 crossing in Coosa County (32.83413/-86.04025)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected Oakachoy Creek watershed for biological and water quality monitoring as part of the 2010 Alabama, Coosa, Tallapoosa (ACT) Basin Assessment project. The objectives of this project were to assess the biological integrity of each monitoring site and to estimate overall water quality within the ACT basin.

Figure 1. Oakachoy Creek at OAKC-1, March 17, 2010.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Tallapoosa River
Drainage Area (mi^2)		17
Ecoregion[a]		45a
% Landuse		
Open water		<1
Wetland	Woody	1
Forest	Deciduous	45
	Evergreen	34
	Mixed	1
Shrub/scrub		1
Grassland/herbaceous		7
Pasture/hay		4
Cultivated crops		<1
Development	Open space	4
	Low intensity	<1
Barren		2
Population/km^2[b]		1
# NPDES Permits[c]	**TOTAL**	3
Construction Stormwater		1
Mining		1
Industrial General		1

a. Southern Inner Piedmont
b. 2000 US Census
c. #NPDES permits downloaded from ADEM's NPDES Management System database, September 1, 2012.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Oakachoy Creek is a *Fish & Wildlife (F&W)* stream that is a tributary to Lake Martin Reservoir. Based on the 2006 National Land Cover Dataset, landuse within the watershed is primarily forest (80%). Population is low in the area. As of September 1, 2012, ADEM's NPDES Management System database shows a total of three permitted discharges within the watershed.

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.

Oakachoy Creek at OAKC-1 is a riffle-run stream with a bottom substrate dominated by sand (Figure 1). Habitat quality and availability were rated as *sub-optimal* for supporting diverse aquatic macroinvertebrate communities.

Table 2. Physical characteristics of Oakachoy Creek at OAKC-1, May 18, 2010.

Physical Characteristics		
Width (ft)		35
Canopy Cover		Estimate 50/50
Depth (ft)		
	Riffle	0.5
	Run	1.3
	Pool	2.5
% of Reach		
	Riffle	15
	Run	80
	Pool	5
% Substrate		
	Boulder	15
	Clay	1
	Cobble	3
	Gravel	10
	Sand	62
	Silt	3
	Organic Matter	6

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 in comparison to least-impaired reference reaches in the same ecoregion. The final score is the average of all individual metric scores. Metric results indicated the macroinvertebrate community to be *good* condition (Table 4).

Table 3. Results of the habitat assessment conducted on Oakachoy Creek at OAKC-1, May 18, 2010.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	68	Sub-optimal (59-70)
Sediment Deposition	59	Sub-optimal (59-70)
Sinuosity	68	Sub-optimal (65-84)
Bank and Vegetative Stability	66	Sub-optimal (60-74)
Riparian Buffer	64	Marginal (50-69)
Habitat Assessment Score	**156**	
% Maximum Score	**65**	**Sub-optimal (59-70)**

Table 4. Results of the macroinvertebrate bioassessment conducted on Oakachoy Creek at OAKC-1, May 18, 2010.

Macroinvertebrate Assessment	
	Results
Taxa richness and diversity measures	
# Ephemeroptera (mayfly) taxa	11
# Plecoptera (stonefly) taxa	5
# Trichoptera (caddisfly) taxa	6
Taxonomic composition measures	
% Non-insect taxa	8
% Plecoptera	12
% Non-insect organisms	4
Community tolerance	
Becks community tolerance index	21
WMB-I Assessment Score	**74**
WMB-I Assessment Rating	**Good (72-86)**

WATER CHEMISTRY

Results of water chemistry are presented in Table 5. In situ measurements and water samples were collected monthly during April through November of 2010 to help identify any stressors to the biological communities. On May 3rd, turbidity was greater than 50 NTU above background levels for ecoregion 45a, and stream pH exceeded *F&W* use classification criteria. The flow was not measured because flow stage was above normal and the reach was not wadeable. Median specific conductance, alkalinity, and ammonia nitrogen were also higher than background levels.

SUMMARY

Bioassessment results indicated the macroinvertebrate community at OAKC-1 to be in *good* condition. The high turbidity and pH exceedance that occurred on May 3rd, may have been the result of elevated stream flow. Conductivity, alkalinity, and ammonia nitrogen were higher than expected for streams in the Southern Inner Piedmont. Monitoring should continue to ensure that water quality and biological conditions remain stable .

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	E
Physical							
Temperature (°C)	8	14.2	28.7	21.1	21.6	4.8	
Turbidity (NTU)	8	3.5	270.0 T	8.8	44.0	91.9	
Total Dissolved Solids (mg/L)	7	54.0	144.0	66.0	75.4	30.9	
Total Suspended Solids (mg/L)	7 <	1.0	173.0	2.0	27.0	64.4	
Specific Conductance (µmhos)	8	22.6	57.6	55.1 G	50.0	11.7	
Alkalinity (mg/L)	7	4.8	27.1	25.4 M	20.9	8.3	
Stream Flow (cfs)	7	0.8	23.6	6.6	9.0	9.0	
Chemical							
Dissolved Oxygen (mg/L)	8	7.1	9.8	8.2	8.3	1.0	
pH (su)	8	5.6 C	7.3	6.9	6.7	0.5	1
Ammonia Nitrogen (mg/L)	7 <	0.021	< 0.021	0.010 M	0.010	0.000	
J Nitrate+Nitrite Nitrogen (mg/L)	7	0.007	0.137	0.071	0.074	0.046	
Total Kjeldahl Nitrogen (mg/L)	7 <	0.080	0.504	0.328	0.309	0.198	
J Total Nitrogen (mg/L)	7 <	0.135	0.639	0.372	0.383	0.193	
J Dissolved Reactive Phosphorus (mg/L)	7	0.008	0.028	0.021	0.021	0.007	
Total Phosphorus (mg/L)	7	0.025	0.127	0.028	0.045	0.037	
CBOD-5 (mg/L)	7 <	2.0	3.9	1.0	1.4	1.1	
Chlorides (mg/L)	7	0.8	3.0	2.4	2.3	0.7	
Biological							
Chlorophyll a (ug/L)	7 <	0.36	2.67	0.53	1.04	0.84	

C=value exceeds criteria for *F&W* use classification; E=# samples that exceeded criteria; G=value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 45a; J=estimate; M=value >90% of all verified ecoregional reference reach data collected in the ecoregion 45a; N=# samples; T=value exceeds 50 NTU above the 90th percentile of all verified ecoregional reference reach data collected in the ecoregion 45a.

FOR MORE INFORMATION, CONTACT:
Alicia K. Phillips, ADEM Environmental Indicators Section
1350 Coliseum Boulevard Montgomery, AL 36110
(334) 260-2797 akphillips@adem.state.al.us