Alabama Department of Environmental Management

Clean Water Partnership Request

Rivers and Streams Monitoring Program

2008 Monitoring Summary

Fair™

Chewacla Creek at Lee County Road 010 (32.53592/-85.49650)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) monitored biological and water quality conditions in Chewacla Creek at the request of a local citizen monitoring group. The sampling was conducted to monitor any impacts associated with increased discharge from an upstream waste water treatment plant.

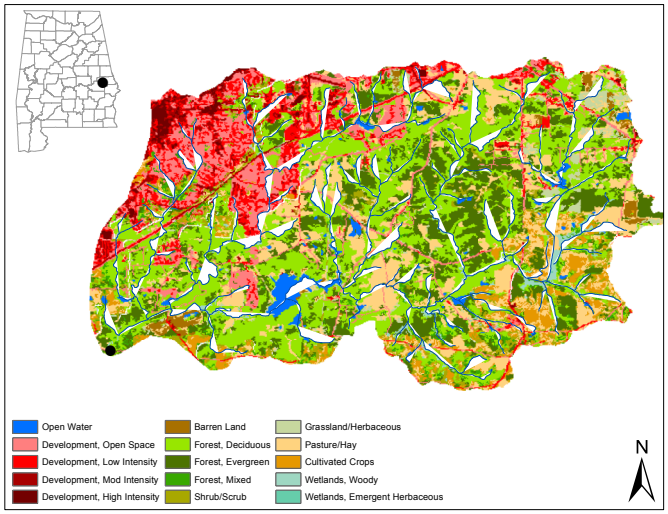

Figure 1. Sampling location and landuse within the Chewacla Creek watershed at CHWL-7.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Chewacla Creek at CHWL-7 is a *Fish & Wildlife (F&W)* stream reach located within the Fall Line Hills ecoregion in Lee County. CHWL-7 is located approximately 1.5 miles downstream of Chewacla Creek near Moores Mill Creek (CHWL-4), which was also sampled by ADEM in 2008. Based on the 2000 National Land Cover Dataset, landuse within the watershed is composed of forest (48%), pasture/hay, and development (21%) (Figure 1). As of February 23, 2011, ADEM's NPDES Management System database shows 331 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. Chewacla Creek at CHWL-7 is a high-gradient stream. Instream substrates were dominated by cobble and gravel. Habitat quality and availability within the reach were rated *optimal* for supporting macroinvertebrate communities.

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 the average of all individual metric scores. Metric results indicated the macroinvertebrate community to be characterized by pollution-tolerant taxa groups, indicating *fair* community condition (Table 4).

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Tallapoosa River
Drainage Area (mi²)		53
Ecoregion[a]		65i
% Landuse		
Open water		2
Wetland	Woody	1
	Emergent herbaceous	<1
Forest	Deciduous	31
	Evergreen	15
	Mixed	2
Shrub/scrub		4
Grassland/herbaceous		3
Pasture/hay		15
Cultivated crops		4
Development	Open space	11
	Low intensity	7
	Moderate intensity	2
	High intensity	1
Barren		1
Population/km²[b]		182
# NPDES Permits[c]	**TOTAL**	331
401 Water Quality Certification		5
Construction Stormwater		312
Mining		2
Industrial General		7
Municipal Individual		2
Underground Injection Control		3

a. Fall Line Hills
b. 2000 US Census
c. #NPDES permits downloaded from ADEM's NPDES Management System database, February 23, 2011

Table 2. Physical characteristics of Chewacla Creek at CHWL-7, June 19, 2008.

Physical Characteristics		
Width (ft)		30
Canopy Cover		Mostly Open
Depth (ft)		
	Riffle	0.3
	Run	0.5
	Pool	1.5
% of Reach		
	Riffle	20
	Run	20
	Pool	60
% Substrate		
	Boulder	5
	Cobble	40
	Gravel	32
	Sand	10
	Silt	10
	Organic Matter	3

TM Graphics provided by Florida Dept. of Environmental Protection (FDEP); used with permission

Table 3. Results of the habitat assessment conducted on Chewacla Creek at CHWL-7, June 19, 2008.

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	72	Optimal >65
Sediment Deposition	65	Sub-optimal (53-65)
Sinuosity	80	Sub-optimal (65-84)
Bank and Vegetative Stability	59	Marginal (35-59)
Riparian Buffer	71	Sub-optimal (70-89)
Habitat Assessment Score	**160**	
% Maximum Score	**66**	**Optimal >65**

Table 4. Results of the macroinvertebrate bioassessment conducted in Chewacla Creek at CHWL-7, June 19, 2008.

Macroinvertebrate Assessment			
	Results	**Scores (0-100)**	**Rating**
Taxa richness measures			
# Ephemeroptera (mayfly) genera	13	100	Excellent (>85)
# Plecoptera (stonefly) genera	0	0	Very Poor (<16)
# Trichoptera (caddisfly) genera	10	83	Excellent (>83)
Taxonomic composition measures			
% Non-insect taxa	14	43	Poor (24.7-49.4)
% Non-insect organisms	2	95	Good (94-97)
% Plecoptera	0	0	Very Poor (<6.56)
Tolerance measures			
Beck's community tolerance index	11	39	Poor (20.2-40.9)
WMB-I Assessment Score	**--**	**51**	**Fair (49-72)**

Table 5. Summary of water quality data collected June 19, 2008. Average (Avg) values were calculated by multiplying the MDL by 0.5 when results were less than this value.

Parameter	N	Avg
Physical		
Temperature (°C)	1	23.2
Turbidity (NTU)	1	5.7
Total Dissolved Solids (mg/L)	1	120.0
Total Suspended Solids (mg/L)	1	5.0
Specific Conductance (µmhos)	1	322.0 G
Alkalinity (mg/L)	1	69.1
Stream Flow (cfs)	1	8.8
Chemical		
Dissolved Oxygen (mg/L)	1	7.0
pH (su)	1	7.5
Ammonia Nitrogen (mg/L)	1	< 0.015
Nitrate+Nitrite Nitrogen (mg/L)	1	5.640
Total Kjeldahl Nitrogen (mg/L)	1	0.629
Total Nitrogen (mg/L)	1	6.269
Dissolved Reactive Phosphorus (mg/L)	1	0.025
Total Phosphorus (mg/L)	1	0.048
CBOD-5 (mg/L)	1	< 1.0
Chlorides (mg/L)	1	15.4

N=# samples; G=value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 65i.

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected June 19, 2008 for a Clean Water Partnership request to help identify any stressors to the biological communities. Specific conductance was higher than expected for ecoregion 65i.

SUMMARY

Overall habitat quality was categorized as *optimal*. With the exception of specific conductance, physical and chemical parameters were typical of streams in the Fall Line Hills ecoregion, and bioassessment results indicated the macroinvertebrate community to be in *fair* condition.

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